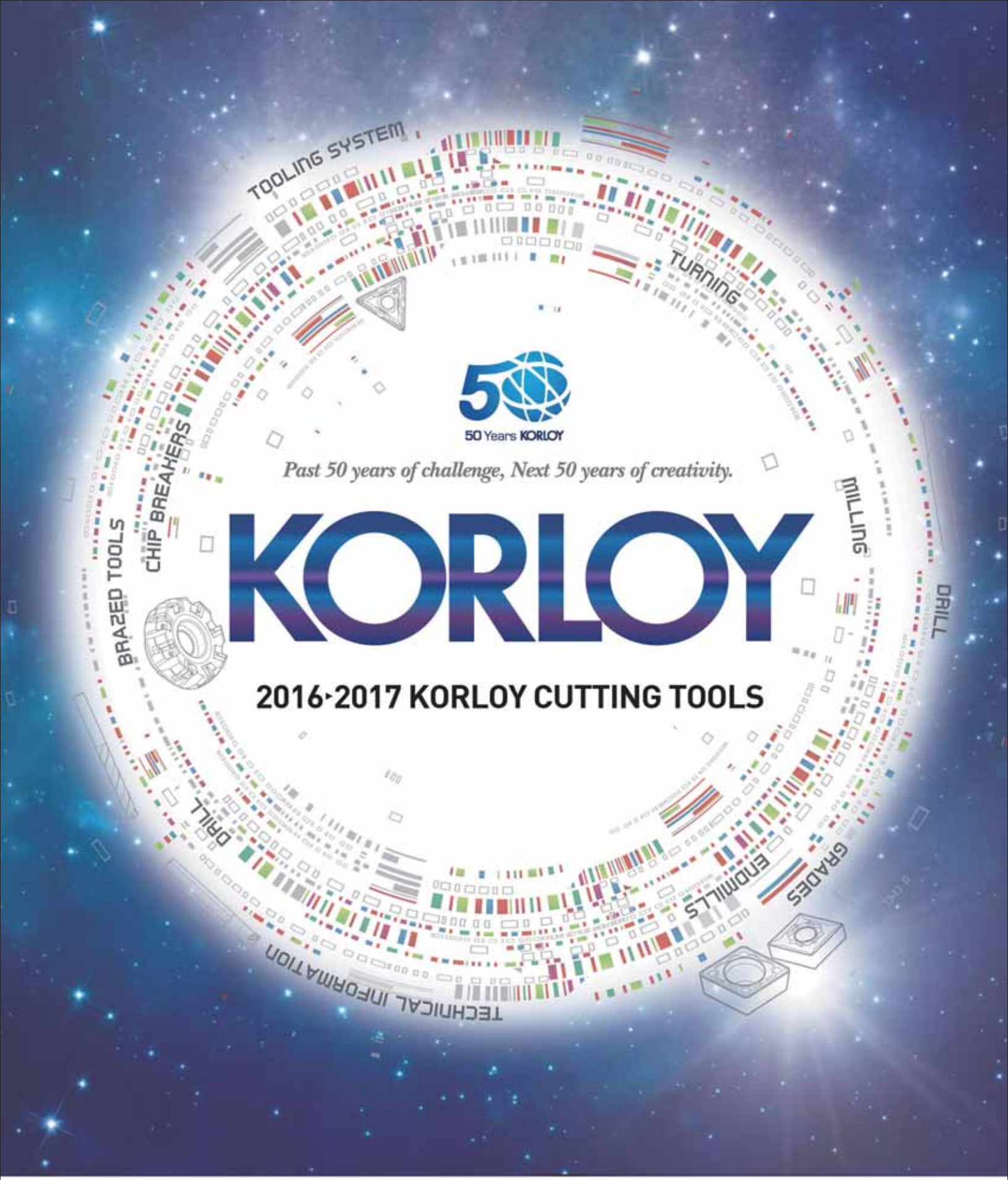

50th Anniversary Since 1966

KORLOY

50 Years KORLOY

Past 50 years of challenge, Next 50 years of creativity.

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M Old-fashioned product information

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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products

- It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
- KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products. There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of Tungsten(W), Titanium(Ti), Alluninyum(Al), Silicon(Si), Tantalum(Ta), Boron(B) etc and metal omponent like Cobalt(Co), Nickel(Ni), Chrom(Cr), Molybdenum(Mo) as binder. Cemented carbides tools have high hardness and specific gravity.
Generally there's no smell but according to usage and treatment, appreance and color could be changed

3. Precaution for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard and brittle at the same time.
   Impact shock or excessive clamping power could cause fracture or breaking of the tool.
2) Cemented carbides have large sepcific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremly high or low temperatures.
4) There are several cemented carbide products having sharp cutting edges.
   Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
6) Please refer to the catalouge safety guidance prior to handling the tools.
7) Do not absue tools under inappropriate conditions.

4. Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

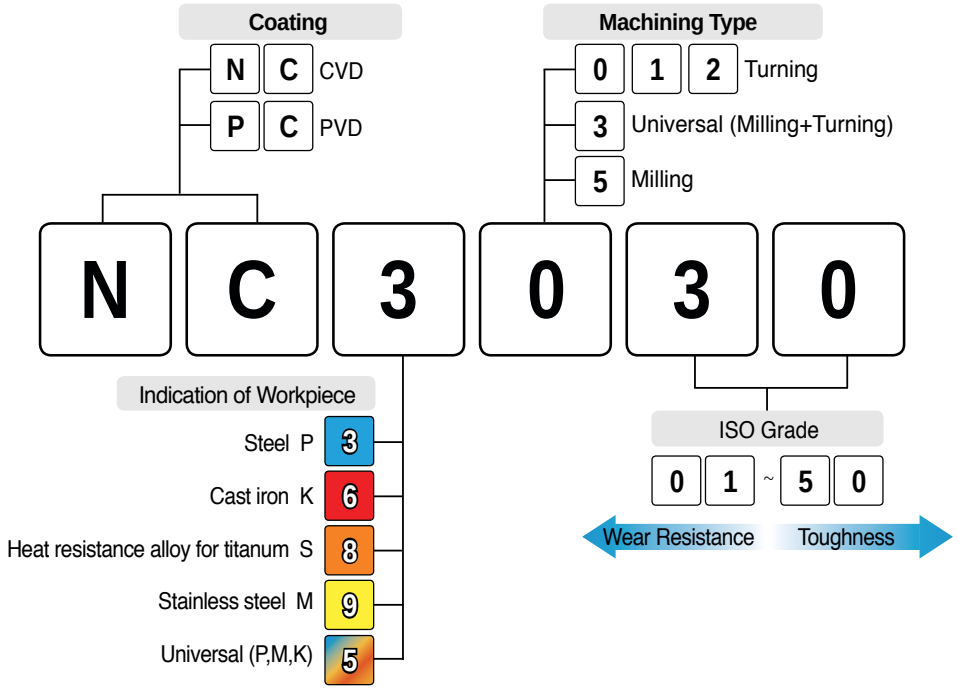
1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Cobalt(Co), thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immeditely with continously running water.
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
4) Check for cracks after re-grinding carbide tool and reuse.
5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shortened tool life.
6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary , remove the crack with a grinding process.
7) Brazing of carbide tools at extremly high or low temperatures compare with the melting point of brazing materials may cause loosening or breakage.
8) Overheating a oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

5. METALCUTTING SAFETY

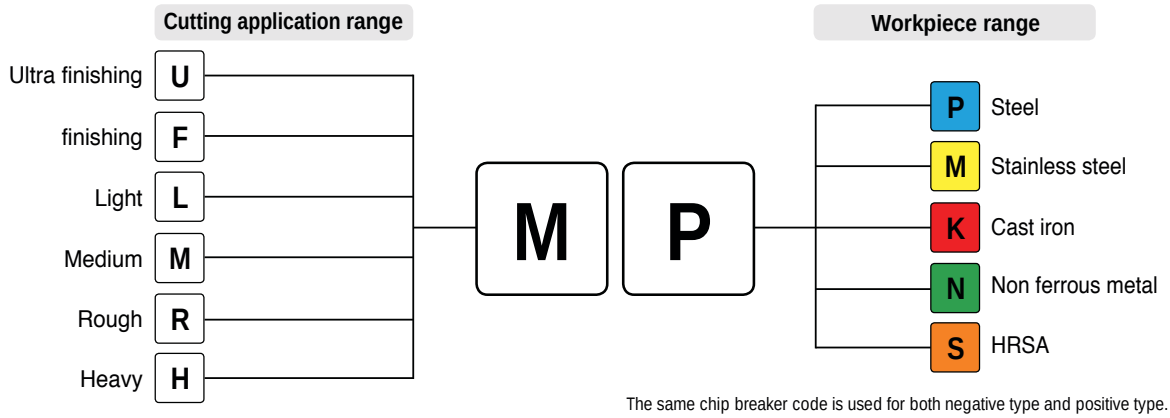
	DANGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	· Sharp cutting edge of cutting tools may cut your bare-hand	· Use gloves when pulling out the insert from the case or mounting it on the machine
	· Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury	· Use glasses or safety cover for your safety · Use the tools within the recommended range · Please refer to catalogue and safety guidelines first.
	· Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury	· Use glasses or safety cover for your safety · Change the tool as required before excessive wear or fracture
	· Chips evacuated during cutting are hot and sharp and may cause burns and cuts	· Use glasses or safety cover for your safety · Stop machining and put safety glove on and use a hook tool to remove chips
	· Touching the workpiece immediately after cutting may cause burns	· Use gloves or safety cover for your safety
	· Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation	· Do not use at the place where having explosive materials · Prepare for fire extinguishments
	· In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine	· Use glasses or safety cover for your safety · Check first if there's any chattering, vibration or strange noises prior to your main cutting operation
	· Touching a burr remaining on the workpiece with a bare-hand may cause a cut	· Do not touch the burr with bare-hand · Use gloves or safety cover for your safety
	· Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury	· Clamp the workpiece tightly
	· Tools are operated to right-hand direction normally. Left-hand direction operation can cause fracture of tool and body damage	· Do not use left-hand direction without notice · Check the package of product to check the availability of left-hand operation
Indexable tools	· Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury	· Check the clamping of inserts and parts prior to machining, and use original parts only
	· Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts	· Do not use lever inappropriately
	· In case of high speed machining, parts and inserts can be forced out by centrifugal force	· Use within recommended condition · Use glasses or safety cover for your safety
Rotating tools	· Since cutter has sharp cutting edges touching with a bare-hand may cause a cut	· Use gloves or safety cover for your safety
	· It is dangerous to use glove with rotating machine · Contact with body or clothes is dangerous with rotating parts	· Do not wear gloves when you work with rotating machine · Keep your body and clothes away from rotating machine
	· Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury	· RPM should be controled within recommended condition · Check the balance of rotating part periodically
	· In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury	· Use gloves or safety cover for your safety
	· The edges of small diameter drill are sharp and easy to break	· Use gloves or safety cover for your safety
Brazed tools	· Fragmentation and ejection of brazed carbide tip may cause injury	· Check the brazed tip before using. · Do not use at high temperature cutting condition
ETC	· There's a possibility of breaking the carbide tip after several brazing	· Do not use brazing a tip that has been brazed several times
	· Abusing may cause fragmentation of tool and is very dangerous.	· Stick to safety regulations and guidelines

KORLOY Inc. Code System

Grade Name for Coated Carbide



Chip Breaker



The same chip breaker code is used for both negative type and positive type.

Terminology of tool formula

TERM	CODE	UNIT
Tool diameter	D	mm
Cutting speed	vc	m/min
Revolution per minute	n	min^{-1}
Feed per minute	vf	mm/min
Feed per revolution	fn	mm/rev
Feed per tooth	fz	mm/t
Tooth	z	
Axial depth of cut	ap	mm
Radial depth of cut	ae	mm
Peak feed	pf	mm

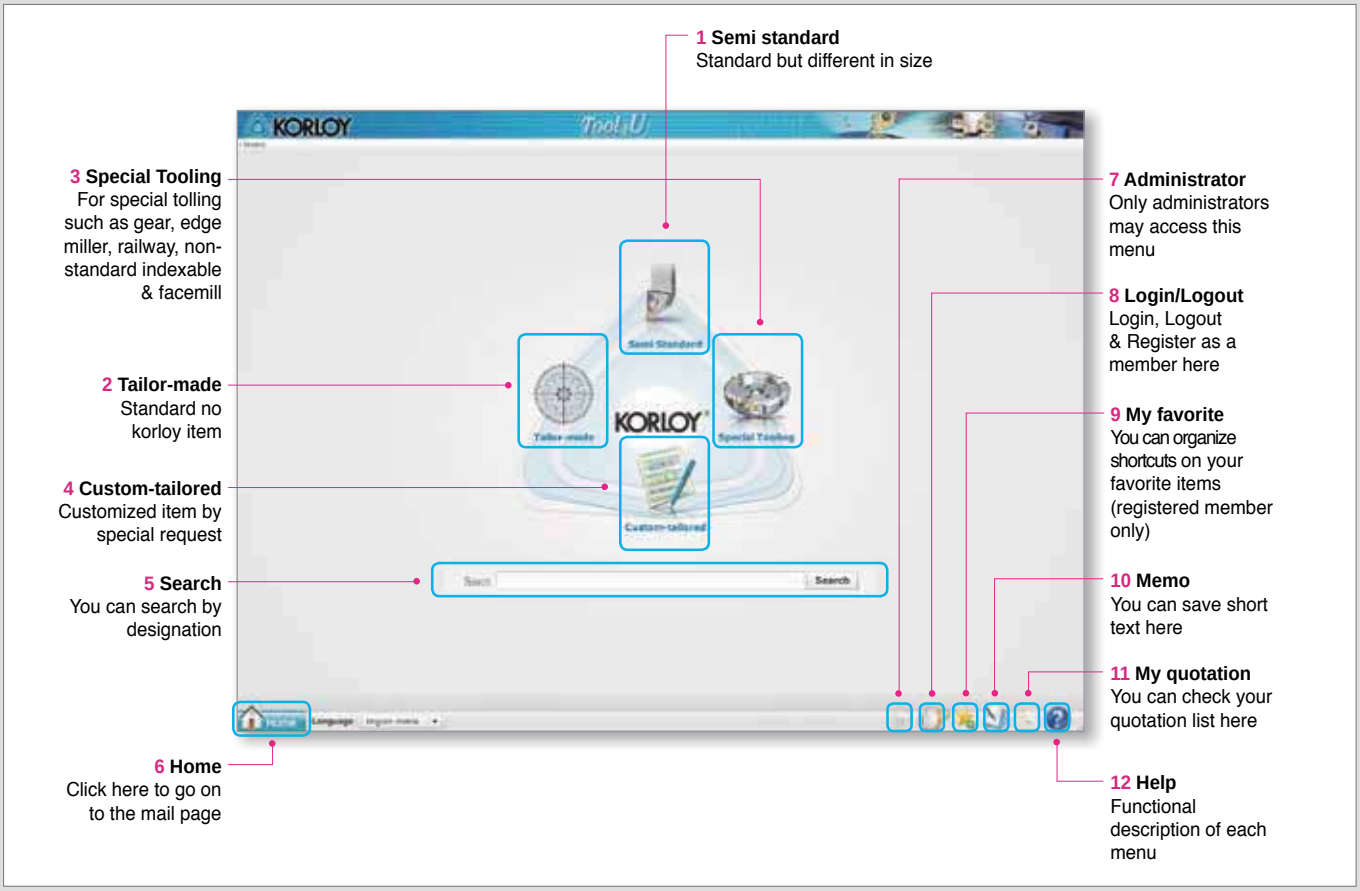
TERM	CODE	UNIT
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa
Torque	Mc	N.m
Thrust	Tc	N
Cycle time	tc	min
Tool life	T	min
Flank wear	V_B	mm
Crater wear	Kt	mm
Nose radius	r	mm

How to use Tool4U (Web quotation requriement)

1 **Contact with Korloy Homepage**
http://www.korloy.com (Korloy homepage)

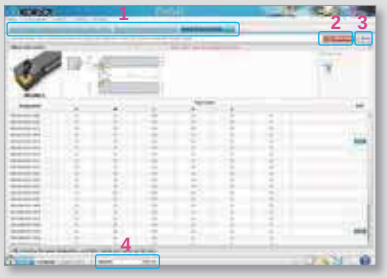
2 **Click** Tool4U **banner-icon on the web site**

3 **Main page**



3 **Screen shot**

- **Screen shot 1 : step3. Product detail**



1. Step : Select category, product and check product detail
2. Next step : Open new window for changing dimension
3. Print : Print current page
4. Search : Search product by designation

- **Screen shot 2 : Size input page**

Enter essential information needed to quote and click “Quote” button to send e-mail

A

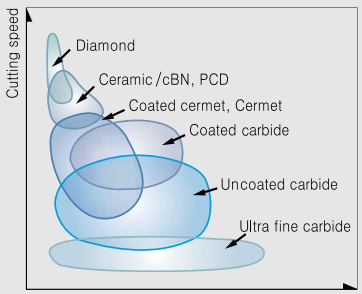
GRADES & CHIP BREAKERS

Korloys new grades are designed with optimal substrates for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high tempeure and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity.

Grades system

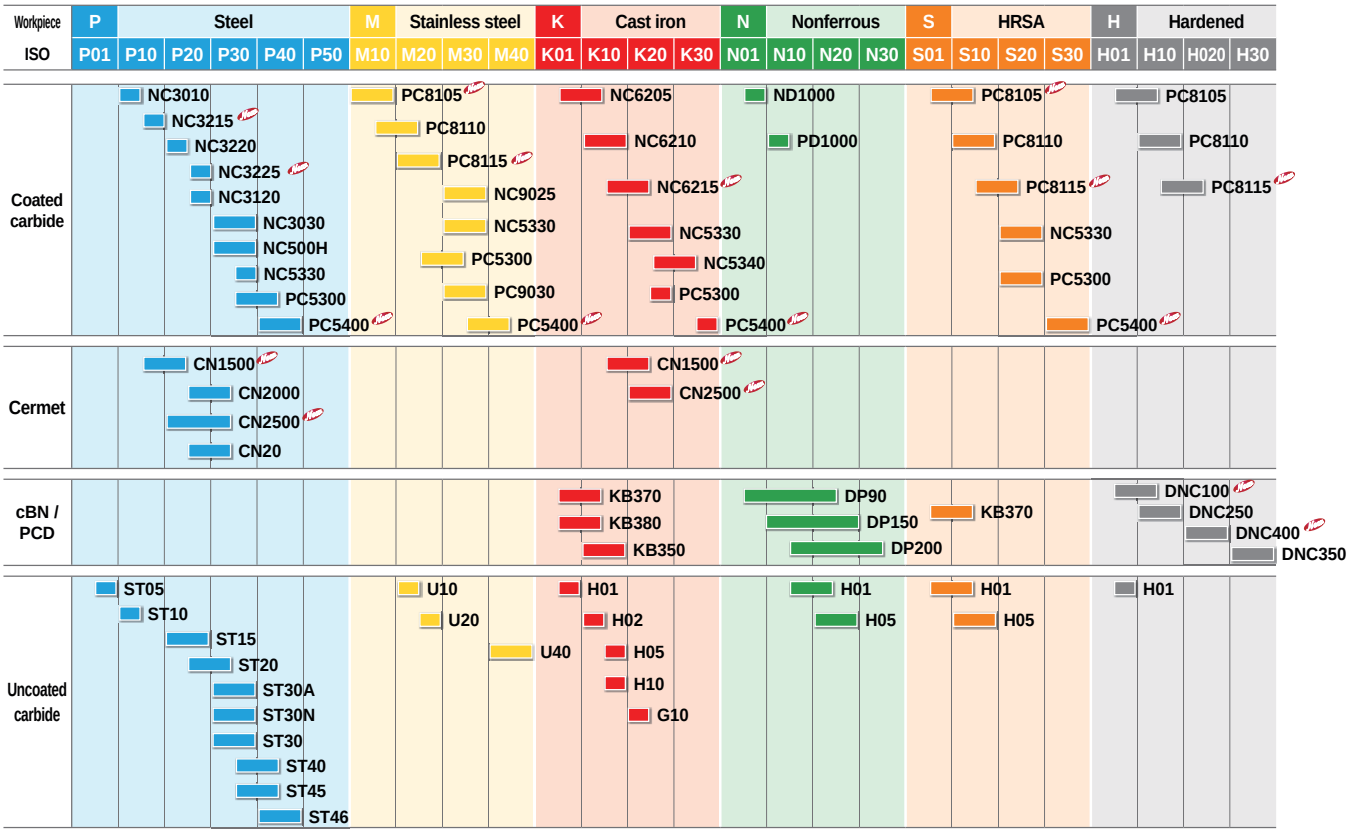
Cutting Tool	Uncoated carbide	P	Steel	ST05	ST10	ST15	ST20	ST30A	ST30N	ST30	ST40	ST45	ST46
		M	Stainless steel	U10	U20	ST30A	U40						
		K	Cast iron	H01	H02	H05	H10	G10					
		S	Titanium alloy	H01	H05								
		N	Non-ferrous metal	H01	H05								
		H	Hardened steel	H01									
	Coated carbide for turning	P	Steel	NC3010	NC3215	NC3220	NC3225	NC3120	NC3030	NC5330	NC5340	NC5350	NC500H
		M	Stainless steel	PC8105	PC8110	PC8115	NC9025	NC5330	NC5340	NC5350	PC5300	PC9030	PC5400
		K	Cast iron	NC6205	NC6210	NC6215	NC315K	NC5330	NC5340	PC5300	PC5400		
		S	HRSA	PC8105	PC8110	PC8115	NC5330	PC5300	PC5400				
		N	Non-ferrous metal	ND1000	PD1000								
		H	Hardened steel	PC8105	PC8110	PC8115							
	Coated carbide for milling	P	Steel	NC5330	NC5340	NCM325	PC3500	PC3600	PC5300	PC5400	NC5350	NCM335	PC3545
		M	Stainless steel	NC5330	NC5340	NCM325	PC5300	PC9530	NC5350	NCM335	PC5400		
		K	Cast iron	PC8110	PC6510	NC5330	PC5300	NC5340	PC5400				
		S	HRSA	PC5300	PC5400								
		N	Non-ferrous metal	ND2000	PD2000								
		H	Hardened steel	PC2005	PC2010	PC2015	PC210F						
	Coated carbide for Drills, Endmills	P	Steel	PC3500	PC5300	PC5335	PC5400	NC5335					
		M	Stainless steel	PC5300	PC5335	PC5400							
		K	Cast iron	PC6510	PC5300								
		S	HRSA	PC5300	PC5400								
		N	Non-ferrous metal	H05									
	Turning Cermet	P	Steel	CN1500	CN2500	CN20	CN30						
		K	Cast iron	CN1500	CN2500								
	Coated cermet	P	Steel	CC1500	CC2500	CC125							
	Milling Cermet	P	Steel	CN2000	CN20	CN30							
	Solid Endmills	P M K	General	PC203F	PC210F	PC215F	PC220	PC221F	PC303S	PC310U	PC315E	PC320	PC325	FA2
		S	HRSA	PC210	PC220	PC320	PC325						
		H	Hardened steel	PC203F	PC303S	PC310U							
		N	Non-ferrous metal	ND3000	PD3000	PC210C	H01	H05S	FA2				
	Solid Drills	P M K	General	PC205F	PC325U	PC215G	PC315G	PC230F					
		N	Non-ferrous metal	FG2									
	cBN	K	Cast iron	KB410	KB350	KB370							
		S	HRSA	KB370									
		H	Hardened steel	KB420	KB420	KB425	KB1000	KB2000	KB320	KB335	KB370		
	Coated cBN	H	Hardened steel	DNC100	DNC250	DNC350	DNC400						
	PCD	N	Non-ferrous metal	DP90	DP150	DP200							
Wear resistance Tool	Ultra fine grain cemented carbide	Z	Ultra fine grain cemented carbide	FS1	FA1	FCC							
	Uncoated carbide	V	Wear parts	D1	D2	D3	G5	G6	K20G				
		I	Corrosion resistance	IN10	IN20	IN40							
Mining Tool	Uncoated carbide	E	General	GR10	GR20	GR30	GR35	GR40	GR50				

Application range

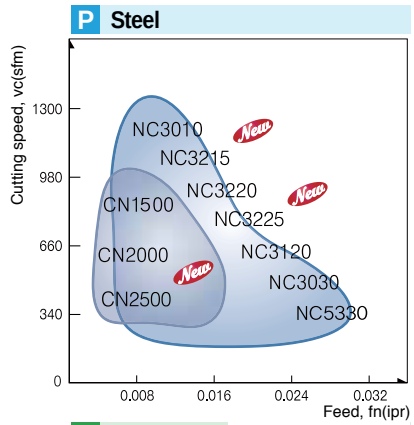


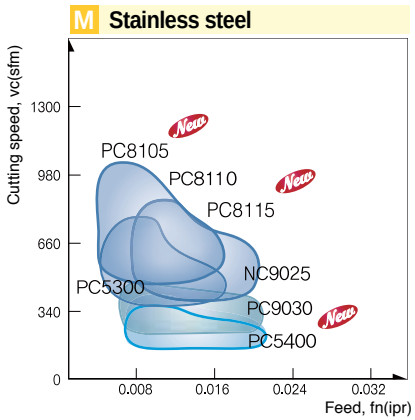
The best way to choose KORLOY turning inserts

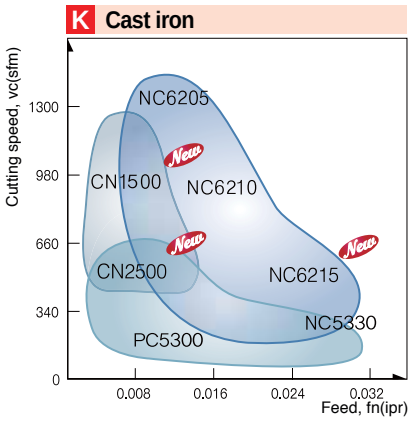
Selection system

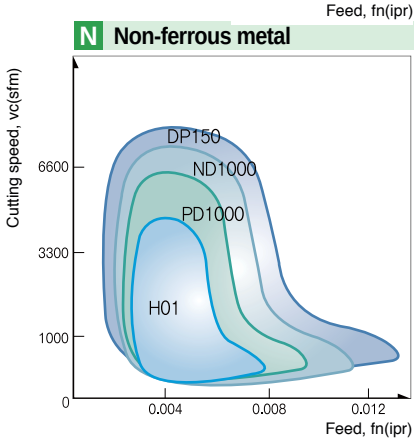


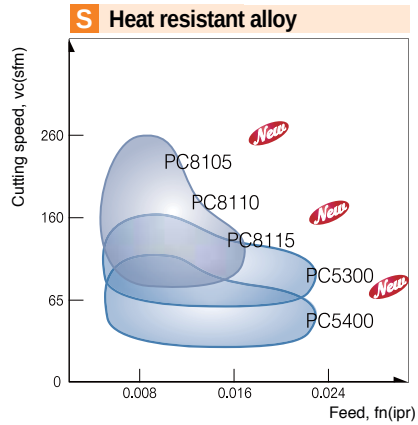
Application range of turning grades

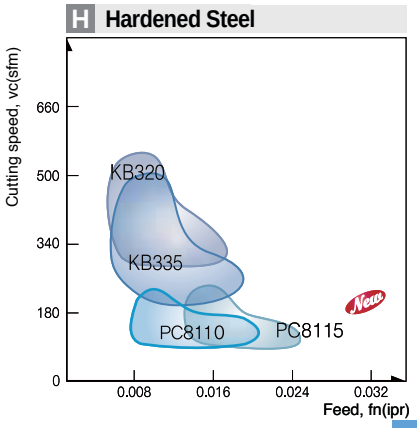












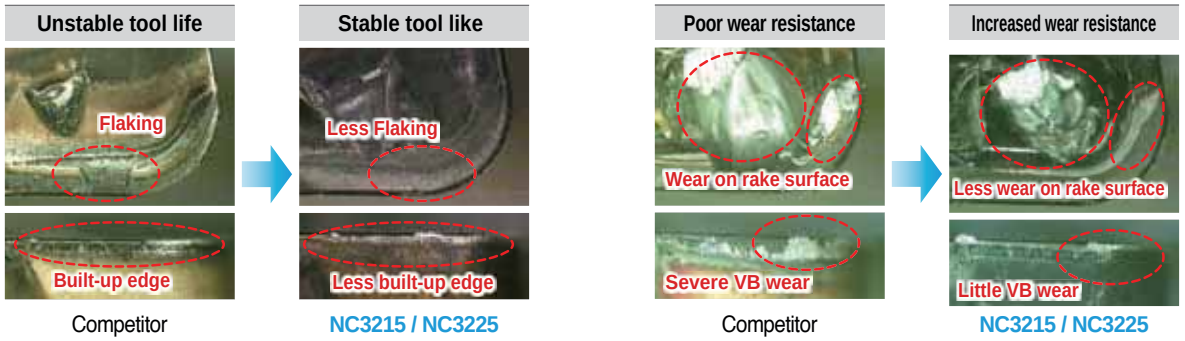
CVD coated Grades

Grade for all applications of steel

NC3215 New / NC3225 New

- Universal grade especially for machining forged automobile components and bearing steel both in continuous and interrupted cutting
- Available for all kinds of steels - carbon steel, alloy steel, rolled steel, tool steel, mild steel, bearing steel and other special kinds of steel
- New coating technology increases welding resistance and chipping resistance, which leads to longer tool life.

Features



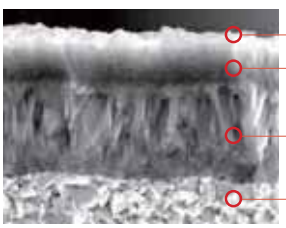
▶ Disperse cutting force → Reduce chipping → Increase tool life → **Improved productivity**

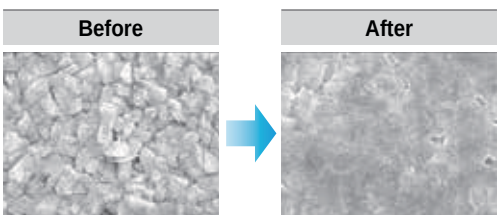
Grade for all applications of steel

NC3220

- NC 3220 covers a wide application range for all kinds of steels (carbon steel, alloy steel, forged steel, rolled steel, tool steel, mild steel, bearing steel and other special steels) in both continuous and interrupted machining
- Improved surface roughness and lower cutting force ensure better lubrication and wear resistance on rake surface.

Features





New technology of surface treatment improves welding resistance and stability in machining.

CVD coated Grades

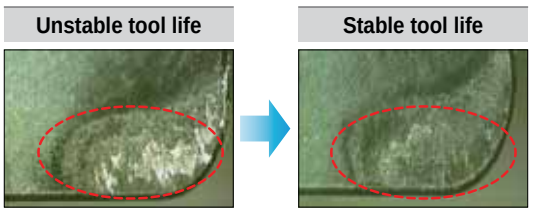
Universal grade for cast iron

NC6215 New

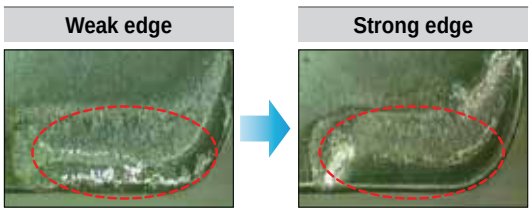
- Universal grade for machining cast iron in continuous/interrupted cutting including gray cast iron(GC) and ductile cast iron(GCD)
- New coating technology increases welding resistance and chipping resistance, which leads to longer tool life.

Features

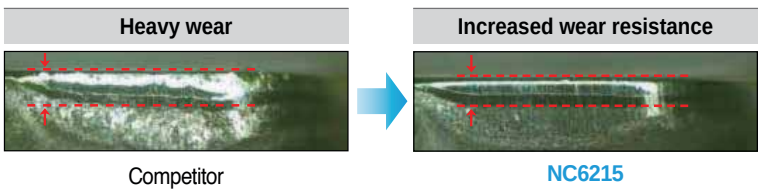
▶ Flaking occurs at competitor's in interrupted machining of cast iron.
-> KORLOY's new coating technology
ensures better flaking resistance



▶ Damage on blade occurs at competitor's in interrupted machining of cast iron.
-> KORLOY's high toughness substrate(K15)
ensures stronger cutting edge



▶ Heavy wear occurs at competitor's in continuous / interrupted machining of cast iron at high feed.
-> KORLOY's new chip breaker 'VR' for high feed machining increases wear resistance.

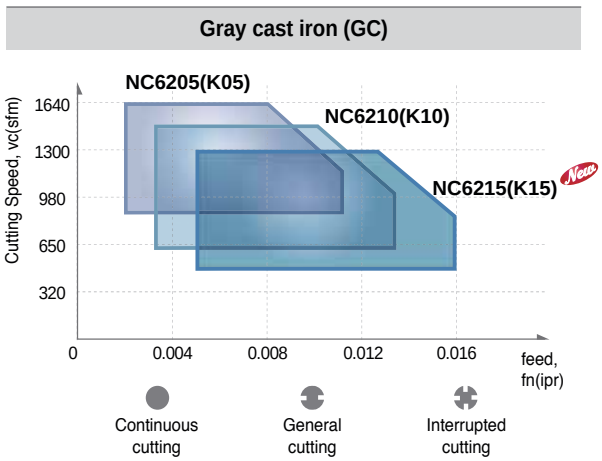


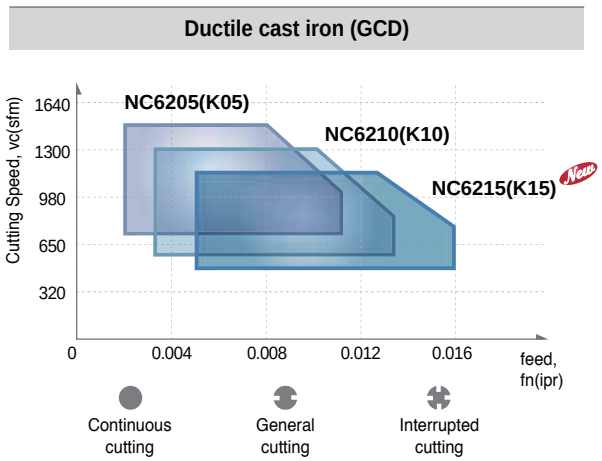
Turning grade for cast iron

NC6205 / NC6210

- NC6205 - Superior cutting performance in continuous and high speed machining
- NC6210 - Stable tool life in continuous and interrupted turning

Recommended cutting conditions and grade line-up





Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	NC3010	968 (558 ~ 1378)	P05	NC3010
			NC3215 New	968 (558 ~ 1378)	P10	NC3215 New
			NC3220	853 (492 ~ 1214)	P15	NC3220
		Interrupted cutting	NC3225 New	853 (492 ~ 1214)	P20	NC3225 New
			NC3120	853 (394 ~ 1214)	P25	NC3120
			NC3030	673 (394 ~ 951)	P30	NC3030
			NC5330	673 (394 ~ 951)	P35	NC5330
			NC500H	673 (394 ~ 951)	P40	NC500H
M	Stainless steel	Continuous cutting	NC9025	787 (492 ~ 1083)	M20	
		Interrupted cutting			M30	NC9025 NC5330
					M40	
K	Cast iron	Continuous cutting	NC6205	1033 (591 ~ 1083)	K01	NC6205
			NC6210	820 (427 ~ 1214)	K10	NC6210
		Interrupted cutting	NC6215 New	722 (427 ~ 1017)	K20	NC6215 New NC5330
			NC5330	623 (361 ~ 886)	K30	
S	HRSA	Continuous cutting	NC5330	131 (66 ~ 197)	S10	
		Interrupted cutting			S20	NC5330

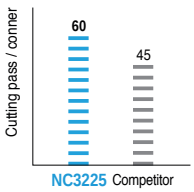
The features of CVD turning grades

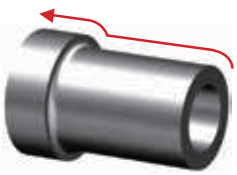
CVD Coated grades	ISO	Features
NC3010	P05 ~ P10	• High speed cutting for steel • Combining excellent wear resistance substrate with chipping and heat resistance Al_2O_3 increased stability • MT-TiCN + Al_2O_3 + TiN
NC3215 New	P10 ~ P15	• Continuous machining of general steel and forged steel at high speed • Substrate with excellent thermal crack /plastic deformation resistance, coating with improved chipping resistance for continuous machining • MT-TiCN + Al_2O_3 + TiN
NC3220	P15 ~ P20	• Medium to high speed machining of steel • Universal grade combining substrate with wear resistance and toughness and Al_2O_3 coating with oxidation resistance and fracture resistance • Special treatment on the outermost layer • MT-TiCN + Al_2O_3 + TiN
NC3225 New	P20 ~ P25	• Universal grade for general steel and forged steel • 1st recommended grade for general machining with the use of high toughness substrate and coating layer with improved welding/chipping resistance • MT-TiCN + Al_2O_3 + TiN
NC3120	P20 ~ P25	• Medium to roughing for steel • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + TiC + Al_2O_3
NC3030	P25 ~ P35	• Medium to low speed machining of steel and interrupted roughing • Harmony between substrate with excellent wear/fracture resistance and Al_2O_3 film with excellent thermal / chipping resistance • Increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC5330	P30 ~ P35 M25 ~ M35 K15 ~ K25 S15 ~ S25	• Stainless Steel/General Cutting for Mild Steel & Forging Steel • MT-TiCN + Al_2O_3 + TiN
NC9025	M25 ~ M35	• Stainless Steel/General Cutting for Mild Steel & Forging Steel • MT-TiCN + Al_2O_3 + TiN
NC500H	P25 ~ P35	• Heavy interrupted cutting for steel • Plastic deformation and fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC6205	K01 ~ K10	• General cutting for gray cast iron and ductile cast iron • High hardness substrate and improved adhesion of thick Al_2O_3 show superior wear resistance • MT-TiCN + Al_2O_3
NC6210	K05 ~ K15	• General cutting for gray cast iron and ductile cast iron • Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance • MT-TiCN + Al_2O_3
NC6215 New	K10 ~ K20	• Universal grade for gray cast iron and ductile cast iron • High toughness substrate and adhesive Al_2O_3 coating layer ensure excellent cutting performance. • MT-TiCN + Al_2O_3

Cutting performance (NC3215 / NC3225)

P Alloy Steel (4320, molding)

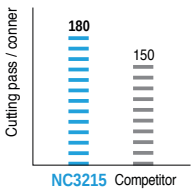
- **Workpiece** Part for engine
- **Cutting condition** vc(sfm) = 328
  fn(ipr) = 0.006
  ap(inch) = 0.118
  wet
- **Designation** **INSERT** CNMG432-MP(NC3225)
  HOLDER PCLNR16-4D
- **Test result**





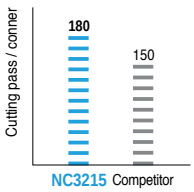
P Carbon Steel (1020)

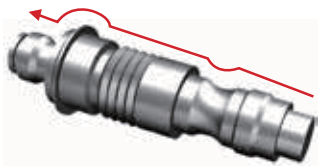
- **Workpiece** Part for fuel system
- **Cutting condition** vc(sfm) = 820~1247
  fn(ipr) = 0.008~0.012
  ap(inch) = 0.059~0.079
  wet
- **Designation** **INSERT** CNMG433-MP(NC3215)
  HOLDER PCLNL16-4D
- **Test result**



P Carbon Steel (1039, cold forging)

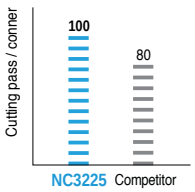
- **Workpiece** Part for steering
- **Cutting condition** vc(sfm) = 558
  fn(ipr) = 0.012
  ap(inch) = 0.106~0.118
  wet
- **Designation** **INSERT** DNMG432-MP(NC3215)
  HOLDER DDJNL16-4D
- **Test result**





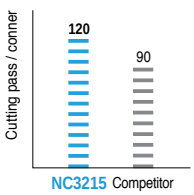
P Carbon Steel (1055, hot forging)

- **Workpiece** Part for steering
- **Cutting condition** vc(sfm) = 755
  fn(ipr) = 0.012
  ap(inch) = 0.020~0.059
  wet
- **Designation** **INSERT** CNMG432-MP(NC3225)
  HOLDER PCLNL16-4D
- **Test result**



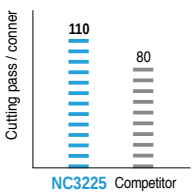
P Carbon Steel (1045, cold forging)

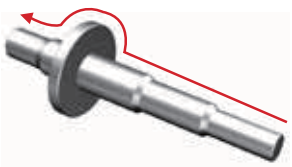
- **Workpiece** Part for steering
- **Cutting condition** vc(sfm) = 656~820
  fn(ipr) = 0.010~0.014
  ap(inch) = 0.039~0.079
  wet
- **Designation** **INSERT** DNMG443-LP(NC3215)
  HOLDER DDJNL16-4D
- **Test result**



P Alloy Steel (5120, cold forging)

- **Workpiece** Part for mission
- **Cutting condition** vc(sfm) = 525
  fn(ipr) = 0.005
  ap(inch) = 0.039
  wet
- **Designation** **INSERT** DNMG442-LP(NC3225)
  HOLDER DDJNL16-4D
- **Test result**

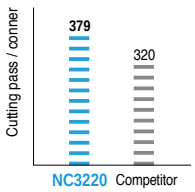


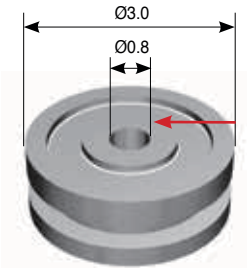


Cutting performance (NC3220)

P Alloy Steel (5120H, hot forging)

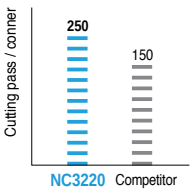
- **Cutting condition** vc(sfm) = 1,180~1,410
  fn(ipr) = 0.008
  ap(inch) = 0.048~0.06
  (external machining / facing)
  wet
- **Designation** **INSERT** CNMG432-VC
  HOLDER PCLNR16-4D
- **Test result**

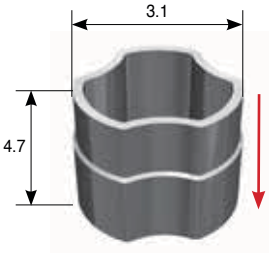




P Carbon Steel(1040, cold forging)

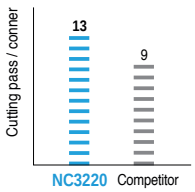
- **Cutting condition** vc(sfm) = 918
  fn(ipr) = 0.008~0.010
  ap(inch) = 0.04
  dry
- **Designation** **INSERT** CNMG433-VC
  HOLDER PCLNR16-4D
- **Test result**

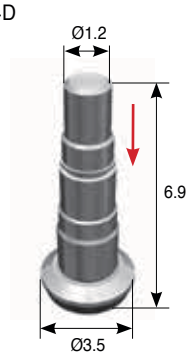




P Alloy Steel (4130H, hot forging)

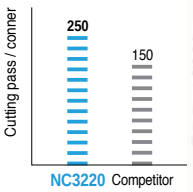
- **Cutting condition** vc(sfm) = 262~1,640
  fn(ipr) = 0.006~0.012
  (External machining / facing / grooving / tapping)
  ap(inch) = 0.028~0.006
  wet
- **Designation** **INSERT** DNMG442-VC
  HOLDER PDJNR16-4D
- **Test result**

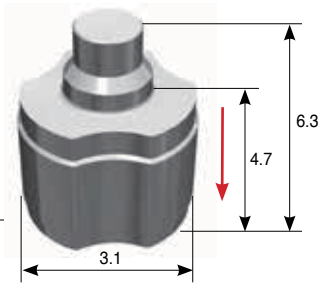




P Carbon Steel(1053, cold forging)

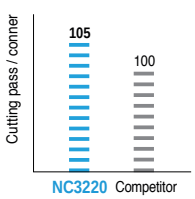
- **Cutting condition** vc(sfm) = 918
  fn(ipr) = 0.008~0.010
  (External machining / internal machining)
  ap(inch) = 0.04
  dry
- **Designation** **INSERT** DNMG442-VC
  HOLDER PDJNR16-4D
- **Test result**

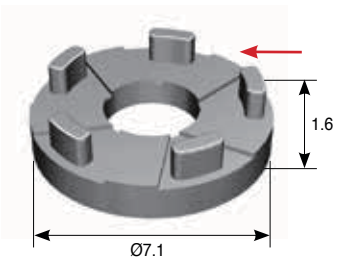




P Alloy Steel (SCR series, cold forging)

- **Cutting condition** vc(sfm) = 1,030
  fn(ipr) = 0.010
  (external machining / facing)
  ap(inch) = 0.04
  wet
- **Designation** **INSERT** CNMG432-VM
  HOLDER PCLNR16-4D
- **Test result**

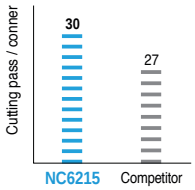




Cutting performance (NC6215)

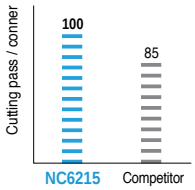
K Ductile cast iron (80-55-06)

- **Workpiece** Diff. case (Ø6.1)
- **Cutting condition** vc(sfm) = 1,148 ~ 1,903
  fn(ipr) = 0.008 ~ 0.012
  ap(inch) = 0.059 ~ 0.098
  wet
- **Designation** **INSERT** WNMG433-VR(NC6215)
  HOLDER Special holder
- **Test result**



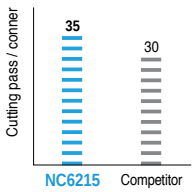
K Ductile cast iron (80-55-06)

- **Workpiece** Diff. case (Ø5.3)
- **Cutting condition** vc(sfm) = 1,837
  fn(ipr) = 0.003 ~ 0.008
  ap(inch) = 0.059 ~ 0.098
  wet
- **Designation** **INSERT** WNMG433-B25(NC6215)
  HOLDER Special holder
- **Test result**



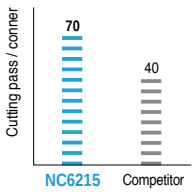
K Gray cast iron (No35B)

- **Workpiece** Break disc (Ø10.6)
- **Cutting condition** vc(sfm) = 1,804
  fn(ipr) = 0.012
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** CNMG433-VR(NC6215)
  HOLDER PCLNR16-4D
- **Test result**



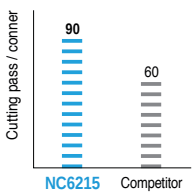
K Ductile cast iron (80-55-06)

- **Workpiece** Pulley (Ø8.3)
- **Cutting condition** vc(sfm) = 984
  fn(ipr) = 0.008
  ap(inch) = 0.047
  wet
- **Designation** **INSERT** WNMG432-VR(NC6215)
  HOLDER Special holder
- **Test result**



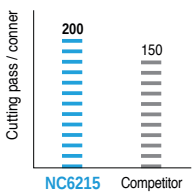
K Ductile cast iron (80-55-06)

- **Workpiece** Crank shaft (Ø2.7)
- **Cutting condition** vc(sfm) = 984
  fn(ipr) = 0.008 ~ 0.012
  ap(inch) = 0.118
  wet
- **Designation** **INSERT** DNMG433-VR(NC6215)
  HOLDER Special holder
- **Test result**



K Ductile cast iron (60-40-18)

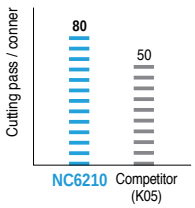
- **Workpiece** Oil pump housing (Ø9.1)
- **Cutting condition** vc(sfm) = 720
  fn(ipr) = 0.010
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** CNMG433-VR(NC6215)
  HOLDER DCLNR16-4D
- **Test result**

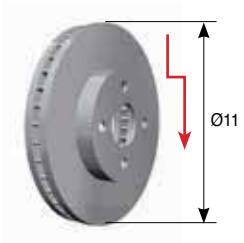


Cutting performance (NC6205 / NC6210)

K Gray cast iron(No 35 B), Blake Disc

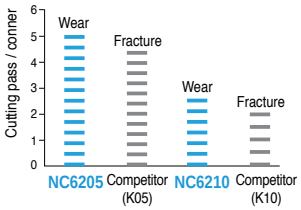
- **Cutting condition** vc(sfm) = 1,287
  fn(ipr) = 0.010
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** CNMG433-VK(NC6210)
  HOLDER PCLNR16-4D
- **Test result**

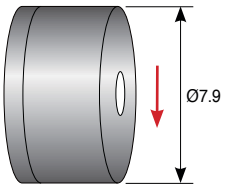




K Ductile cast iron, in interrupted machining

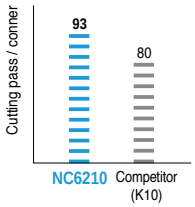
- **Cutting condition** vc(sfm) = 396
  fn(ipr) = 0.012
  ap(inch) = 0.059, wet
  Interrupted facing
- **Designation** **INSERT** CNMA432 (NC6205, NC6210)
  HOLDER DCLNL20-4D
- **Test result**

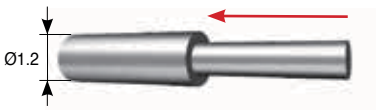




K Ductile cast iron(80-55-06), Shaft

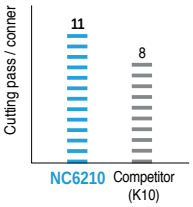
- **Cutting condition** vc(sfm) = 660
  fn(ipr) = 0.011
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** WNMG433-VK(NC6205)
  HOLDER DWLNL16-4D
- **Test result**

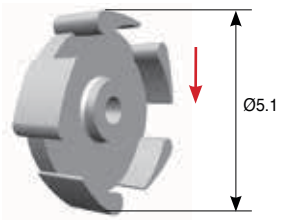




K Gray cast iron(No 35 B), Nipple

- **Cutting condition** vc(sfm) = 1,155
  fn(ipr) = 0.010
  ap(inch) = 0.028
  wet
- **Designation** **INSERT** CNMG432-VK(NC6210)
  HOLDER PCLNR16-4D
- **Test result**





PVD Coated Grades

Turning grade for heat resistant alloy and stainless steel

PC8105 New

- Micro grain carbide minimizes chipping of cutting edge due to enhanced edge strength
- Latest PVD coating technology with high hardness and high temperature oxidation resistance
- Improved surface roughness and lower cutting force ensure better lubrication and wear resistance on rake surface.

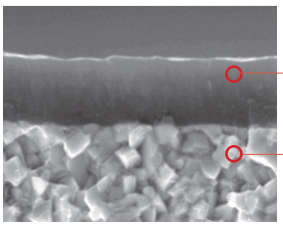
PC8110

- Substrate with superior wear resistance and plastic deformation resistance at high temperature
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Long tool life when machining heat resistant alloy and stainless steel at high steed

PC8115 New

- Ultra fine matrix technology increases wear resistance and chipping resistance.
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Strong cutting edge and excellent chipping resistance guarantees stable machining.
- Long tool life when machining heat resistant alloy and stainless steel at middle to low speed and medium cutting to roughing

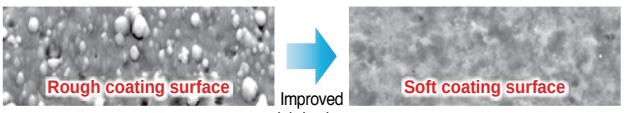
Features of PC8100 Series



It prevents wear at a high temperature to apply excellent surface roughness and coating with oxidation resistance and high hardness.

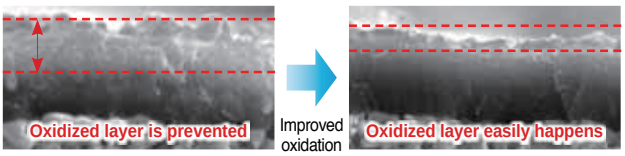
It improves wear resistance to equalize submicron matrix, secure stability between corners and improve chipping- and wear resistance

Coating surface treatment technology (Pictures of coating layer)



Conventional coating — PC8100 Series

Oxidation resistant coating technology (Pictures of coating layer heat-treated at 900°C)



Competitor — PC8100 Series

Selection system of PVD coated grade

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	PC5300	574 (328 ~ 820)	P30	PC5300
		Interrupted cutting		476 (262 ~ 394)	P40	PC5400 New
			PC5400 New	410 (262 ~ 525)	P50	
M	Stainless steel	Continuous cutting	PC8105 New	574 (394 ~ 755)	M01	
			PC8110	525 (361 ~ 689)	M10	PC8105 New, PC8110
			PC8115 New	492 (328 ~ 656)	M20	PC8115 New, PC5300
		Interrupted cutting	PC5300	443 (262 ~ 623)	M30	PC9030, PC5400 New
			PC9030	427 (262 ~ 591)	M40	
			PC5400 New	361 (262 ~ 459)	M50	
S	Heat resistant alloy	Continuous cutting	PC8105 New	180 (131 ~ 230)	S01	PC8105 New, PC8110
			PC8110	164 (115 ~ 213)	S10	PC8115 New, PC5300
			PC8115 New	148 (98 ~ 197)	S20	
		Interrupted cutting	PC5300	131 (66 ~ 197)	S30	PC5400 New
			PC5400 New	115 (66 ~ 164)	S40	
H	Hardened	Interrupted cutting	PC8110	328 (230 ~ 427)	H01	PC8105 New, PC8110
			PC8115 New	295 (213 ~ 377)	H10	PC8115 New

The features of PVD coated grades

PVD Coated grades	ISO	Features
PC8105 New	M05~M15 S01~S10	• For high speed and continuous finishing of hard-to-cut materials and STS • Excellent cutting performance with high wear resistance and oxidation resistance • Ultra fine substrate and the new TiAlN coating layer
PC8110	M10~M20 S05~S15 H01~H10	• For high speed and continuous medium cutting of hard-to-cut materials and STS • Excellent tool life with high wear/plastic deformation resistance at high temperature • New TiAlN coating layer and substrate with excellent thermal resistance
PC8115 New	M15~M25 S10~S20 H05~H15	• For medium to low speed and medium to rough cutting of hard-to-cut materials and STS • Excellent tool life with high wear resistance and chipping resistance • Ultra fine substrate and the new TiAlN coating layer
PC5300	P30~P40 M20~M30 K20~K25 S15~S25	• Universal grade for stainless,HRSA,steel and interrupted cast iron machining • High chipping and welding resistance for longer tool life • New TiAlN coating and ultra fine grain substrate adopted
PC9030	M25~M35	• Medium,roughing and heavy interrupted cutting for stainless steel • TiAlN coating and ultra fine grain substrate adopted • High chipping and welding resistance for stable machining
PC5400 New	P35~P45 M30~M40 K30~K35 S25~S35	• For medium cutting for hard-to-cut materials, stainless steel, steel, and cast iron at medium or low speed • Stable machinability with chipping resistance, fracture resistance and welding resistance • Ultra fine substrate with high toughness and new AlCiN layer

Cutting performance (PC8105 / PC8110 / PC8115)

S Inconel 718

■ **Cutting condition** vc(sfm) = 164
fn(ipr) = 0.006
ap(inch) = 0.020
wet

■ **Designation** **INSERT** CNMG432-VP3(PC8105)
HOLDER PCLNR16-4D

■ **Test result**

PC8105 | Competitor A | Competitor B

S Inconel 718

■ **Cutting condition** vc(sfm) = 164
fn(ipr) = 0.006
ap(inch) = 0.020
wet

■ **Designation** **INSERT** CNMG432-VP3(PC8115)
HOLDER PCLNR16-4D

■ **Test result**

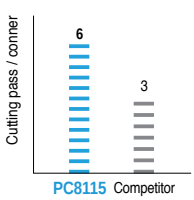
PC8115 | Competitor A | Conventional grade

M Stainless steel (316L)

■ **Cutting condition** vc(sfm) = 262
fn(ipr) = 0.008
ap(inch) = 0.276
wet

■ **Designation** **INSERT** CNMG432–VP3(PC8115)
HOLDER PCLNR16-4D

■ **Test result**

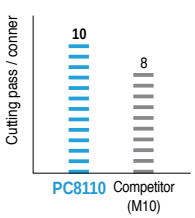


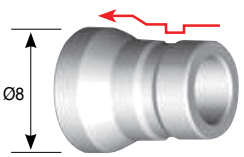
S Inconel 625

■ **Cutting condition** vc(sfm) = 197
fn(ipr) = 0.008
ap(inch) = 0.08
wet

■ **Designation** **INSERT** DNMG442-HS
HOLDER DDLNL16-4D

■ **Test result**



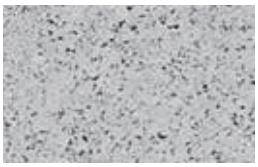


KORLOY Uncoated Carbide Grades

Uncoated carbide grades for turning application of titanium

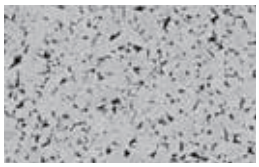
H01

- Increased wear resistance and chipping resistance with the use of ultra fine substrate
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Excellent tool life when finishing titanium alloy at high speed

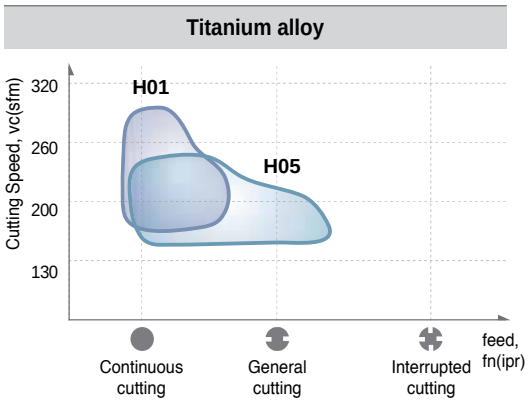


H05

- The 1st recommended grade for machining titanium alloy in a variety of cutting conditions
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Ideal for medium cutting of titanium alloy
- On top of that, we recommend a PVD coated universal grade, PC5300 in interrupted machining or roughing of titanium alloy.



Grades Line up



Selection system

Workpiece		Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	ST10	492 (361 ~ 623)	P10	ST10
		ST15	443 (328 ~ 558)	P20	ST15
		ST20	394 (295 ~ 492)	P30	ST20
		ST30A	361 (262 ~459)	P40	ST30A
K	Cast iron	H02	525 (394 ~ 656)	K01	H01
		H01, H05	492 (361 ~ 623)	K10	H02
		H10, G10	459 (328 ~ 591)	K20	H05, H10, G10
N	Aluminum alloy	H01	1969 (1476 ~ 2461)	N10	H01
	Aluminum alloy	H05	1394 (1050 ~ 1739)	N20	H05
S	Titanium alloy	H01	180 (131 ~ 230)	S01	H01
		H05	164 (115 ~ 213)	S10	H05
H	High hardness steel	H01	262 (180 ~ 344)	H10	H01

Main application

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Heat resistance, excellent plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General tools stable heat resistance with strength	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High strength and superior wear resistance	Cast iron, Non-ferrous metal, Plastic, etc
S	WC-Co	Excellent wear resistance and chipping resistance	Titanium alloy

Properties of Uncoated Carbide

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm²)	Young's modulus (10^3kgf/mm²)	Thermal expansion coefficient(10^{-6}/℃)	Thermal conductivity (cal/cm · sec·℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	A40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105
S	H01	92.9	210	66	4.7	109
	H05	91.8	250	-	-	-

1KPa = 102kgf/m², 1w/mk = 2.39×10^{-3}cal/cm·sec·℃

Cutting performance (H01 / H05)

S Titanium alloy (Ti-6Al-4V)

■ **Cutting condition** vc(sfm) = 328
fn(ipr) = 0.004
ap(inch) = 0.020
wet

■ **Designation** **INSERT** CNMG432-VP1(H01)
HOLDER PCLNR16-4D

■ **Test result**

H01(VP1) H01(VP3) Competitor

S Titanium alloy (Ti-6Al-4V)

■ **Cutting condition** vc(sfm) = 262
fn(ipr) = 0.008
ap(inch) = 0.079
wet

■ **Designation** **INSERT** CNMG432-VP3(H05)
HOLDER PCLNR16-4D

■ **Test result**

H05 Competitor A Competitor B

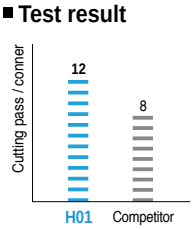
S Titanium alloy (Ti-6Al-4V)

■ **Workpiece** Part of an industrial machine

■ **Cutting condition** vc(sfm) = 197
fn(ipr) = 0.008
ap(inch) = 0.031
wet

■ **Designation** **INSERT** CNMG432–VP2(H01)
HOLDER PCLNL16-4D

■ **Test result**



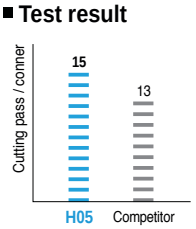
S Titanium alloy (Ti-6Al-4V)

■ **Workpiece** Part of an industrial machine

■ **Cutting condition** vc(sfm) = 164
fn(ipr) = 0.006
ap(inch) = 0.079
wet

■ **Designation** **INSERT** CNMG432–VP3(H05)
HOLDER PCLNL16-4D

■ **Test result**



Cermet Grades

Solution for turning application of steel

CN1500 New

- For continuous machining of cold/hot forged steel and Sintered ferrous alloy at high speed and low depth of cut
- Excellent wear resistance and crater resistance
- Improved surface roughness acquired by optimized cutting edges

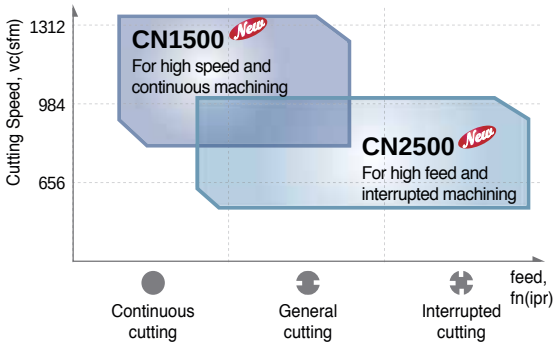
CN2500 New

- For high interrupted machining of cold/hot forged steel and Sintered ferrous alloy at high feed and high depth of cut
- Excellent resistance against chipping, fracture and thermal crack
- Improved surface roughness acquired by optimized cutting edges

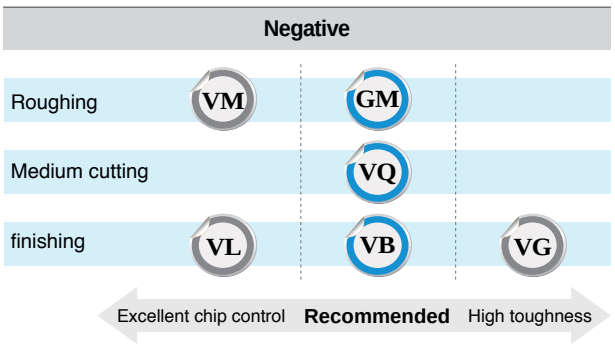
Recommended cutting condition

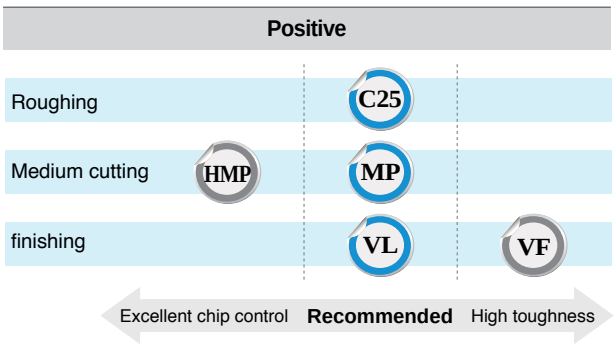
Division	Workpiece	Grade	Recommended cutting speed(sfm)		
			Minimum	Recommended	Maximum
Turning	1010 (AISI) C10E (DIN)	CN1500	492	**886**	1312
		CN2500	427	**787**	1148
	1045 (AISI) C45 (DIN)	CN1500	492	**820**	1148
		CN2500	427	**722**	984
	4140(H)(AISI) 42CrM04	CN1500	394	**722**	984
		CN2500	328	**656**	820

Grade Line up



Chip breakers Line up





Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	CN1500 New	820 (492 ~ 1148)	P10	CN1500 New
		Interrupted cutting	CN2500 New	722 (427 ~ 984)	P20	
					P30	CN2500 New

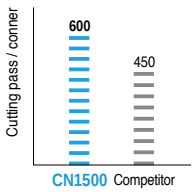
Comparison of chip breakers

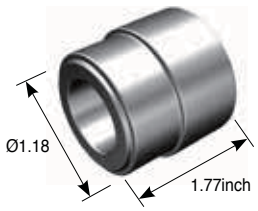
Insert types	Machining types	Application range	Chip breakers				
			KORLOY	CompetitorA	CompetitorB	CompetitorC	CompetitorD
Nega type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	TF	FA
	Continuous cutting	For continuous cutting with stronger cutting edges than VL chip breaker	**VG**	FG	XP	TSF	LU
	General cutting	For low interrupted cutting with stronger cutting edges than VG chip breaker	**VB**	FG	CQ	TS	SE
	General cutting	For medium cutting to finishing at low interruption	**VQ**	MC	HQ	AS, ZM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**GM**	MT	HS	TM	GU
Posi type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	PF	FP
	Continuous cutting	Enhanced chip control when machining internal diameter with stronger cutting edges than VL chip breaker	**VF**	FG-PC	HQ	PS	LU
	General cutting	Stronger cutting edges than VF chip breaker	**MP**	FG	HQ	PS	LU
	General cutting	For medium cutting to finishing at low interruption	**HMP**	FG	HQ	PM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**C25**	MT	GK	24	SC

Cutting performance (CN1500)

P Carbon steel (1045)

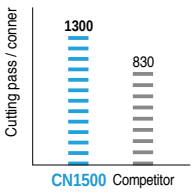
- **Cutting condition**: vc(sfm) = 656, n(rpm) = 1,800, fn(ipr) = 0.004, ap(inch) = 0.012, wet
- **Designation**: INSERT CCMT32.51-HMP(CN1500), HOLDER SCLCR12-3B
- **Test result**

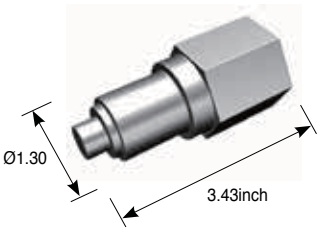




P Alloy Steel (4131)

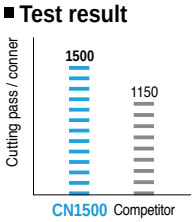
- **Cutting condition**: vc(sfm) = 755, n(rpm) = 2,000, fn(ipr) = 0.005, ap(inch) = 0.031, wet
- **Designation**: INSERT TNMG331-VQ(CN1500), HOLDER DTGNR20-3D
- **Test result**

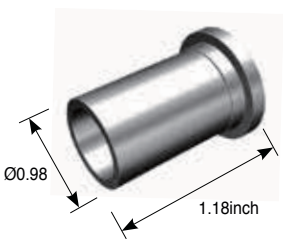




P Bearing steel (52100)

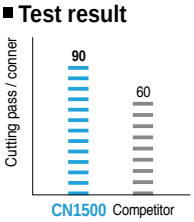
- **Cutting condition**: vc(sfm) = 656, n(rpm) = 2,500, fn(ipr) = 0.004, ap(inch) = 0.012, wet
- **Designation**: INSERT DCMT32.50-VF(CN1500), HOLDER SDJCR16-3D
- **Test result**

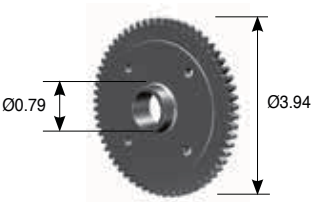




P Sintered ferrous alloy

- **Cutting condition**: vc(sfm) = 525, n(rpm) = 1,200, fn(ipr) = 0.007, ap(inch) = 0.008, wet
- **Designation**: INSERT SNMG432-VM(CN1500), HOLDER MSRNR16-4D
- **Test result**

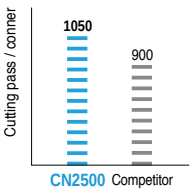




Cutting performance (CN2500)

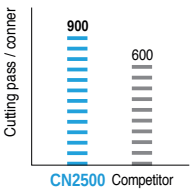
P Carbon steel (1045)

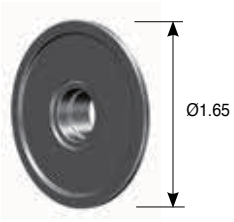
- **Cutting condition**: vc(sfm) = 607, n(rpm) = 2,300, fn(ipr) = 0.006, ap(inch) = 0.016, wet
- **Designation**: INSERT CCMT32.51–MP(CN2500), HOLDER SCLCR12-3D
- **Test result**



P Alloy Steel (5120H)

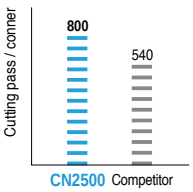
- **Cutting condition**: vc(sfm) = 656, n(rpm) = 2,000, fn(ipr) = 0.006, ap(inch) = 0.008, wet
- **Designation**: INSERT DCMT32.51-HMP(CN2500), HOLDER SDJCR16-3D
- **Test result**

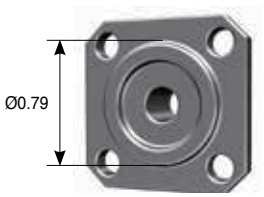




P Sintered ferrous alloy

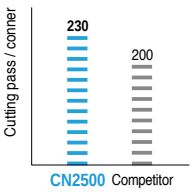
- **Cutting condition**: vc(sfm) = 919, n(rpm) = 2,000, fn(ipr) = 0.008, ap(inch) = 0.008, wet
- **Designation**: INSERT VBMT331-MP(CN2500), HOLDER SVABL12-3B
- **Test result**





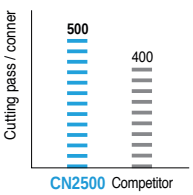
P Alloy Steel (4115)

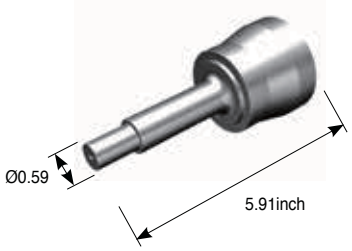
- **Cutting condition**: vc(sfm) = 984, n(rpm) = 2,200, fn(ipr) = 0.010, ap(inch) = 0.012, wet
- **Designation**: INSERT CNMG432-GM(CN2500), HOLDER PCLNR16-4D
- **Test result**



P Carbon steel (1045)

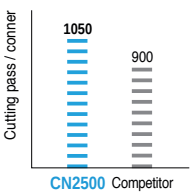
- **Cutting condition**: vc(sfm) = 984, n(rpm) = 2,800, fn(ipr) = 0.010, ap(inch) = 0.016, wet
- **Designation**: INSERT CNMG431-VB(CN2500), HOLDER PCLNR20-5D
- **Test result**





P Alloy Steel (5120)

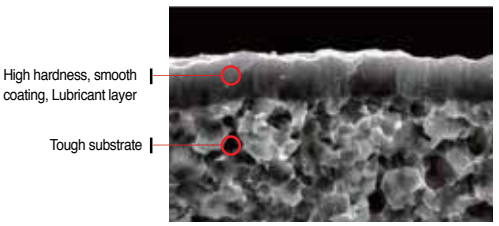
- **Cutting condition**: vc(sfm) = 656, n(rpm) = 2,300, fn(ipr) = 0.008, ap(inch) = 0.012, wet
- **Designation**: INSERT CCMT32.51-HMP(CN2500), HOLDER SCLCR12-3D
- **Test result**



KORLOY Coated Cermet Grades

Features

- Impact resistance and superior toughness substrate prevents chipping and fracture at the initial stage ensuring longer tool life
- Lubricant coating layer improves chip flow and reduces insert load



Coated cermet for machining carbon steel, alloy steel and sintered ferrous components

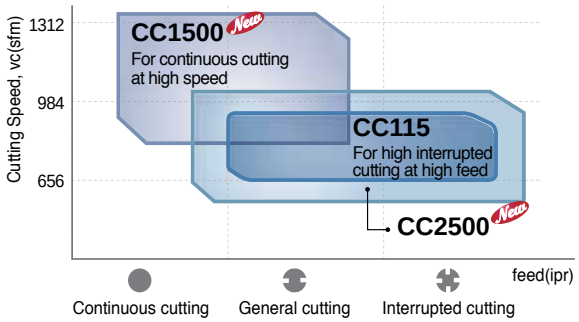
CC1500 New

- Coating layer : Excellent lubrication and surface roughness
- Substrate : Excellent chipping resistance

Recommended cutting condition

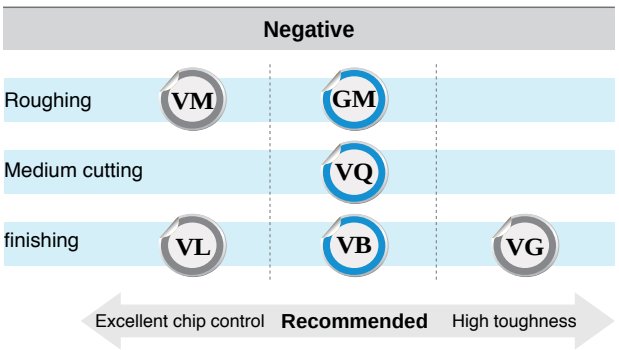
Division	Workpiece	Grade	Recommended cutting speed(sfm)		
			Minimum	Recommended	Maximum
Turning	1010 (AISI) C10E(DIN)	CC1500	656	**1148**	1476
		CC2500	591	**951**	1312
	1045 (AISI) C45 (DIN)	CC1500	656	**984**	1312
		CC2500	591	**886**	1148
	4140(H) (AISI) 42CrM04	CC1500	591	**886**	1148
		CC2500	492	**820**	984

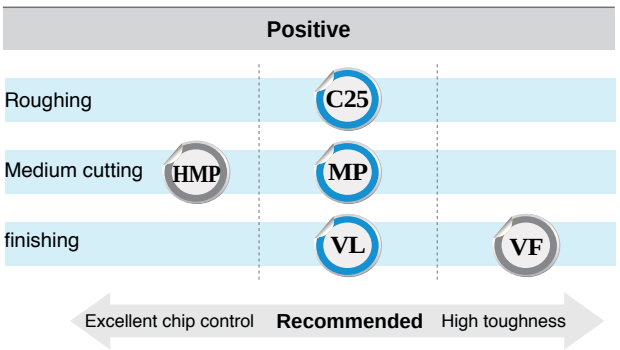
Grades Line up



※ CC115 is supposed to be replaced with CC2500 from 2017

Chip breakers Line up





Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	CC1500 New	1148 (853 ~ 1444)	P10	CC1500 New
		Interrupted cutting	CC2500 New	1017 (755 ~ 1280)	P20	CC2500 New
			CC125	755 (492 ~ 984)	P30	CC125

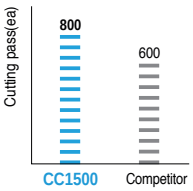
The features of KORLOY coated cermet grade

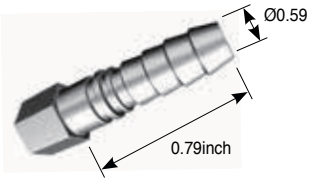
Coated cermet	ISO	Features
CC1500 New	P10 ~ P20	• PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring
CC2500 New	P20 ~ P30	• PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available
CC125	P25 ~ P35	• PVD coated Cermet • High toughness cermet for Turning

Cutting performance (CC1500)

P Carbon steel (1020)

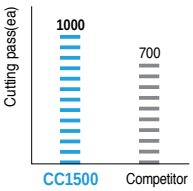
- **Workpiece** Nipple
- **Cutting condition** vc(sfm) = 558
  n(rpm) = 2,000
  fn(ipr) = 0.005
  ap(inch) = 0.005
  wet
- **Designation** **INSERT** TPMT221-MP(CC1500)
  HOLDER S12R-STWPR2
- **Test result**

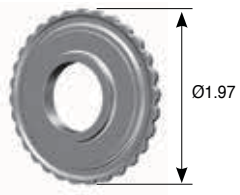




P Alloy Steel (1040)

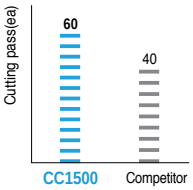
- **Workpiece** Plate carrier
- **Cutting condition** vc(sfm) = 1476
  n(rpm) = 2,500
  fn(ipr) = 0.008
  ap(inch) = 0.008
  wet
- **Designation** **INSERT** DCMT32.51-HMP(CC1500)
  HOLDER SDJCR16-3D
- **Test result**

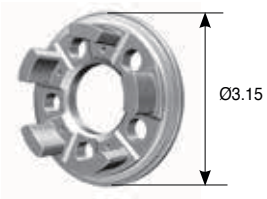




P Carbon steel (1045)

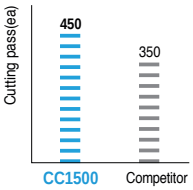
- **Workpiece** Cut plate carrier
- **Cutting condition** vc(sfm) = 984
  n(rpm) = 2,500
  fn(ipr) = 0.012
  ap(inch) = 0.016
  wet
- **Designation** **INSERT** CCMT32.51-C25(CC1500)
  HOLDER SCACR08-3K
- **Test result**

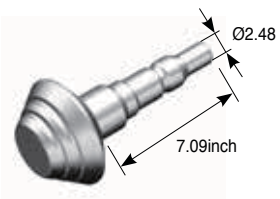




P Alloy Steel (4118)

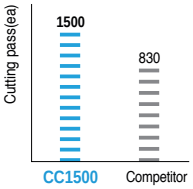
- **Workpiece** Pinion
- **Cutting condition** vc(sfm) = 820
  n(rpm) = 2,500
  fn(ipr) = 0.008
  ap(inch) = 0.020
  wet
- **Designation** **INSERT** DNMG441-VL(CC1500)
  HOLDER PDJNR16-4D
- **Test result**

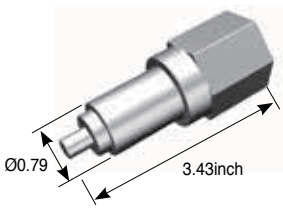




P Hot forging (4130)

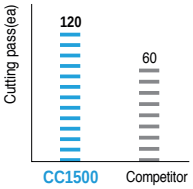
- **Workpiece** Valve
- **Cutting condition** vc(sfm) = 755
  n(rpm) = 2,200
  fn(ipr) = 0.031
  ap(inch) = 0.005
  wet
- **Designation** **INSERT** TNMG331-VQ(CC1500)
  HOLDER PTTNR10-3A
- **Test result**

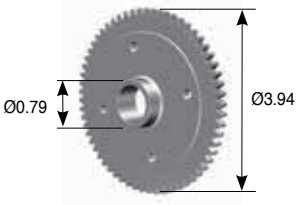




P Sintered ferrous alloy

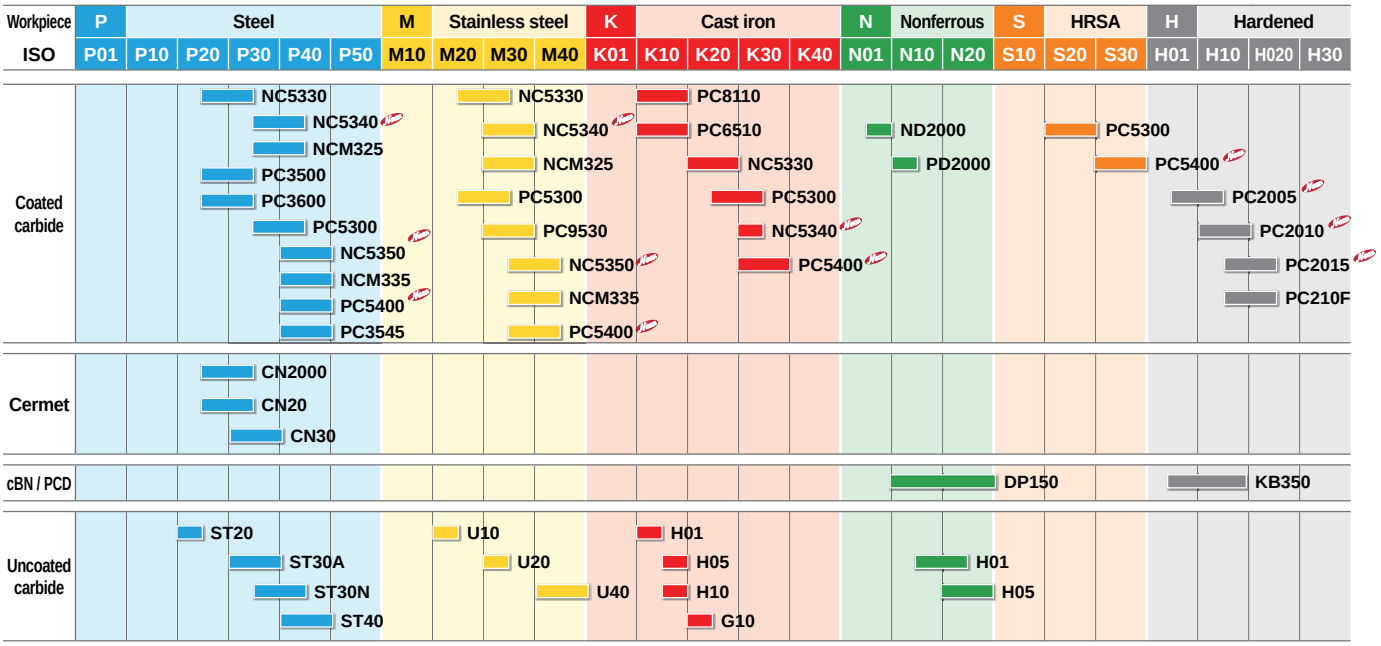
- **Workpiece** Sprocket
- **Cutting condition** vc(sfm) = 525
  n(rpm) = 500
  fn(ipr) = 0.007
  ap(inch) = 0.008
  wet
- **Designation** **INSERT** SNMG432-VM(CC1500)
  HOLDER MSKNR85-4D
- **Test result**



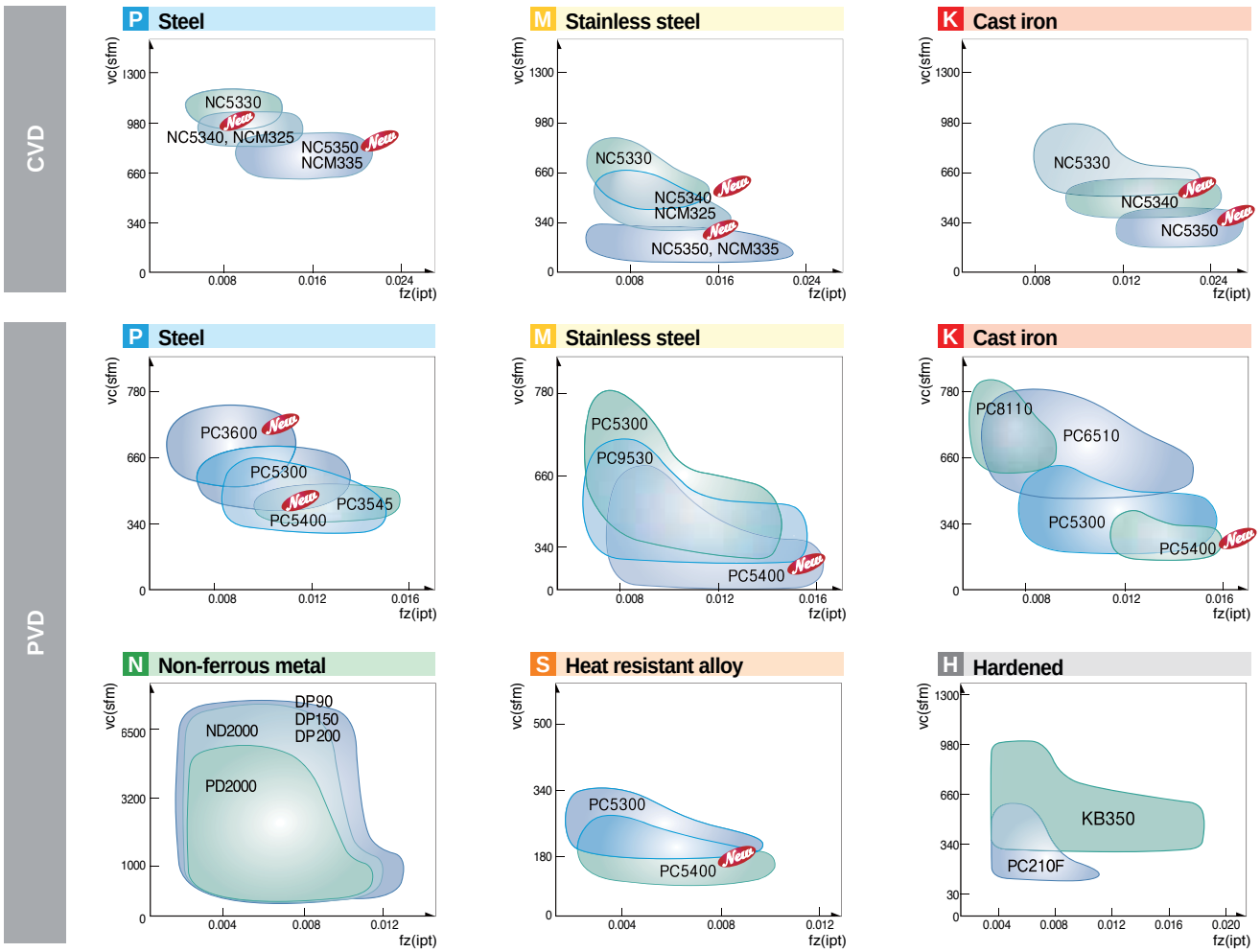


The best way to choose KORLOY Milling inserts

Selection system



Application range of Milling grades



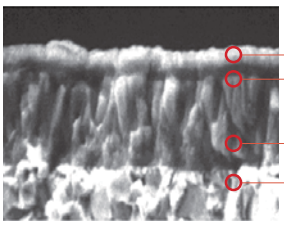
CVD Coated grades

Universal CVD coated grades

NC5330 / NC5340 / NC5350

- Excellent quality and universal purpose applicable to P.M.K
- High toughness substrate and coating layer with excellent surface roughness and welding resistance

Coating structure



- TiN film : Smooth surface roughness and superior anti built-up-edge
- Fine columnar TiCN film : Optimimal toughness and hardness
- TiCN film : High toughness and wear resistance
- Al_2O_3 film : Excellent oxidation resistance

Selection system of CVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	NC5330	673 (394 ~ 820)	P20	NC5330
					P25	
		Continuous cutting	NC5340 (New) NCM325	755 (427 ~ 1083)	P30	NC5340 (New), NCM325
					P35	
		Interrupted cutting	NC5350 (New) NCM335	673 (394 ~ 820)	P40	NC5350 (New), NCM335
					P45	
M	Stainless steel	Continuous cutting	NC5330	459 (262 ~ 656)	M10	
					M20	
		Continuous cutting	NC5340 (New) NCM325	509 (295 ~ 722)	M25	NC5330, NC5340 (New), NCM325
					M30	
		Interrupted cutting	NC5350 (New) NCM335	459 (262 ~ 656)	M35	NC5350 (New), NCM335
					M40	
K	Cast iron	Continuous cutting	NC5330	623 (361 ~ 886)	K10	
					K20	NC5330
			NC5340 (New)	492 (262 ~ 820)	K30	NC5340 (New)

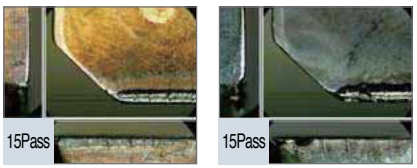
The features of CVD Milling grades

CVD Coated grades	ISO	Features
NC5330	P20 ~ P30 M20 ~ M30 K15 ~ K25	• For high speed milling of steel and stainless steel • Superior wear resistance and chipping resistance grade for steel and stainless steel • MT-TiCN + Al_2O_3 + TiN
NC5340 (New) NCM325	P30 ~ P40 M25 ~ M35 K25 ~ K30	• For high speed milling of steel and stainless steel • Optimized grade for steel & stainless steel by employing proper substrate and hard coating • MT-TiCN + Al_2O_3 + TiN
NC5350 (New) NCM335	P35 ~ P45 M30 ~ M40	• For interrupted and rough milling of steel and stainless steel • Toughest substrate with hard coating provides stable cutting and tool life for severe interrupted cutting • MT-TiCN + Al_2O_3 + TiN

Cutting performance (NC5330 / NC5340)

P Alloy steel (4140)

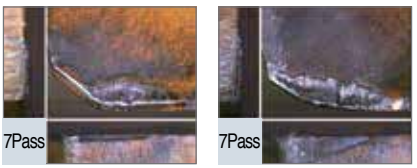
- **Cutting condition** vc(sfm) = 820
  fz(ipt) = 0.012
  ap(inch) = 0.079
  dry
- **Designation** **INSERT** SDKN53AESN-SU
  HOLDER ADNA5500R
- **Test result**



NC5330 Competitor A

P Alloy steel (4140)

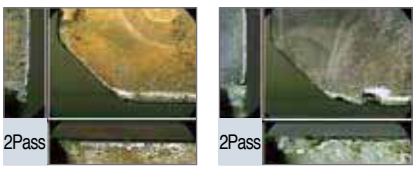
- **Cutting condition** vc(sfm) = 984
  fn(ipr) = 0.012
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** SPCN42EDR(NC5340)
  HOLDER EPN4500R
- **Test result**



NC5340 Competitor A

M Stainless steel (304)

- **Cutting condition** vc(sfm) = 492
  fz(ipt) = 0.010
  ap(inch) = 0.079
  dry
- **Designation** **INSERT** SDKN53AESN-SU
  HOLDER ADNA5500R
- **Test result**



NC5330 Competitor A

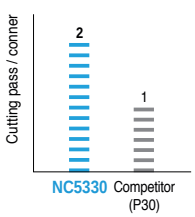
P Carbon steel (1045)

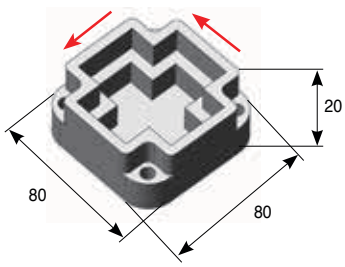
- **Cutting condition** vc(sfm) = 1148
  fn(ipr) = 0.014
  ap(inch) = 0.079
  wet
- **Designation** **INSERT** SPCN42EDR(NC5340)
  HOLDER EPN4500R
- **Test result**

NC5340 Competitor A

K Ductile cast iron (80-55-06)

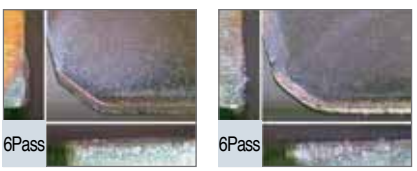
- **Cutting condition** vc(sfm) = 656
  fz(ipt) = 0.008
  ap(inch) = 0.197
  dry
- **Designation** **INSERT** SDKN53AESN-SU
  HOLDER ADNA5400R
- **Test result**





K Gray cast iron (No35B)

- **Cutting condition** vc(sfm) = 1312
  fn(ipr) = 0.008
  ap(inch) = 0.118
  wet
- **Designation** **INSERT** SPCN42EDR(NC5340)
  HOLDER EPN4400R
- **Test result**



NC5340 Competitor A

PVD Coated Grades

PVD new grade for steel milling

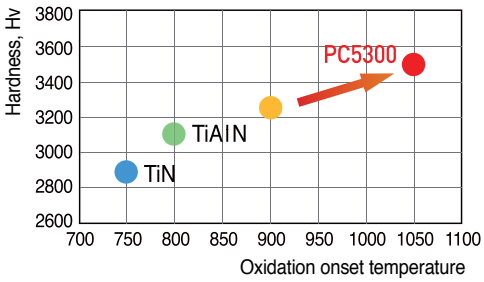
PC3600(SU/MU)

- Coating layer with high hardness and oxidation resistance at high temperature ensures stable tool life.
- Superior wear resistance and impact resistance in high speed machining of P grade materials
  - SU : for general purpose - MU : for cost efficiency

Universal PVD Grade

PC5300

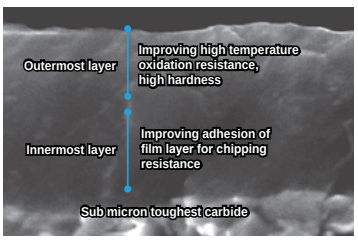
- High efficiency during machining for carbon steel / cast iron / stainless steel / HRSA
- Stable machining due to specific carbide substrate with strong toughness and high hardness that restrains fracture by chipping
- Excellent wear resistance due to special coating film with oxidation resistance, thermal stability, and surface smoothness



PC5400 New

- New PVD coating layer with high toughness and lubrication
- High adhesive strength between substrate with high toughness and the coating layer
- Excellent cutting edge strength and chipping resistance ensure stable machinability for P, M, K, S.

Features



Latest PVD coating technology developed by KORLOY
New concept of coating equipped with high temperature oxidation resistance and high hardness

Selection system of PVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	Continuous cutting	PC3500 PC3600	771 (591 ~ 2690)	P20 P30	PC3500, PC3600
		Interrupted cutting	PC5300	640 (492 ~ 787)	P40	PC5300
			PC5400 New	476 (262 ~ 689)		PC5400 New, PC3545
			PC3545	558 (427 ~ 689)	P50	
M	Stainless steel	Continuous cutting	PC5300	427 (328 ~ 525)	M20	PC5300
			PC9530	410 (262 ~ 492)	M30	PC9530
		Interrupted cutting	PC5400 New	361 (262 ~ 459)	M40	PC5400 New
K	Cast iron	Continuous cutting	PC8110	591 (459 ~ 755)	K05	PC8110, PC6510
			PC6510	591 (459 ~ 755)	K10	
		Interrupted cutting	PC5300	476 (360 ~ 591)	K20	PC5300
			PC5400 New	410 (279 ~ 525)	K30	PC5400 New
S	HSRA	Continuous cutting	PC5300	180 (131 ~ 230)	S10	
					S20	PC5300
		Interrupted cutting	PC5400 New	131 (98 ~ 164)	S30	PC5400 New
H	High hardness steel	Continuous cutting	PC2005 New	197 (131 ~ 262)	H01	PC2005 New
			PC2010 New	180 (131 ~ 230)	H10	PC2010 New
			PC2015 New	164 (115 ~ 213)	H020	PC2015 New
			PC210F	164 (115 ~ 213)	H30	PC210F

The features of PVD coated grades

PVD Coated grades	ISO	Features
PC3500 PC3600	P20 ~ P30	• Milling grade for medium and roughing of steel • New coating layer with superior wear resistance and oxidation resistance with high toughness substrate • TiAlN / New coating • Grooving, Cutting, Milling
PC3545	P35 ~ P45	• Medium and rough milling for steel • Enhanced chipping resistant substrate • K-Gold coating
PC5300	P30~P40 K20~K30 M20~M30 S15~S25	• Superior universal grade for steel, cast iron, hard to cut material, stainless steel • New coating and ultra fine grain provide wear resistance and oxidation resistance • For turning, milling, grooving, parting, drilling, and threading
PC5400 New	P35~P45 K25~K35 M30~M40 S25~S35	• Universal grade for interrupted machining of steel, cast iron, hard-to-cut materials and stainless steel with stable machinability • New coating layer with high toughness and lubrication on ultra fine grain substrate with high toughness • AlCiN series new coating • For turning, milling, grooving and drilling
PC8110	K05~K15	• Medium and rough cutting for hard to cut material and stainless steel • Superior wear resistance for finishing cast iron • New coating and ultra fine grain provide wear resistance and oxidation resistance • For turning, milling, grooving, parting
PC6510	K05~K15	• High speed milling grade for cast iron and aluminum • K-Gold coating
PC9530	M25 ~ M35	• Milling grade for cast iron and aluminum in medium to low cutting speed • The toughest sub-micron substrate provides excellent cutting performance at high feed • TiAlN coating • For milling, drilling
PC2005 New	H01 ~ H10	• Exclusive for Laser Mill in milling of high hardness workpieces and press mold steel • Utmost wear resistance due to high hardness substrate and coating • Ultra high hardness K-Brown coating
PC2010 New	H05 ~ H15	• Exclusive for Laser Mill in milling of pre hardened steel and plastic mold steel • High hardness enhanced cutting edges due to ultra fine WC and high contents binder for expanding application range to high hardness steel and pre hardened stee • Ultra high hardness K-Brown coating
PC2015 New	H10 ~ H020	• Exclusive for Laser Mill in milling of carbon steel and cast • Lubricative coating layer and high contents substrate for machining mild steel and hard-to-cut cast materials
PC210F	H10 ~ H020	• High speed milling grade for hardened steel , cast iron, and stainless steel(Laser Mill) • New coating and ultra fine grain provide wear resistance and oxidation resistance • Endmilling

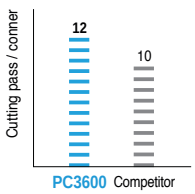
Cutting performance (PC3600)

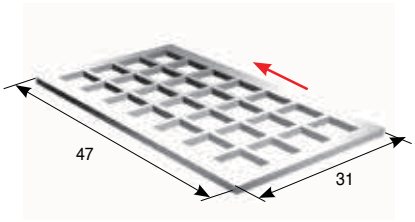
P Alloy tool steel(A283-C)

■ **Cutting condition** vc(sfm) = 708
fz(mm/t) = 0.016
ap(inch) = 0.04
dry

■ **Designation** **INSERT** TPKN43PDSR-SU
HOLDER PPNA4500R

■ **Test result**



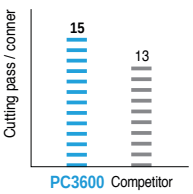


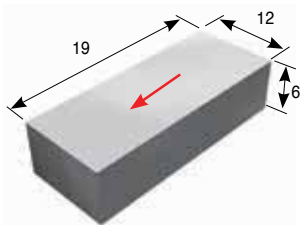
P Alloy tool steel(4130)

■ **Cutting condition** vc(sfm) = 228
fz(ipt) = 0.150
ap(inch) = 1.00
dry

■ **Designation** **INSERT** SDKN53AESN-SU(PC3600)
HOLDER ADNA51200R

■ **Test result**



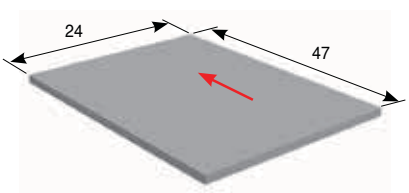


P Carbon steel(1045)

■ **Cutting condition** vc(sfm) = 1004
fz(ipt) = 0.005
ap(inch) = 0.08
dry

■ **Designation** **INSERT** SDKN42AESN-SU
HOLDER ADNA41200R

■ **Test result**

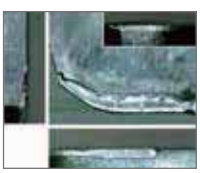


P Alloy tool steel(D2)

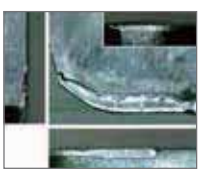
■ **Cutting condition** vc(sfm) = 656
fz(ipt) = 0.008
ap(inch) = 0.08
dry

■ **Designation** **INSERT** SPKN53EDSR-SU
HOLDER EPNA5600R

■ **Test result (340min machining)**



PC3600

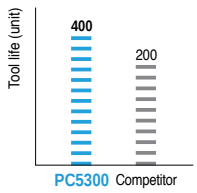


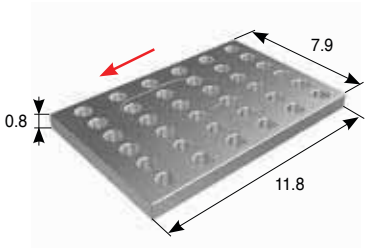
Competitor

Cutting performance (PC5300)

P Mold steel(P20)

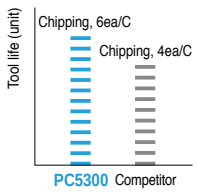
- **Cutting condition** vc(sfm) = 820
  fn(ipr) = 0.039
  ap(inch) = 0.039
  dry
- **Designation** **INSERT** WNMX130520ZNN-MM
  HOLDER HRMDCA13200HR-3
- **Test result**

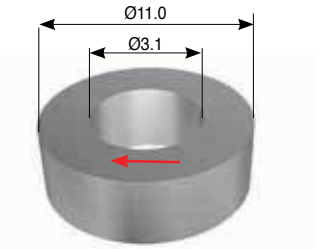




M Stainless steel(316)

- **Cutting condition** vc(sfm) = 213
  fn(ipr) = 0.006
  ap(inch) = 0.118
  wet
- **Designation** **INSERT** SEET14M4AGSN-MM
  HOLDER FMACA4400HR
- **Test result**

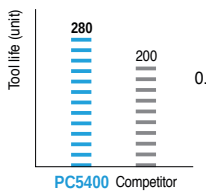


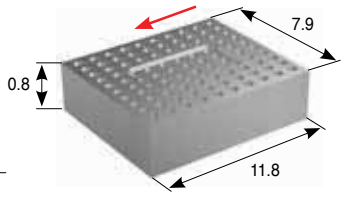


Cutting performance (PC5400)

P Carbon steel (1045)

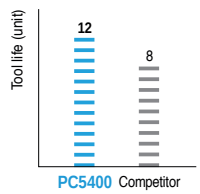
- **Cutting condition** vc(sfm) = 820
  fz(mm/t) = 0.047
  ap(inch) = 0.039
  dry
- **Designation** **INSERT** WNMX130520ZNN-MM
  HOLDER HRMDCA13200HR-4
- **Test result**

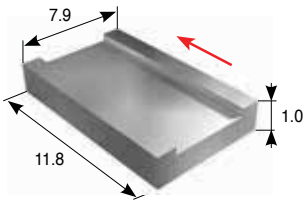




P Alloy steel (5140)

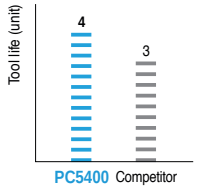
- **Cutting condition** vc(sfm) = 591
  fz(ipt) = 0.008
  ap(inch) = 0.079
  dry
- **Designation** **INSERT** RDKT1605M0-MM
  HOLDER FMRCA5250HRD-H
- **Test result**

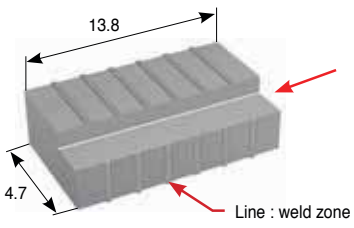




M Stainless steel(316)

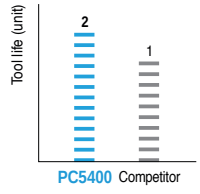
- **Cutting condition** vc(sfm) = 164
  fz(ipt) = 0.004
  ap(inch) = 0.157 ae(inch) = 0.591
  dry
- **Designation** **INSERT** APMT1604PDSR-MM
  HOLDER AMCA3250HS
- **Test result**

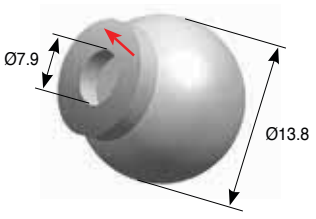




S Heat-resisting alloy INCONEL 718

- **Cutting condition** vc(sfm) = 197
  fz(ipt) = 0.004
  ap(inch) = 0.098
  wet
- **Designation** **INSERT** SNMX1206ANN-MM
  HOLDER RM8ACA4300HR
- **Test result**

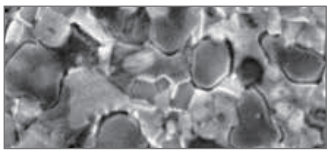




Uncoated Carbide Grades

Features

▶ Due to KORLOY's advanced sintering technology, our uncoated carbide grades have a fine alloy structure which is necessary to get superior quality from a uncoated cutting tool



P type

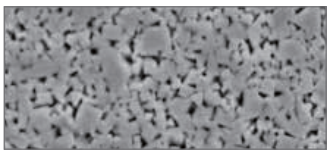
Advantages

▶ Consist of P,M,K carbide grades and can be used in all kinds of workpiece

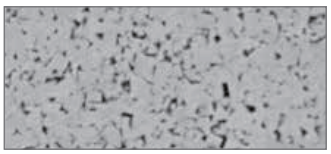
▶ Excellent quality at machining with coolant, due to the superior thermal crack resistance of the carbide

▶ Due to the special design of carbides, it has fine micro structure and low affinity with workpiece

▶ It has excellent toughness and produces lower cutting loads



M type



K type

Selection system

Workpiece		Grade	Recommended cutting speed(sfm)	ISO	Application range
P	Steel	ST30A	262 (197 ~ 328)	P30	ST30A
K	Cast iron	H01, H05	492 (361 ~ 623)	K01	H01, H05, H10
		H10, G10	394 (295 ~ 492)	K10	G10
N	Aluminum alloy	H01	1969 (1476 ~ 2461)	K20	H01
	Copper alloys	H05	1394 (1050 ~ 1739)	K30	H05

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Excellent thermal shock resistance and plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General grades with thermal shock resistance and hardness	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High hardness and superior wear resistance	Cast iron, Non-ferrous metal, Non metal

The physical properties of grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf / mm²)	Young's modulus (10^3kgf / mm²)	Thermal expansion coefficient(10^{-6}/ ℃)	Thermal conductivity (cal / cm·sec·℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U200	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	U40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

1KPa = 102kgf/m², 1w/mk = 2.39×10^{-3}cal/cm·sec·℃

Milling Cermet Grades

Features

- ▶ High hardness substrate ensures long tool life in high speed milling.
- ▶ High toughness cutting edge ensures long tool life even in high impact machining.
- ▶ Chemically stable substrate provides excellent surface finish of the workpiece.

Selection system

Workpiece		Machining types	Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CN2000	820 (656~984)	P10 ~ P20	
			CN20	591 (427~755)	P15 ~ P25	CN2000 / CN20 / CN30
		Interrupted cutting	CN30	492 (328~656)	P20 ~ P30	

The features of main cermet grades

Cermet Grade	ISO	Features
CN2000	P10 ~ P20	• Universal grade from finishing to roughing of steel • Functionally Gradient Material
CN20	P15 ~ P25	• For general turning and milling of steel • Universal cermet with wear resistance and toughnes
CN30	P20 ~ P30	• For milling of steel • Cermet with high toughness

The physical properties of grades

Workpiece	Grade	Hardness(Hv)	TRS(kgf/mm^2)	SG(g·cm^{-3})
P	CN2000	< 1800	210 <	6.8 ~ 7.0
	CN20	< 1600	220 <	6.7 ~ 7.0
	CN30	< 1500	240 <	7.0 ~ 7.3

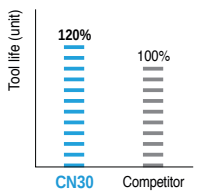
Cutting performance

P D2, NAK80, 1045, P20

■ **Cutting condition**
vc(sfm) = 394~492
fz(ipt) = 0.003~0.005
ap(inch) = 0.08
dry

■ **Designation**
INSERT SDCN42MT
HOLDER ADNA41200R

■ **Test result**

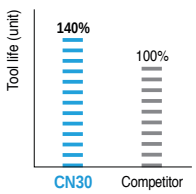


P 1055, P20

■ **Cutting condition**
vc(sfm) = 754
fz(ipt) = 0.004~0.006
ap(inch) = 0.04
dry

■ **Designation**
INSERT SDCN42MT
HOLDER ADNA41200R

■ **Test result**



Selection of Solid endmill grades

Item	Grade	
	Coated	Uncoated
H-Max	PC203F	
H Endmill New	PC303S, PC310U	
V Endmill New	PC215F	
I-Max	PC220	FA2
Z Endmill New	PC315E	
I+ Endmill New	PC320	
F Endmill	PC203F	
Micro Endmill	PC215F	

Item	Grade	
	Coated	Uncoated
Endmill for HRSA	PC210	
S+ Endmill New	PC325	
Aluminum solid endmill	PD3000	H01
A+ Endmill New	H05S	
C-Max	PC210C	
D-Max	ND3000	
Brazed endmill	PC221F	FCC

Selection system of PVD coated grades

Workpiece		grade	ISO	Application range
P	Steel	PC303S New	P01	PC303S New, PC203F, PC310U New, PC315E New, PC320 New, PC215F, PC220, FA2, PC221F FCC
		PC310U New	P10	
		PC315F New	P20	
		PC320 New	P30	
			P40	
M	Stainless steel	PC303S New	M01	PC303S New, PC203F, PC310U New, PC210, PC325 New, PC315F New, PC320, PC215F, PC220
		PC310U New	M10	
		PC210	M20	
		PC325 New	M30	
		PC315E New	M40	
K	Cast iron	PC303S New	K01	PC303S New, PC203F, PC310U New, PC315E New, PC320 New, PC215F, PC220, FA2
		PC310U New	K10	
		PC315F New	K20	
		PC320 New	K30	
			K40	
N	Non ferrous	ND3000	N01	ND3000, PD3000, H01, H05S, PC210C, FA2
		PD3000	N05	
		H01	N10	
		H05S	N20	
		PC210C	N30	
		FA2	N40	
S	HRSA	PC210	S10	PC210, PC325 New, PC315E New, PC320, PC215F, PC220, FA2
		PC325 New	S20	
		PC315E New	S30	
H	High hardness steel	PC303S New	H01	PC303S New, PC203F, PC310U New
		PC203F	H10	
		PC310U New	H020	

The features of PVD coated grades

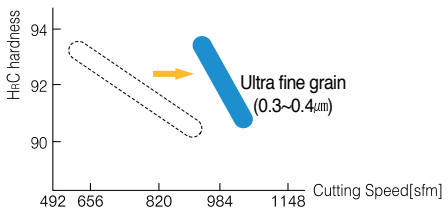
Workpiece	ISO	Features
PC303S New	P05~P15 / M05~M15 K05~K15	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC310U New	P10~P20 / M10~M20 K10~K20	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC315E New / PC320 New	P20~P35 / M20~M30 K20~K35 / S20~S30	• Excellent wear/welding resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For low/medium speed machining of general steel • New film applied with excellent chipping/wear resistance
PC325 / PC210 New	M15~M25 S15~S25	• For low/medium speed machining of stainless steel and heat resistant alloy • Excellent wear/welding resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • New film applied with excellent welding/oxidation resistance
PC210C	N10~N20	• Excellent combination of chipping resistance substrate and K-Silver coating file having wear resistance, good lubrication
ND3000	N01~N05	• For electrode machining of graphite at medium to high speeds • Dia. coating layer with high wear resistance and lubrication
PD3000	N05~N10	• For non-ferrous metals(Aluminum alloy) machining • DLC(Diamond Like Carbon) coating layer with high wear resistance and lubrication

Ultra fine grain cemented carbide

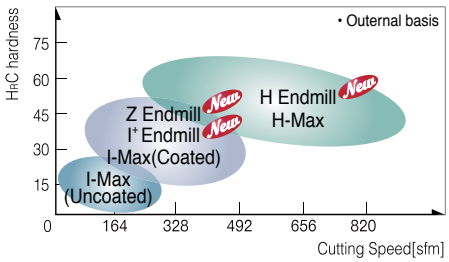
Features

▶ Ultra fine grade has better toughness than general cemented carbide with same hardness. These properties allow it to replace High Speed Steel

▶ This is achieved through a high oxidation temperature(1200℃) with high hardness, and provides superior performance for high speed cutting and dry cutting



• Increasing TRS, Cutting speed by applying ultra fine grain



Features of Korloy endmills

Index	Features
H Endmill / H-Max (Endmill for high hardness steel)	• Negative cutting edges proper to machine high hardness heat-treated workpiece under HRC70 • Longer tool life with the use of ultra fine substrate and high hardness film
Z Endmill / I+ Endmill (Endmill for general cutting)	• Excellent in machining various workpieces such as carbon steel, cast iron, pre hardened steel, etc. under HRC70 • Longer tool life with the use of ultra fine substrate and new coating technology
SSEA / A+ Endmill (Endmill for aluminum)	• Suitable for high speed machining in aluminum and other non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate
IFSE / S+ Endmill (Endmill for hard-to-cut materials)	• Sharp cutting edge and high rake angle with streamline chip pocket shows good cutting performance in stainless steel machining where work hardening is a problem.
C-Max	• Excellent combination of chipping resistant substrate and CrN coating film having wear resistance and chipping resistance
D-Max	• Optimum coated property with fine diamond particle in nonferrous metal machining as graphi increasing tool life and good surface roughness through improved edge geometry • Available to cutting application in intermittent cutting condition and high precision machining as well

Selection of drill grades

Item	Grade	
	Coated	Uncoated
MSD	PC205F	FG2
MSD Plus New	PC325U	FG2
MLD	PC215G, PC315G	FG2
MLD Plus New		
VZD	PC230F	
SSD		FG2

Selection system

Workpiece		ISO	Application range
P	Steel	P01	
		P10	
		P20	PC215G New, PC315G New, PC205F, PC325U New, PC230F
		P30	
M	Stainless steel	M01	
		M10	
		M20	PC215G New, PC315G New, PC205F, PC325U New
		M30	
K	Cast iron	K01	
		K10	
		K20	PC215G New, PC315G New, PC205F, PC325U New
		K30	
N	HRSA	N01	
		N10	FG2
		N20	
		N30	

The features of PVD coated grades

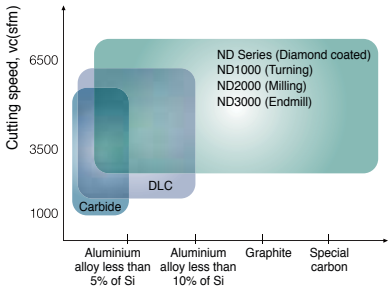
Grade	ISO	Features
PC205F	P20 ~ P35 M20 ~ M30 K20 ~ K35	• Universal grade for machining steel, cast iron, stainless steel, heat resistant alloy, etc. • Substrate with excellent wear/chipping resistance and TiAlN film
PC325U New	P20 ~ P35 M20 ~ M30 K20 ~ K35	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC215G New	P15 ~ P30 M15 ~ M25 K15 ~ K30	• Universal grade for machining steel, cast iron, etc. • Stable cutting performance with excellent wear/chipping resistance
PC315G New	P15 ~ P30 M15 ~ M25 K15 ~ K30	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC230F	P25 ~ P35	• For machining general steel at medium to high speed • Stable cutting performance with excellent wear/chipping resistance
FG2	N05 ~ N25	• Increased wear/chipping resistance with the use of ultra fine substrate

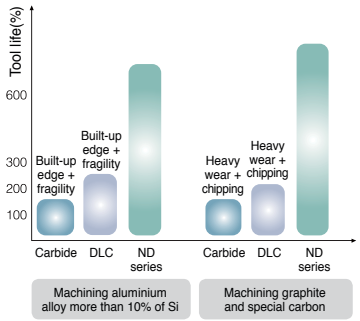
Diamond Coated Grades

Features

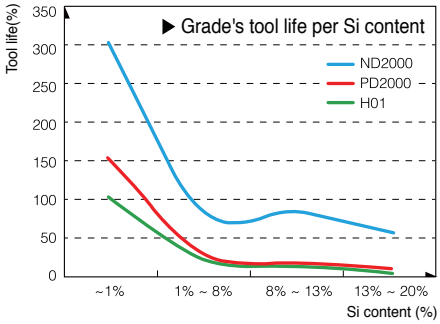
- ▶ Increased tool life of up to 150% due to KORLOY's nano technology
- ▶ The nano-size (~100nm) of diamond particles decreases the friction co-ef ficient Less friction leads to better chip flow
- ▶ Due to the minimized built-up is guaranteed edges, the excellent surfaces finish

Application range





Cutting Performance of ND Series



- Graphite machining
  - Mold making by graphite electrode
  - For machining raw material of anode
  - lithium ion secondary battery
- Special carbon machining
- Aluminium alloy machining
  - Al6061(Aircraft, frame)
  - Al7075(Aircraft)
  - Al4032(Cylinder head)

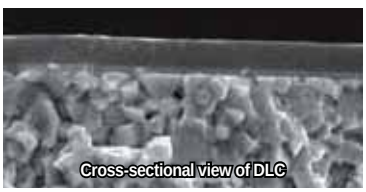
Recommended products

- ▶ Insert for aluminium machining (AK breaker, MA breaker)
- ▶ Endmill for aluminium machining (D-Max)

DLC Coated Grades

Features

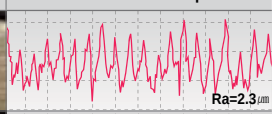
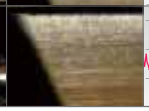
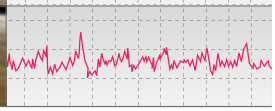
- ▶ Hardness of film is up to Hv 7000, tool life is 3~6times of cemented carbide cutting tool
- ▶ Good surface finish can be acquired due to the lubrication effect that led from low friction co-efficient (< 0.1)
- ▶ Suitable for non-ferrous material machining



Application

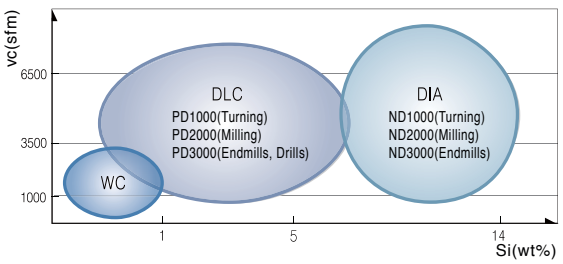
- ▶ For aluminum, carbon, plastic, wood / Insert, drill, endmill

Cutting performance
(Built- up edge / surface finish, FMACM3100R)

Grade \ View	Top face	Major cutting edge	Surface finish of workpiece
Uncoated			
DLC			

- Workpiece : AC2B
- Cutting length : 12m • Cutting condition : vc=1500m/min, fz=0.15mm/t, ap=2mm, Dry

Application range

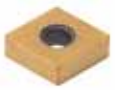


Leader of DLC coated cutting tool for aluminum machining

Brand new cBN insert

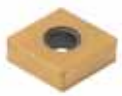
Features

- Excellent hardness and thermal resistance by sintering KORLOY's main constituents and special ceramic binder at high pressure and high temperature
- Excellent hardness and wear resistance for higher productivity in machining cast iron and heat-treated alloy at high speed
- Insert type

High presicion		Wear resistance		Productivity	
					
For regrinding type	One use type	Multi-corner type	Multi-corner type (coated)	Solid type	Grooving type

cBN Application range

Multi edge coated type



2NU-CNGA432

- Easy handling of corners
- Strong Brazing
- Excellent tool life compared to non-coated insertse

One use type

NU-CNGA432

- Economic price. Easy handling of tools
- A wide variety of series
- Smaller than expensive cBN and dramatic cost down
- Strong weld face and stable cutting performance

Multi edge type

2NU-CNGA432

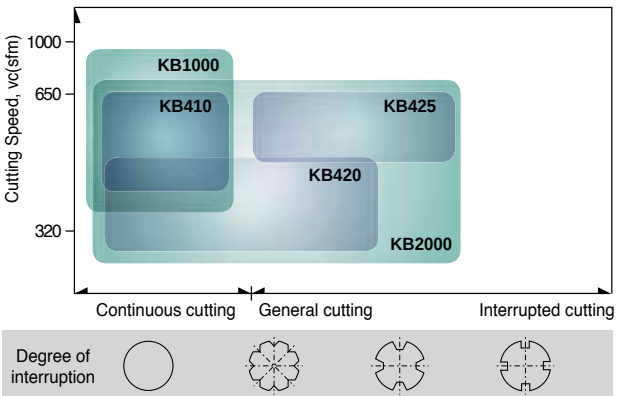
- Price per edge is more reasonable compare to normal single cornered, one-used type
- Insert with several brazed cBN
- Wide application of continuous to interrupted machining

Regrinding type

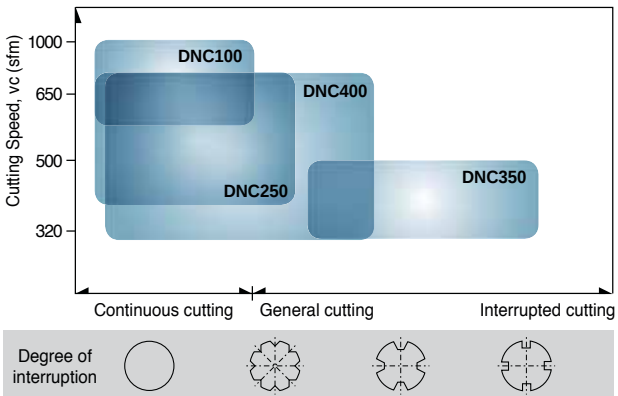
CNMA432

- Long tool life
- Excellent wear resistance, High hardness
- Saved tool cost due to the regrinding insert 3~4 time

cBN Application range



Coated cBN Application range



Cutting conditions of cBN grades

ISO	Grades		Insert color	Application	Cutting Speed vc(sfm) 164 328 492 656 820 984	feed, fn(ipr)	Depth of cut, ap(inch)
H Heat-treated steel	Coated	DNC100 New		Continuous cutting at high speed	591 ~ 984	0.001~0.012	0.001~0.012
		DNC250		Continuous and low interrupted cutting at high speed	394 ~ 722	0.002~0.012	0.002~0.012
		DNC350		Medium and high interrupted cutting	295 ~ 492	0.002~0.012	0.002~0.012
		DNC400 New		Continuous and medium interrupted cutting	295 ~ 722	0.002~0.012	0.002~0.020
	Non-coated	KB410		Continuous cutting at high speed	492 ~ 656	0.001~0.005	0.001~0.008
		KB1000		Continuous cutting at high speed	427 ~ 820	0.001~0.006	0.001~0.008
		KB420		Highly efficient cutting	394 ~ 492	0.001~0.012	0.001~0.020
		KB425		Interrupted cutting at high speed	492 ~ 656	0.001~0.012	0.001~0.020
		KB320		Medium and low interrupted cutting	262 ~ 394	0.001~0.008	0.001~0.012
		KB2000		Medium and low interrupted cutting	262 ~ 656	0.001~0.008	0.001~0.012
		KB335		High interrupted cutting	262 ~ 361	0.001~0.008	0.001~0.012
		KB400		High speed and high depth of cut	394 ~ 722	0.004~0.012	0.020

Solid type cBN

KB400

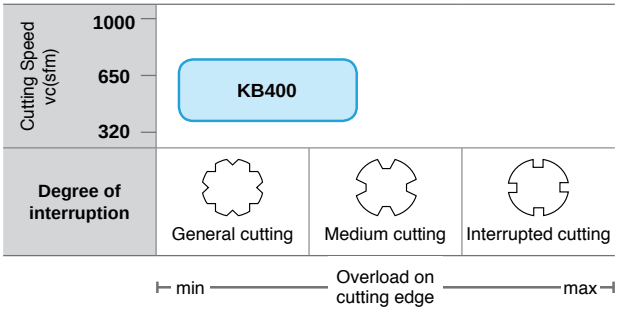
Features

- For medium and light interrupted cutting of heat-treated steel
- Balanced grade of wear resistance and shock resistance
- Solid type for highly efficient machining

Features of solid type

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and machining the welds
- Stable welding with the use of 3-face blazing
- Excellent performance at varying depth of cuts

Application range



Recommended cutting condition

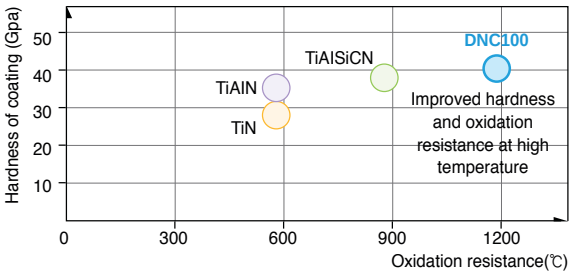
Cutting Speed vc(sfm)	394 ~ 722
feed fn(ipr)	0.004 ~ 0.012
Depth of cut per time ap(inch)	0.020

Coated cBN

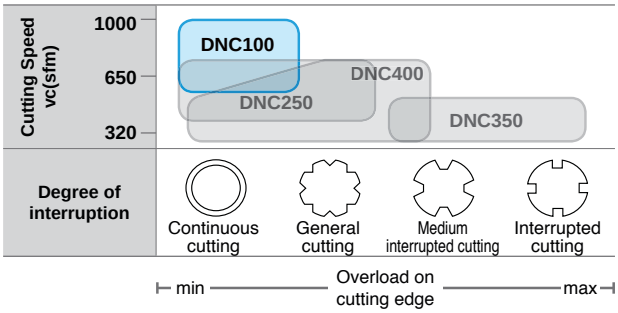
DNC100 New

Features

- Excellent thermal resistance
- Coating layer with high hardness, oxidation resistance and chipping resistance



Application range



Recommended cutting condition

Cutting Speed vc(sfm)	591 – 984
feed fn(ipr)	0.001 – 0.012
Depth of cut ap(inch)	0.001 – 0.012

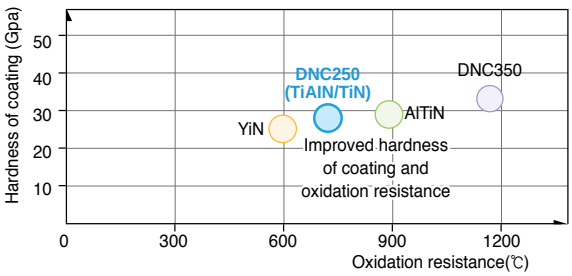
- Increased oxidation resistance and wear resistance due to high hardness coating layer
- Dramatically improved fracture resistance and chipping resistance

Coated Multi-Cornered cBN

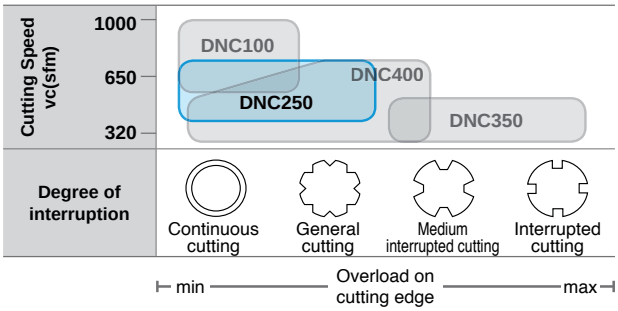
DNC250

Features

- Stable and long tool life
- Cost effective by multi-cornered one-use insert



Application range



Recommended cutting condition

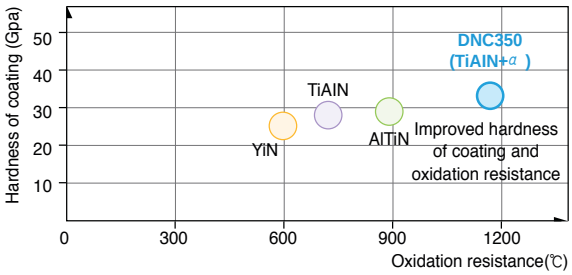
Cutting Speed vc(sfm)	394 – 722
feed fn(ipr)	0.002 – 0.012
Depth of cut ap(inch)	0.002 – 0.012

Coated cBN for high interrupted cutting

DNC350

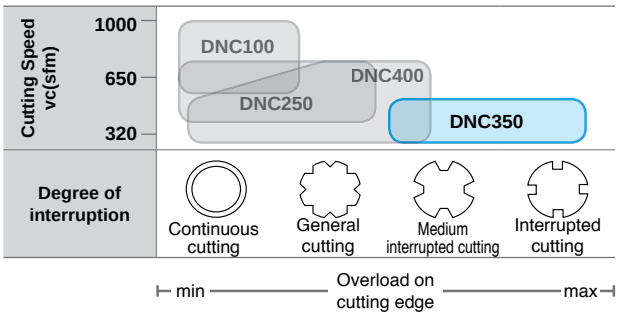
Features

- Excellent tool life and productivity in interrupted cutting
- New PVD coating applied with high hardness and oxidation resistance



- For machining heat-treated steel in continuous and medium interrupted cutting
- Longer tool life due to coating layer
- Solid type for universal purpose

Application range



Recommended cutting condition

Cutting Speed vc(sfm)	295 – 492
feed fn(ipr)	0.002 – 0.012
Depth of cut ap(inch)	0.002 – 0.012

Solid type coated cBN

DNC400 New

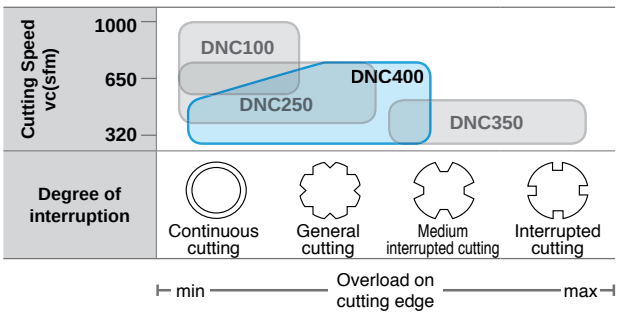
Features

- For machining heat-treated steel in continuous and medium interrupted cutting
- Longer tool life due to coating layer
- Solid type for universal purpose

Features of solid type cBN

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and the welds
- Better welding stability due to 3-face blazing
- Excellent cutting performance at varying depth of cuts

Application range



Recommended cutting condition

feed fn(ipr)	**DNC400**	**0.002 – 0.012**
	DNC250	0.002 – 0.012
	DNC350	0.002 – 0.012
Depth of cut ap(inch)	**DNC400**	**0.002 – 0.020**
	DNC250	0.002 – 0.012
	DNC350	0.002 – 0.012

Non-coated cBN

KB1000

Features

- Non-coated cBN with the highest wear resistance at high speed
- Excellent tool life in continuous to light interrupted cutting
- Improved fracture resistance along with high wear resistance
  - Higher thermal resistance and hardness due to pure TiCN ceramic binder

Non-coated cBN

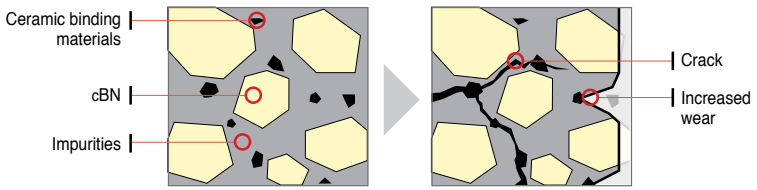
KB2000

Features

- Universal grade for overall machining of heat-treated
- Stable tool life in continuous to low/medium interrupted cutting
- Both fracture resistance and wear resistance acquired with the use of pure ceramic binder
- Stable surface roughness

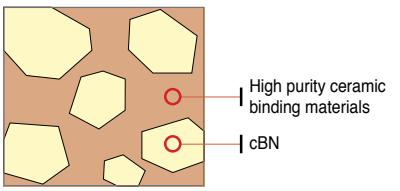
New technology of high purity ceramic binding materials

Conventional grade



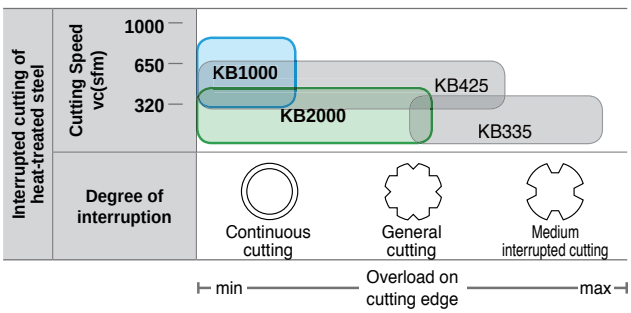
Impurities included in conventional grade's ceramic binder caused inferior thermal resistance and hardness of sintered compounds, which led to crack(fracture) and wear

KB1000 / KB2000



KB2000 dramatically minimizes impurities with the use of high purity ceramic binding materials and enhances thermal resistance and toughness.

Application range



Recommended cutting condition (KB1000)

Cutting Speed vc(sfm)	427 – 820
feed fn(ipr)	0.001 – 0.006
Depth of cut ap(inch)	0.001 – 0.008

Recommended cutting condition (KB2000)

Cutting Speed vc(sfm)	262 – 656
feed fn(ipr)	0.001 – 0.008
Depth of cut ap(inch)	0.001 – 0.012

Technical information for PCD insert

Features

KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure.
The PCD tip is welded on the qualified KORLOY carbide insert
KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- ▶ Excellent tool life for aluminum alloy and copper alloy
- ▶ Excellent tool life for Ceramic, high-silicon aluminum and rock or stone
- ▶ Excellent tool life for rubber, carbon, graphite and wood

PCD Grade

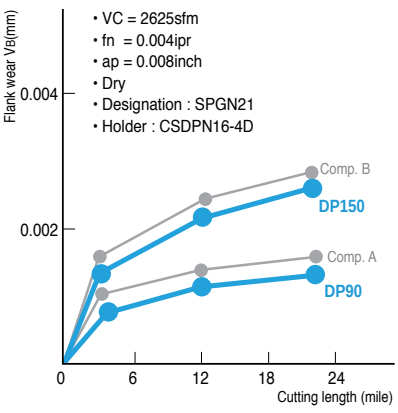
Grade	Features	Application	Grain size(㎛)	Hardness(Hv)	TRS(kgf/mm²)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000 ~ 12,000	110
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5	10,000 ~ 12,000	200
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine non-ferrous material	Plastic Wood Precise finishing of aluminum	0.5	8,000 ~ 10,000	220

Recommended cutting condition

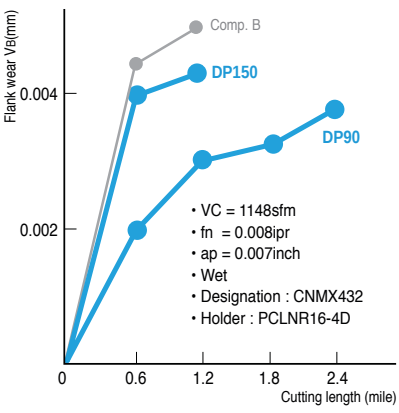
Workpiece	Cutting speed (sfm)	Feed (ipr)	Depth of cut (inch)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8% Si)	3281~9843	0.004~0.024	~0.118	DP150	DP200
Aluminum alloy (9%~14% Si)	1969~8202	0.004~0.020	~0.118	DP150	DP200
Aluminum alloy (15%~18% Si)	984~2297	0.004~0.016	~0.118	DP150	DP200
Copper, Bronze alloy	~3281	0.002~0.008	~0.118	DP150	DP200
Reinforced plastic	~3281	0.004~0.012	~0.08	DP150	DP200
Wood	~13123	0.004~0.016	-	DP150	DP200
Cemented carbide	33~98	~0.008	~0.02	DP90	DP150

Cutting performance

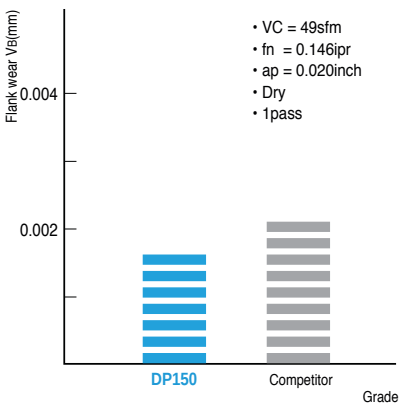
Continuous cutting test(Workpiece:Al-25%Si)



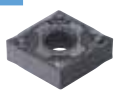
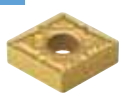
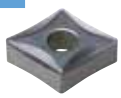
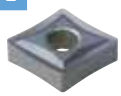
Interrupted cutting test(Workpiece:Al-20%Si)



Cutting test of cemented carbide

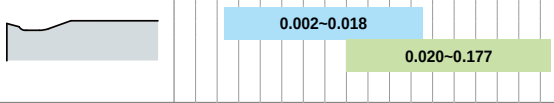
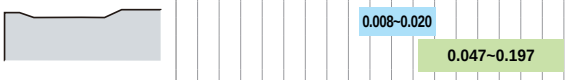
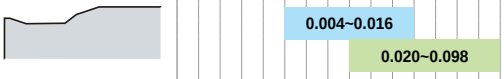
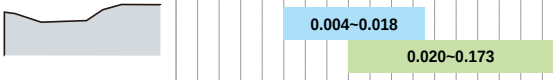
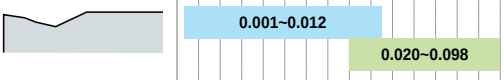
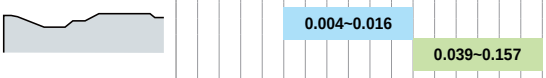
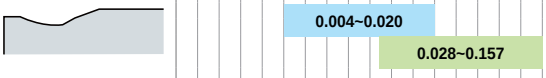
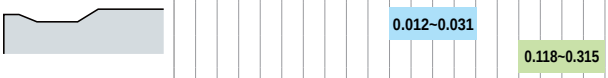
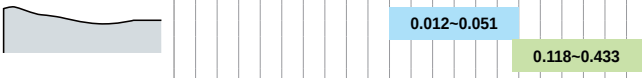


KORLOY Chip Breaker For Turning

Geometry	Cutting edge	Application range	Features
		feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
V Series			
VG 		0.004~0.014 0.020~0.098	**For finishing** • Ensures stable chip flow even at very small depth of cut • Suitable for copying
VQ 		0.004~0.016 0.039~0.118	**For Medium to Finish Cutting** • Strong cutting edge makes excellent cutting performance at interrupted cutting
VL 		0.004~0.014 0.008~0.059	**For Finishing** • Stable chip control in high toughness material; low carbon steel, pipe steel & steel plates • Improved chip control for facing, copy machining and better surface finish
VF 		0.002~0.014 0.020~0.059	**For Finishing** • Good chip control quality on varied depth of cut • Excellent cutting edge strength has been acquired due to the special chip-breaker
VB 		0.006~0.018 0.020~0.079	**For Finishing** • Improved chip control for smaller depth of cuts • Excellent chip control in copying, corner R machining
VC 		0.005~0.018 0.020~0.138	**For Medium to Finish Cutting** • Stable chip control in copying and internal machining with various depths of cut
VM 		0.004~0.020 0.039~0.197	**For Medium cutting** • Wide available chip control range from medium-finishing to medium-roughing • Suitable chip breaker for CNC machining
VK 		0.006~0.020 0.039~0.197	**For Medium to Roughing of Milling** • Optimal for high speed machining and interrupted machining
VH 		0.028~0.055 0.236~0.591	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
VT 		0.030~0.063 0.276~0.669	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
VP1 		0.002~0.008 0.004~0.059	**For Finishing** • High positive cutting edge • Reduced contract chip minimizes temperature to improve tool life
VP2 		0.002~0.016 0.020~0.157	**For Medium to Finish Cutting** • Stable chip control and high machinability in copying with various depths of cut

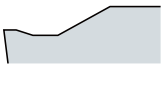
Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
V Series	VP3			**For Medium cutting** • High positive cutting edge with wide land • Stable cutting performance in interrupted machining with high toughness • Stable machinability and chip control in machining with high depth of cut
	VR			**For Medium cutting of cast iron and Medium to Roughing of steel** • High feed machining with the combination of wide land and pockets • Shallow chip breaker design prevents chip blocking at high feed • Decreased wear on major cutting edge due to special treatment on blade
-P Series	LP			**For Medium to Finish cutting of steel** • Angle land decreases cutting resistance for better surface roughness • Special dot design prevents chip blocking by clear chip breaking
	MP			**For Medium cutting** • Increased productivity due to excellent chip control in various conditions • Stable tool life by reducing cutting load at high speed and high feed
H Series	HR			**For Light-alloy, Stainless-steel machining** • Sharp cutting edge generates low cutting force • Specially designed tough main cutting edge • Suitable for cutting of low carbon steel, stainless steel, aluminum
	HA			**For Light-alloy, Stainless-steel machining** • Sharp cutting edge generates low cutting force • Specially designed tough main cutting edge • Suitable for cutting of low carbon steel, stainless steel, aluminum
	HS			**For Medium cutting of Stainless steel** • Exclusive design for stainless steel cutting provide longer tool life • Wear resistance have been reinforced through high rake angle of chip breaker land
G Series	GM			**For Medium to Light cutting** • Excellent chip control at general cutting conditions • Strong cutting edge strength provides good performance at intermittent and fast feed cutting
	GR			**For Medium to Roughing** • Suitable for deep depth of cut and high feed cutting of steel and cast iron • Suitable for intermittent cutting
	GH			**For Heavy duty cutting** • Suitable for heavy duty cutting due to strong cutting edge • Wide chip control range with low cutting force
	GS			**For Medium to Roughing of Stainless-steel** • Exclusive chip breaker for stainless steel
B Series	B25			**For General cutting** • Suitable for general cutting condition cutting

Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
V-Posi Series	VF		0.002~0.010 0.004~1.059	**For Finishing** • Improved surface finish and size accuracy due to stable inner boring
V-Posi Series	VL		0.002~0.008 0.004~0.039	**For Finishing** • Superior chip control in low carbon steel, pipes, and steel plates
V-Posi Series	VP1		0.001~0.010 0.004~0.059	**For Finishing** • Excellent chip control in application with micro depth of cut and low feed • Low cutting load and superb surface finish • Optimal for both internal and external machining
H-Posi Series	HMP		0.001~0.016 0.020~0.138	**For Medium cutting** • Excellent chip control at wide range of cutting conditions • Suitable for stainless steel cutting
C Series	C25		0.004~0.014 0.039~0.118	**For Medium cutting** • Suitable for interrupted cutting and cast iron machining • Good surface finish due to low cutting force • Suitable for both boring and outer diameter turning
P-Posi Series	MP		0.002~0.012 0.012~0.118	**For Medium cutting** • Sharp cutting edge and wide chip pocket for low cutting load • Stable chip control at varying depth of cuts • Excellent cutting performance when machining automobile components
AL Series	AK		0.001~0.016 0.004~0.157	**For Aluminum cutting** • High rake angle and low resistance cutting edge secures long tool life in continuous cutting of aluminum turning • High speed of finishing operation
AL Series	AR		0.002~0.020 0.020~0.157	**For Aluminum cutting** • High stability of cutting edge secures great performance in high speed and interrupted machining • High speed of medium and interrupted operation
Auto tool Series	KF		0.001~0.005 0.001~0.039	**For Finishing** • Shallow depth of cut with sharp edge. • Longer tool life at high speed cutting due to low cutting force • Good surface finish
Auto tool Series	KM		0.002~0.006 0.002~0.059	**For Medium to Finish Cutting** • Improved chip control makes tool life long and better machining
Wiper tool Series	LW		0.006~0.024 0.039~0.197	**For Medium cutting(Wiper)** • Guarantees excellent surface roughness and good chip controls at high feed machining
Wiper tool Series	VW		0.006~0.020 0.020~0.138	**For Finishing(Wiper)** • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge

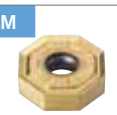
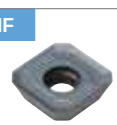
Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
MX Series	MX		0.004~0.012 0.039~0.197	**For General Milling** • Possible to increase productivity through increase feed and depth • Excellent heat resistance due to the special chip breaker design of top face of insert
RichMill Series-RM3	MA		0.002~0.016 0.039~0.315	**For Aluminum Milling** • Sharp cutting edge for low cutting load, which is ideal for machining steel, hard-to-cut materials and aluminum
	ML		0.002~0.012 0.039~0.315	**For machining Hard-to-cut materials** • Low cutting resistance for light cutting and machining hard-to-cut materials with excellent tool life and surface roughness
	MM		0.002~0.014 0.039~0.315	**For Medium to Roughing** • Available for most of applications with universal design for general milling
RichMill Series-RM4	MA		0.002~0.010 0.012~0.551	**For Aluminum Milling** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF		0.002~0.012 0.020~0.551	**For Finishing of Milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.002~0.012 0.039~0.551	**For Medium to Roughing of Milling** • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RM8	MA		0.002~0.014 0.012~0.236	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF		0.002~0.014 0.012~0.236	**For Finishing of Milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML		0.002~0.012 0.012~0.236	**For machining Hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM		0.004~0.016 0.020~0.236	**For Medium to Roughing of Milling** • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RMT	MF		0.002~0.008 0.020~0.197	**For Finishing of Milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining

Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range (feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 / depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512)	Features
RichMill Series-RMT	MM 		0.002~0.012 0.020~0.315	**For Medium to Roughing of Milling** • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RM16	MA 		0.002~0.012 0.012~0.217	**For Aluminum** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF 		0.002~0.008 0.012~0.217	**For Finishing of Milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML 		0.002~0.014 0.012~0.217	**For machining Hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM 		0.004~0.018 0.020~0.217	**For Medium to Roughing of Milling** • Suitable geometry design for general milling has wider ranges of machining
	W 		0.002~0.012 0.012~0.079	**For Finishing of Milling (Wiper)** • Wiper insert provides improved surface roughness due to special cutting edge
Alpha Mill Series	MA 		0.004~0.016 0.020~0.630	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF 		0.002~0.006 0.020~0.630	**For Finishing of Milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM 		0.004~0.010 0.020~0.630	**For Medium to Roughing of Milling** • Suitable geometry design for general milling has wider ranges of machining
	ML 		0.002~0.006 0.020~0.630	**For hard-to-cut material machining** • The chip breaker with low cutting resistance ensures superior machinability in hard-to-cut materials
Futur Mill Series	MF 		0.002~0.008 0.020~0.197	**For Finishing of Milling** • Special design for light cutting of gummy materials like stainless steel and hard to machine material provide fine surface finish and longer tool life
	MM 		0.002~0.012 0.039~0.197	**For Medium cutting of Milling** • Chip breaker design to cover general cutting condition provides wide available application range • Ground type and as sintered type is available

Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
Futur Mill Series	MR 		0.002~0.014 0.059~0.197	**For Roughing of Milling** • Strongest cutting edge strength provide stable tool life even in case of severe cutting with heavy intermittent and heavy roughing
	MA 		0.004~0.014 0.020~0.197	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
Futur Mill Series P-Posi	MA 		0.012~0.236 0.012~0.236	**For Aluminum Milling** • Excellent surface roughness due to buffed surface in machining aluminum
	ML 		0.012~0.020 0.012~0.118	**For machining Titanium and Inconel** • Low cutting resistance and high hardness cutting edges for excellent surface roughness in machining titanium and Inconel
	MF 		0.005~0.020 0.012~0.236	**For Medium cutting** • Low cutting resistance for light cutting
	MM 		0.008~0.028 0.012~0.236	**For Medium to Rough Milling** • Universal purpose for most of milling applications
	None C/B 		0.012~0.020 0.012~0.020	**For machining high hardness steel** • Ideal for machining high hardness mold steel and heat resistant alloy

Notice : Application ranges are based on main cutting material

KORLOY Chip Breaker For Drilling

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
KING DRILL Series	PD 		0.002~0.008 2.362~11.811	**For general steel machining** • Chip breaker with strong cutting edge for universal applications with steel, stainless steel, and cast iron
	ND 		0.002~0.039 3.937~15.748	**Non-ferrous metals** • Chip breaker with sharp and polished cutting edge for aluminum and non-ferrous metals. Machining with King Drill ensures good chip flow and resistance to chip welding.
	LD 		0.002~0.006 1.575~9.843	**For general steel (mild steel and forged steel)** • Superior chip control in machining of mild steel, forged steel and stainless steel

Notice : Application ranges are based on main cutting material

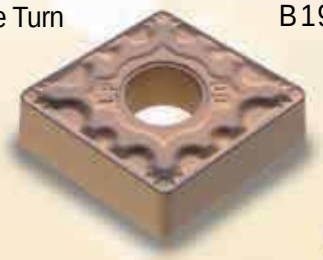
Turning Chip Breakers

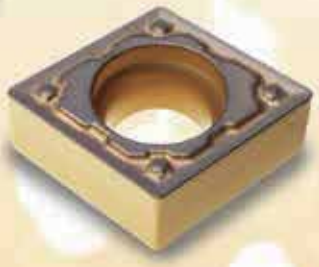
Inserts

External Tool Holder

Boring Bar

TURNING





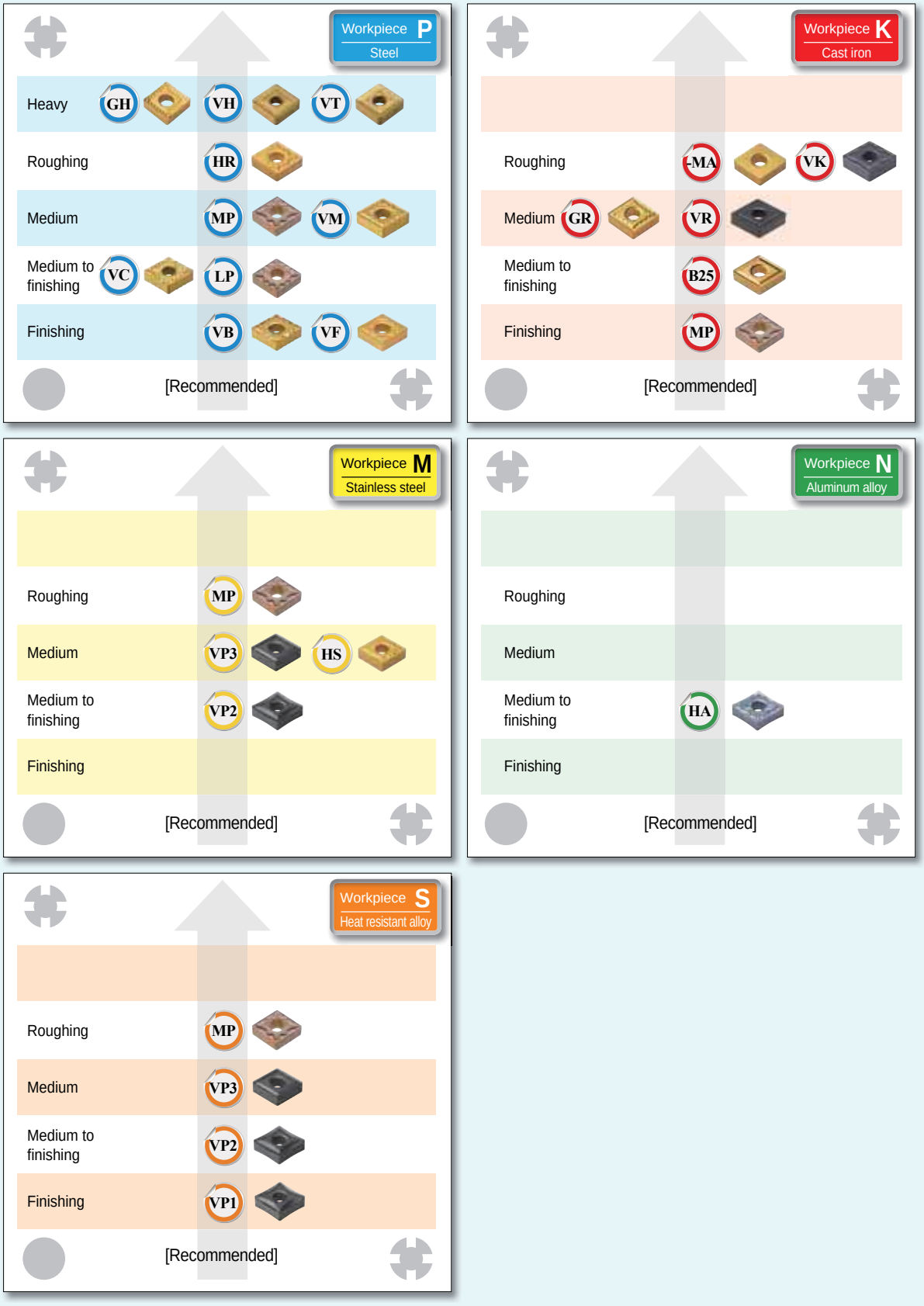
B

TURNING

Korloy turing tools cover a wide application range with a full line-up of ISO tools that produce high quality and high precision parts for all manufacturers requirements.

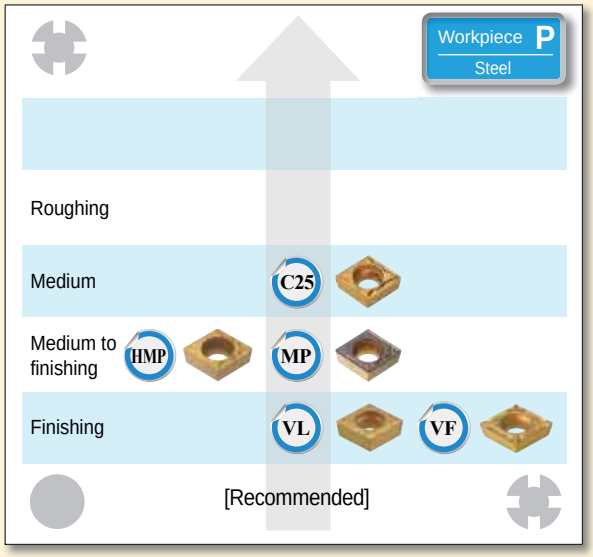
Applications range of chip breakers

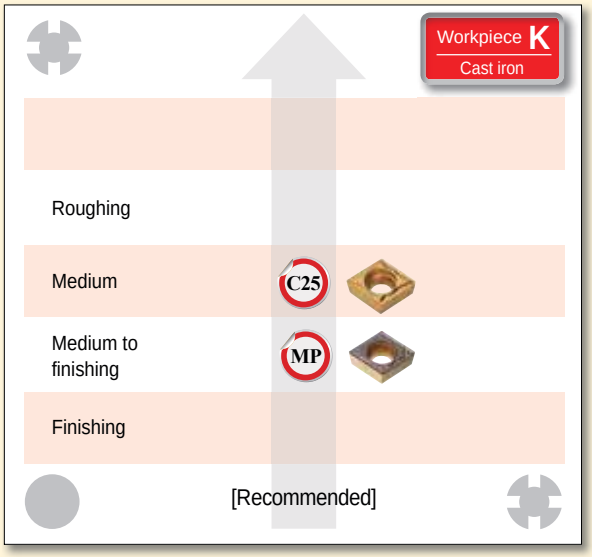
Negative inserts

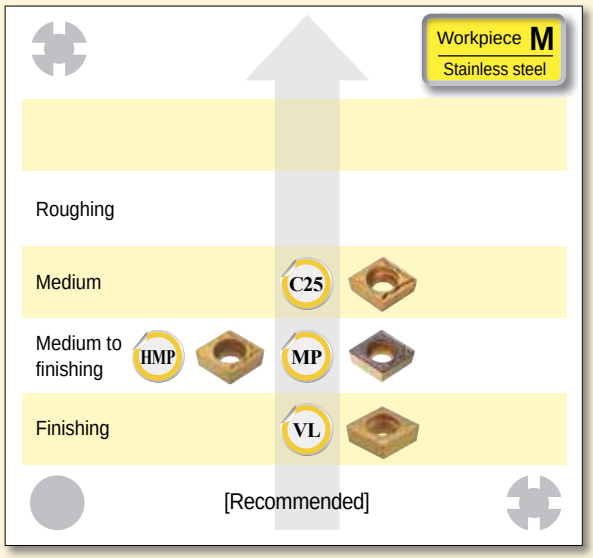


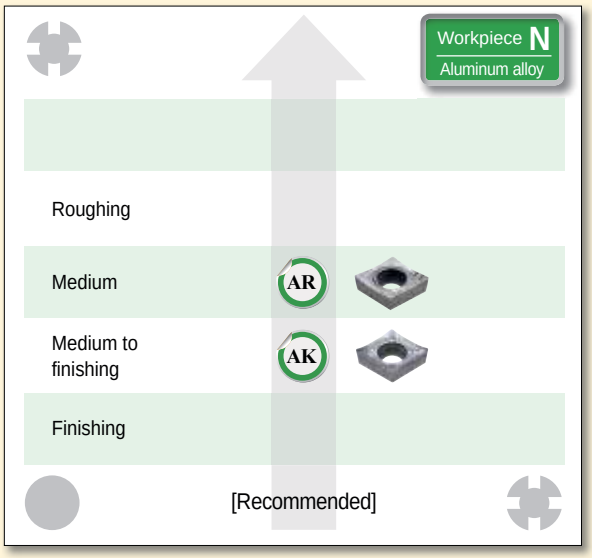
Applications range of chip breakers

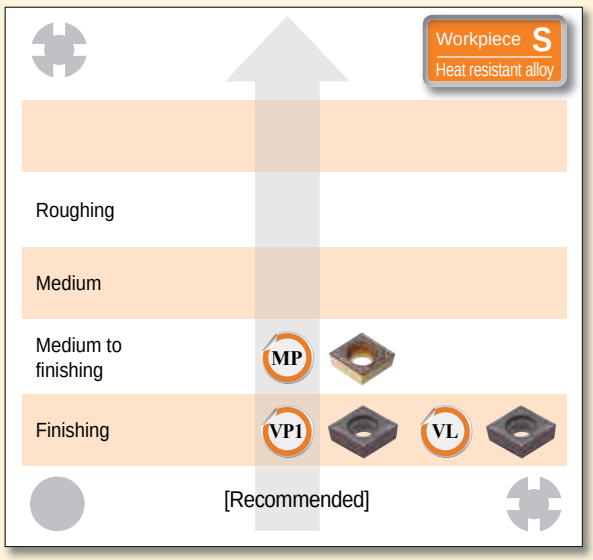
Positive inserts











Recommended chip breaker for workpiece

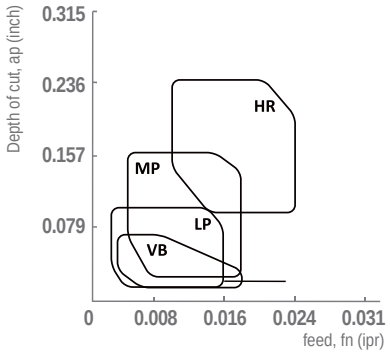
Workpiece **P** Steel

Materials : 1010, 1015, 1025, 8615, 5120, 4130
Hardness : under 180HB

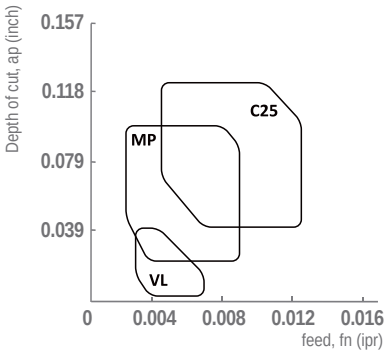
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.008 ~ 0.031 ~ 0.059 finishing	VL		0.004 ~ 0.008 ~ 0.014	NC3215 NC3225 CN1500 CN2500	1000 820 853 755	CNMG p. B20	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.020 ~ 0.039 ~ 0.059 finishing	VF		0.002 ~ 0.006 ~ 0.014	NC3215 NC3220 NC3225 NC5330	1000 886 886 689	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.020 ~ 0.039 ~ 0.079 finishing	VB		0.006 ~ 0.008 ~ 0.016	NC3215 NC3225 CN1500 CN2500	1115 820 787 689	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	0.020 ~ 0.059 ~ 0.138 medium to finishing	VC		0.005 ~ 0.010 ~ 0.018	NC3215 NC3220 NC3225 NC5330	935 820 837 656	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.020 ~ 0.039 ~ 0.098 medium to finishing	LP		0.004 ~ 0.010 ~ 0.016	NC3215 NC3225	984 820	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.020 ~ 0.059 ~ 0.177 medium to finishing	MP		0.006 ~ 0.012 ~ 0.018	NC3215 NC3225	984 869	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.039 ~ 0.098 ~ 0.197 medium to finishing	VM		0.004 ~ 0.010 ~ 0.020	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	968 853 853 673 722 656	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.098 ~ 0.157 ~ 0.276 roughing	HR		0.010 ~ 0.018 ~ 0.026	NC3215 NC3220 NC3225 NC5330	886 787 787 623	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	0.236 ~ 0.394 ~ 0.591 Heavy (General)	VH		0.028 ~ 0.039 ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			
	0.276 ~ 0.472 ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ 0.047 ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			

● : The first recommended cutting condition

P Negative



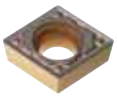
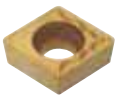
P Positive



Recommended chip breaker for workpiece

Workpiece P Steel

Materials : 1010, 1015, 1025, 8615, 5120, 4130
Hardness : under 180HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.004 ~ **0.020** ~ 0.039 finishing	VL 		0.002 ~ **0.004** ~ 0.008	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1000 886 886 689 853 787	CCMT  p. B58	DCMT  p. B62	SCMT  p. B64	TCMT  p. B68	VB(C)MT  p. B74(B76)	
	0.004 ~ **0.020** ~ 0.059 finishing	VF 		0.020 ~ **0.006** ~ 0.010	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	1000 886 886 689 853 820 755	CCMT  p. B57	DCMT  p. B62	SCMT  p. B64	TC(P)MT  p. B68(B72)	VB(C)MT  p. B74(B76)	
	0.020 ~ **0.039** ~ 0.118 medium to finishing	MP 		0.039 ~ **0.008** ~ 0.014	NC3215 NC3225 CN1500 CN2500	984 820 787 656	CCMT  p. B58	DCMT  p. B62	SCMT  p. B64	TC(P)MT  p. B68(B72)	VB(C)MT  p. B73(B76)	
	0.020 ~ **0.059** ~ 0.118 medium to finishing	HMP 		0.003 ~ **0.008** ~ 0.016	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1050 935 935 738 787 656	CCMT  p. B58	DCMT  p. B62	SCMT  p. B64	TCMT  p. B68	VB(C)MT  p. B73(B76)	
	0.039 ~ **0.079** ~ 0.118 medium	C25 		0.004 ~ **0.010** ~ 0.014	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1050 935 935 738 755 689	CCMT  p. B58	DCMT  p. B62	SCMT  p. B64	TCMT  p. B69		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials : 1045, 1049, 4140, 1522
Hardness : under 180~260HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.039 ~ 0.059 finishing	VF		0.002 ~ 0.006 ~ 0.014	NC3215 NC3225 NC5330	1000 886 820	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.020 ~ 0.039 ~ 0.079 finishing	VB		0.006 ~ 0.008 ~ 0.016	NC3215 NC3225 CN1500 CN2500	1115 820 755 623	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	0.020 ~ 0.039 ~ 0.098 medium	LP		0.004 ~ 0.010 ~ 0.016	NC3215 NC3225	984 820	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B47	WNMG p. B52
	0.020 ~ 0.059 ~ 0.177 medium	MP		0.006 ~ 0.012 ~ 0.018	NC3215 NC3225	984 820	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.020 ~ 0.059 ~ 0.138 Medium to finishing	VC		0.005 ~ 0.010 ~ 0.018	NC3215 NC3220 NC3225 NC5330	935 837 820 656	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.039 ~ 0.098 ~ 0.197 medium	VM		0.004 ~ 0.010 ~ 0.002	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	853 804 804 673 689 558	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.098 ~ 0.157 ~ 0.276 Roughing	HR		0.010 ~ 0.018 ~ 0.026	NC3215 NC3220 NC3225 NC5330	886 787 787 623	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	0.236 ~ 0.394 ~ 0.591 Heavy (General)	VH		0.028 ~ 0.039 ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			
	0.276 ~ 0.472 ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ 0.047 ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			
Positive	0.004 ~ 0.020 ~ 0.039 finishing	VL		0.002 ~ 0.004 ~ 0.008	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1132 1017 1017 787 820 689	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B61	VB(C)MT p. B74(76)	
	0.004 ~ 0.020 ~ 0.059 finishing	VF		0.002 ~ 0.006 ~ 0.010	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	869 984 984 755 853 787 689	CCMT p. B57	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VCMT p. B74(B76)	
	0.012 ~ 0.059 ~ 0.118 Medium to finishing	MP		0.002 ~ 0.006 ~ 0.014	NC3215 NC3225	984 820	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	0.039 ~ 0.079 ~ 0.118 medium	C25		0.004 ~ 0.010 ~ 0.014	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1050 935 935 738 755 656	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece P Steel

Materials : 4320, 4340, 5140, F2, D3, 4140, Hardened steel
Hardness : 260~350HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ **0.039** ~ 0.059 finishing	VF		0.003 ~ **0.006** ~ 0.012	NC3215 NC3220 NC3225	591 522 522	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.020 ~ **0.039** ~ 0.079 finishing	VB		0.006 ~ **0.008** ~ 0.016	NC3215 NC3225 CN1500 CN2500	656 486 722 656	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	0.020 ~ **0.059** ~ 0.138 Medium to finishing	VC		0.005 ~ **0.010** ~ 0.018	NC3215 NC3220 NC3225 NC5330	551 486 492 656	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.020 ~ **0.039** ~ 0.098 medium	LP		0.004 ~ **0.010** ~ 0.016	NC3215 NC3225	820 656	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.020 ~ **0.059** ~ 0.177 medium	MP		0.006 ~ **0.012** ~ 0.018	NC3215 NC3225	820 656	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B52
	0.039 ~ **0.098** ~ 0.197 medium	VM		0.004 ~ **0.010** ~ 0.002	NC3215 NC3220 NC3225 CN1500 CN2500	571 502 502 394 328	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.098 ~ **0.157** ~ 0.276 Roughing	HR		0.010 ~ **0.014** ~ 0.024	NC3215 NC3220 NC3225 NC5330	522 466 466 367	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	0.236 ~ **0.394** ~ 0.591 Heavy (General)	VH		0.028 ~ **0.039** ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			
	0.276 ~ **0.472** ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ **0.047** ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B25		SNMM p. B39			
Positive	0.004 ~ **0.020** ~ 0.039 finishing	VL		0.002 ~ **0.004** ~ 0.008	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1000 1017 1017 787 689 623	CCMT p. B58	DCMT p. B62	SCMT p. B63	TCMT p. B68	VB(C)MT p. B74(B76)	
	0.004 ~ **0.020** ~ 0.059 finishing	VF		0.002 ~ **0.006** ~ 0.010	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	1083 984 984 755 853 820 787	CCMT p. B57	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B74(B76)	
	0.012 ~ **0.059** ~ 0.118 Medium to finishing	MP		0.002 ~ **0.006** ~ 0.014	NC3215 NC3225 NC5300 CN1500 CN2500	1000 935 738 787 722	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	0.039 ~ **0.079** ~ 0.118 medium	C25		0.004 ~ **0.010** ~ 0.014	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1020 935 935 738 328 262	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

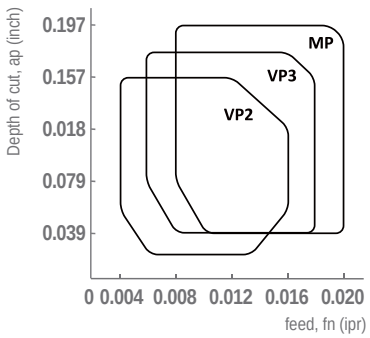
Workpiece **M** Stainless steel

Materials : 304, 316, 430, 630
Ferrite, austenite, martensite, precipitation hardening stainless steels
Hardness : 135~300HB

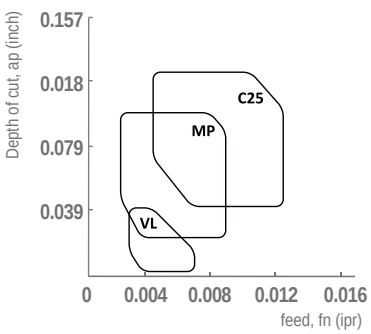
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ **0.059** ~ 0.157 Medium to finishing	VP2		0.004 ~ **0.008** ~ 0.016	PC8105 PC8110 PC8115 PC5300 PC5400	607 558 525 443 394	CNMG p. B22	DNMG p. B29	SNMG p. B36	TNMG p. B45		WNMG p. B52
	0.039 ~ **0.079** ~ 0.177 medium	VP3		0.004 ~ **0.010** ~ 0.018	PC8105 PC8110 PC8115 PC5300 PC5400	574 525 492 427 361	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.039~ **0.098** ~ 0.157 medium	HS		0.004 ~ **0.008** ~ 0.016	PC8110 PC5300 PC9030	525 459 443	CNMG p. B21	DNMG p. B30	SNMG p. B36	TNMG p. B44	VNMG p. B50	WNMG p. B52
	0.020 ~ **0.059** ~ 0.177 Roughing	MP		0.006 ~ **0.012** ~ 0.018	PC8105 PC8110 PC8115 PC5300	640 525 492 427	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
Positive	0.004 ~ **0.020** ~ 0.039 finishing	VL		0.002 ~ **0.004** ~ 0.008	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	705 640 623 541 443 541 541	CCMT p. B57	DCMT p. B62	SCMT p. B64	TCMT p. B68	VB(C)MT p. B73(B76)	
	0.012 ~ **0.059** ~ 0.118 Medium to finishing	MP		0.002 ~ **0.006** ~ 0.014	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	623 574 558 443 394 492 492	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	0.039 ~ **0.079** ~ 0.118 medium	C25		0.004 ~ **0.010** ~ 0.014	PC8110 PC5300 PC9030	558 509 509	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

M Negative



M Positive



Recommended chip breaker for workpiece

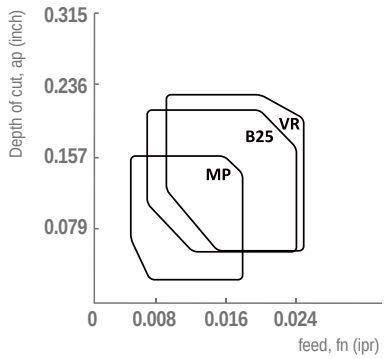
Workpiece
K
Cast iron

Materials : No208B, No55B, 60-40-18, 80-55-06, etc : Gray cast iron, Ductile cast iron
Hardness : 135 ~185HB
Tensile strength : 450N/mm²

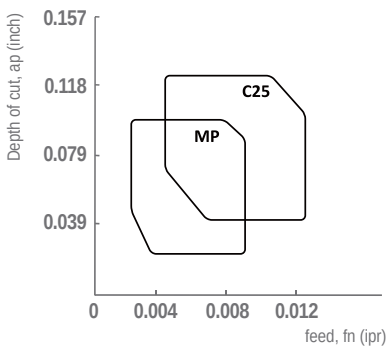
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.039 ~ **0.098** ~ 0.236 Roughing	C/B no		0.002 ~ **0.004** ~ 0.024	KB410 KB350 KB370 NC6205 NC6210 NC6215	492~656 656~1640 1640~6560 558~1378 459~1148 394~951	CNMA p. B20	DNMA p. B26	SNMA p. B34	TNMA p. B42		
	0.039 ~ **0.098** ~ 0.197 Roughing	VK		0.006 ~ **0.010** ~ 0.020	NC6205 NC6210 NC6215	1476~1804 1148~1476 656~820	CNMG p. B23	DNMG p. B30	SNMG p. B38	TNMG p. B47	VNMG p. B50	WNMG p. B54
	0.039 ~ **0.118** ~ 0.177 Roughing	VR		0.008 ~ **0.014** ~ 0.024	NC6215	656~820	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	0.039 ~ **0.118** ~ 0.177 medium to roughing	GR		0.008 ~ **0.014** ~ 0.020	NC6205 NC6210 NC6215	591~1214 492~1083 427~917	CNMG p. B23	DNMG p. B30	SNMG p. B38	TNMG p. B46		WNMG p. B54
	0.020 ~ **0.079** ~ 0.138 Medium to finishing	B25		0.008 ~ **0.014** ~ 0.024	NC6205 NC6210 NC6215	558~1247 459~1050 394~951	CNMG p. B23	DNMG p. B30	SNMG p. B37	TNMG p. B46		
	0.020 ~ **0.039** ~ 0.098 finishing	MP		0.004 ~ **0.010** ~ 0.016	NC6215	656~820	CNMG p. B22	DNMG p. B22	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
Positive	0.012 ~ **0.059** ~ 0.118 Medium to finishing	MP		0.004 ~ **0.008** ~ 0.014	NC6215	656~820	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68	VB(C)MT p. B74(B76)	
	0.039 ~ **0.079** ~ 0.138 medium	C25		0.004~ **0.010** ~ 0.016	NC6205 NC6210 NC6215	1115 935 656	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

K Negative



K Positive



Recommended chip breaker for workpiece

Workpiece **N** Aluminum alloy

Materials : Aluminum alloy
Hardness : 20~110HB

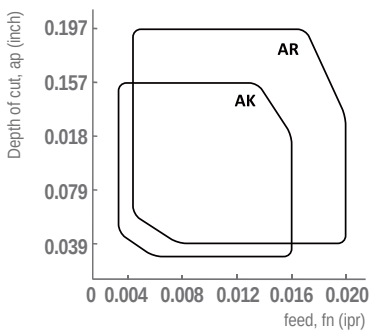
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.079 ~ 0.236 medium	HA		0.004 ~ 0.008 ~ 0.020	H01	1640	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
Positive	0.004 ~ 0.039 ~ 0.157 Medium to finishing	AK		0.001 ~ 0.008 ~ 0.016	H01 ND1000 PD1000	3281 3281 3281	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82
	0.020 ~ 0.059 ~ 0.157 medium	AR		0.002 ~ 0.012 ~ 0.020	H01 ND1000 PD1000	3281 3281 3281	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82

Materials : Copper Bronze alloy
Hardness : 20~110HB

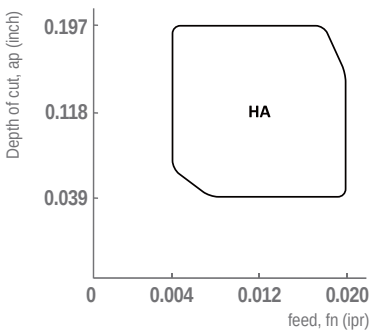
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.079 ~ 0.157 Medium to finishing	HA		0.004 ~ 0.008 ~ 0.020	H01	3281	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
Positive	0.004 ~ 0.039 ~ 0.118 Medium to finishing	AK		0.001 ~ 0.008 ~ 0.012	H01	3281	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82
	0.020 ~ 0.059 ~ 0.118 medium	AR		0.002 ~ 0.010 ~ 0.016	H01	3281	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B87)	RCGT p. B82

● : The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

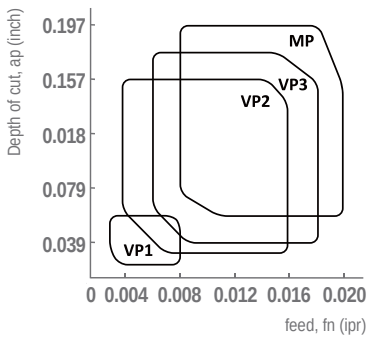
Workpiece **S** Heat resistant alloy

Materials : Inconel, Nimonic, Stellite, Ti alloy
Hardness : 160~350HB

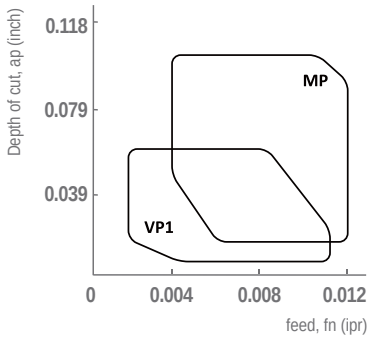
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.004 ~ **0.020** ~ 0.059 finishing	VP1		0.002 ~ **0.004** ~ 0.008	PC8110 PC5300 NC5330	197 164 164	CNGG p. B20	DNGG p. B26				
	0.020 ~ **0.059** ~ 0.157 Medium to finishing	VP2		0.004 ~ **0.008** ~ 0.016	PC8110 PC5300	197 148	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44		WNMG p. B52
	0.039 ~ **0.079** ~ 0.177 medium	VP3		0.004~ **0.010** ~ 0.018	PC8110 PC5300	197 131	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.059 ~ **0.079** ~ 0.177 Roughing	MP		0.006 ~ **0.012** ~ 0.018	PC8110 PC8115	197 164	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.059 ~ **0.118** ~ 0.217 Roughing	GS		0.006 ~ **0.012** ~ 0.020	PC8110 PC5300	164 148	CNMG p. B23	DNMG p. B30	SNMG p. B37	TNMG p. B46		WNMG p. B53
Positive	0.004 ~ **0.020** ~ 0.059 finishing	VP1		0.002 ~ **0.004** ~ 0.008	PC8110 PC5300	197 148	CCGT p. B57	DCGT p. B61			VCGT p. B75	
	0.004 ~ **0.020** ~ 0.039 finishing	VL		0.002 ~ **0.004** ~ 0.008	PC8110 PC8115	197 164	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B68	VCMT p. B74(B76)	
	0.020 ~ **0.039** ~ 0.118 medium	MP		0.004 ~ **0.008** ~ 0.014	PC8110 PC8115	197 164	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68	VB(C)MT p. B74(B76)	

● : The first recommended cutting condition

S Negative



S Positive



New Chip Breakers

LP Chip Breaker [For medium cutting to finishing]

- Chip breaker for forged steel of automobile parts and normal steel.
- Quad dots improve productivity through efficient chip control at high feed.
- Angle land minimizes cutting force.

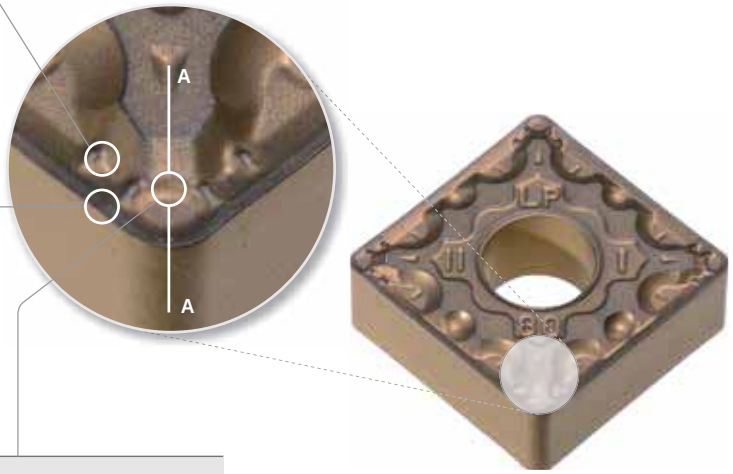
Features of LP chip breaker

▶ Front dot

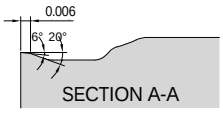
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed

▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge



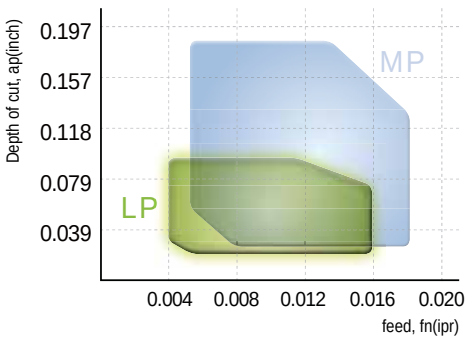
▶ Flat zone



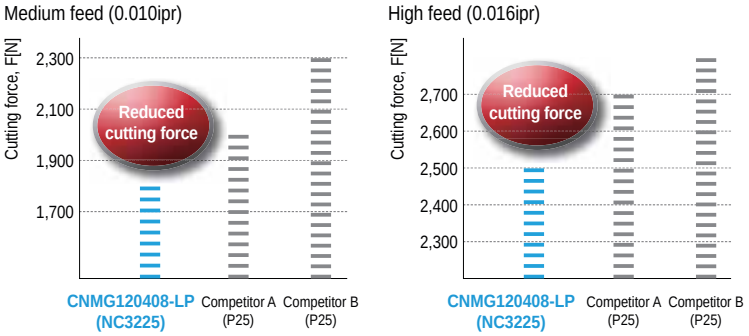
- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

Application Range

(Medium to finish cutting)



Cutting performance



New Chip Breakers

MP Chip Breaker [For medium cutting]

- Chip breaker for forged steel of automobile parts and all other steels.
- Quad dots improve productivity through efficient chip control at high feed.
- Angle land minimizes cutting force.

Features of MP Chip Breaker

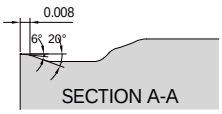
▶ Front two step dot

- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at high depth of cut

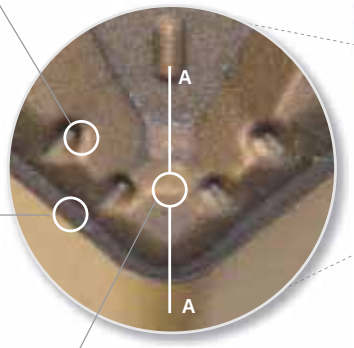
▶ Variable land

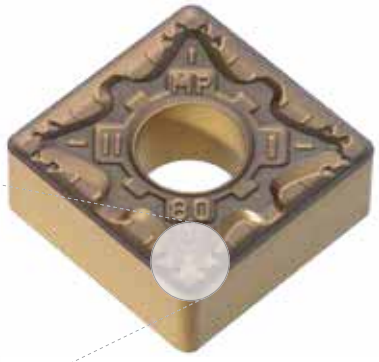
- Less crater wear
- Prevents chipping on minor cutting edge
- Higher toughness at high depth of cut and interrupted cutting

▶ Flat zone



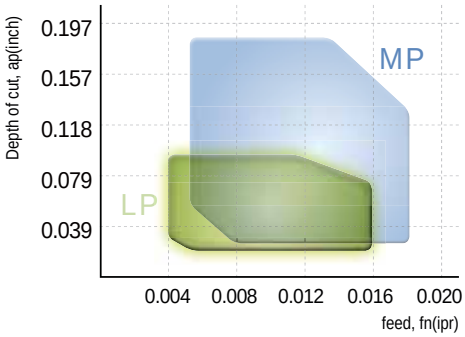
- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips





Application Range

(Medium to finish cutting)



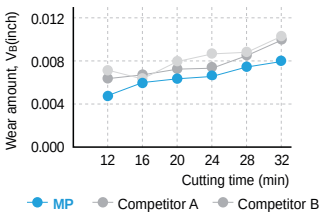
Wear resistance test

■ **Workpiece** 4140 (Alloy steel)
Ø3.937(inch)
External machining

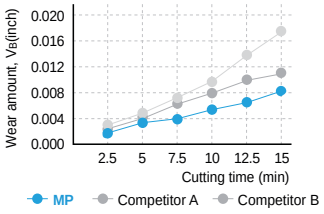
■ **Cutting conditions** vc(sfm) = 919
ap(inch) = 0.059
fn(ipr) = 0.010 / 0.016
wet

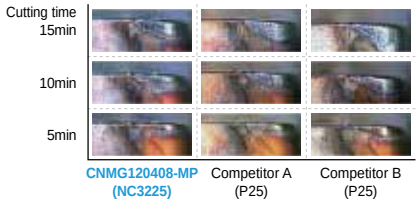
■ **Tool** CNMG432-□□

Medium feed (0.010ipr)



High feed (0.016ipr)

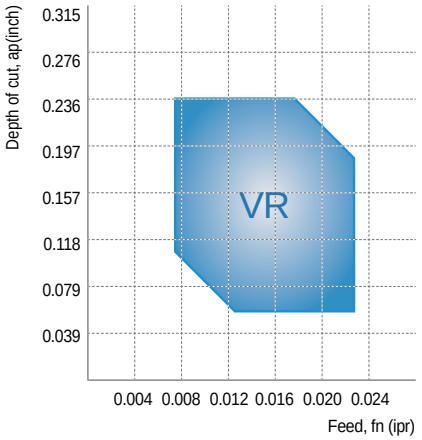




New Chip Breakers

VR Chip Breaker [For roughing]

- Increased stability when machining gray cast iron and ductile cast iron
- Increased productivity at high speed and high feed



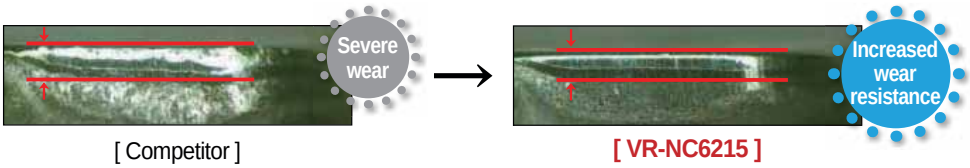
Features of VR chip breaker

- ▸ Wide land and pocket improve cutting performance at high feed
- ▸ Optimal cutting edge design for unstable and interrupted machining

Performance

■ Severe wear in continuous/interrupted machining of cast iron

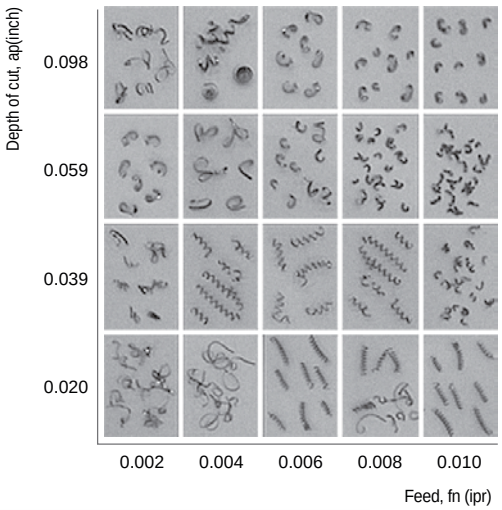
→ Longer tool life due to new VR chip breaker which is specially designed for high feed machining



[Competitor] [VR-NC6215]

MP Chip Breaker [For medium machining]

- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components



Features of MP chip breaker

- ▶ Three-dimensional 2 step chip breaker
  - Stable chip control in unstable internal machining
  - Prevents chip blocking at internal diameter at varying depth of cut and feed.
- ▶ Stronger cutting edge and wide chip pocket
  - Increased chipping resistance in unstable internal machining

Cutting performance

■ **Workpiece**	4140(Alloy steel)
■ **Cutting conditions**	vc=656(sfm), ap=0.020~0.098(inch) fn=0.002~0.010(ipr)
■ **Tool**	CCMT32.51-MP

New Chip Breakers

VH / VT Chip Breaker [Heavy duty machining]

- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large vertical machines when machining shafts, rollers, rotors and optimal for the big flange machining

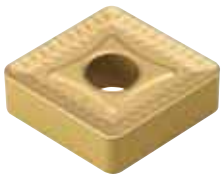
Special features of VH

• For good chip control in heavy machining (comprehensive type)

- ▶ Designed from the study of heavy cutting mechanism
- ▶ Smooth chip control from the high rake angle
- ▶ Wider cutting edge land provides stronger cutting
- ▶ Unique cutting edge treatment provides smooth cutting
- ▶ Optimized chip pocket design provides smooth chip flow

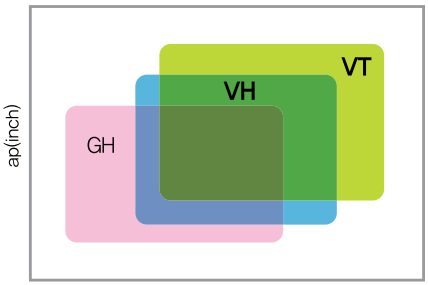
Special features of VT

• For long tool life and stable cutting (higher feeds, big depth) in heavy machining



- ▶ Designed from the study of heavy cutting mechanism
- ▶ Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- ▶ Varied cutting edge land strengthens the cutting edge
- ▶ The positioning of the chip breaking convex dot deflects the machining heat, optimizes inserts wear & absorb shock

Applications range of Chip breakers

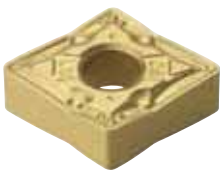


GH : ap=0.20~0.47inch fn=0.021~0.047ipr
VH : ap=0.24~0.59inch fn=0.027~0.055ipr
VT : ap=0.28~0.67inch fn=0.030~0.063ipr

LW / VW Chip Breaker [High feed cutting]

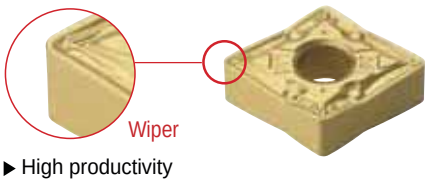
- Improved productivity with higher feed rates and surface finishes
- Improved wear resistance and toughness

Special features of LW



- ▶ **Curvilinear cutting edge**
  - Reduces cutting force
- ▶ **Cutting edge design able to handle deeper depth of cuts**
  - lower cutting load & reduces heat
- ▶ **Greater chip control at shallow depths of cuts**
  - Chip pocket design improves smooth chip flow
- ▶ **For shallow depth cutting and low speed machining**
  - 3D design at the corner

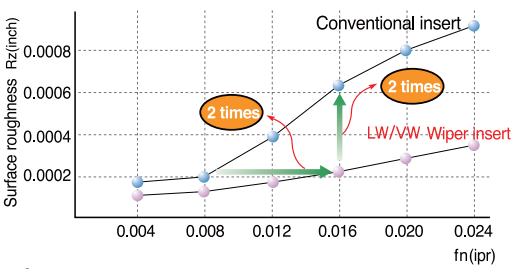
Wiper Insert



- ▶ High productivity
- ▶ Improved surface roughness
- ▶ High feed-reducing machining time
- ▶ Improved tool life due to reduce cutting force

Special features of VW

- ▶ **Excellent Finishing applications**
  - Excellent chip control
- ▶ **Insert design great for stable clmaping**
  - Chip breaker designed close to the cutting edge
- ▶ **Similar cutting edge to C/B for medium**
  - strong cutting edge
- ▶ **3 Dimensional dot design on cutting corner**
  - reduces cutting force and good chip control at shallow depth of cut



New Chip Breakers

VL Chip Breaker [Mild steel]

- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production

Special features of VL

- ▶ **2 steps designed chip-breaker** - Suitable Mild steel
  - Stable chip control on the low feed and cutting depth
- ▶ **Designed with special dots** - Stable chip breaking on the low cutting depth
- ▶ **Applied side rake angle** - Improved chip control on facing, copying applications
  - Decreased cutting load and better surface finish

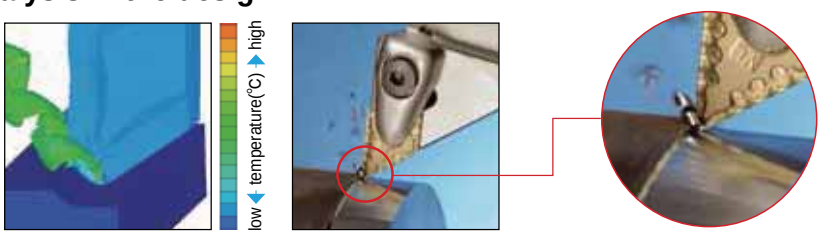
Chip control test

VL Chip Breakers | Competitor A | Competitor B | Competitor C

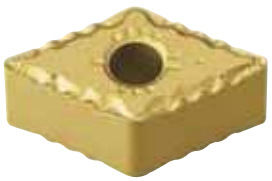
- **Workpiece** AISI1020
- **Cutting conditions** vc=830sfm, ap=0.02inch fn=0.008ipr(Side), wet
- **Designation** DNMG432-VL

FEM Cutting simulation analysis in the design

- ▶ For design of geometry, chip shapes and chip flow are predictable
- ▶ Optimal chip breaker design by various cutting conditions and workpieces



VB Chip Breaker [Copying]



- Excellent chip evacuation in continuous and high speed machining of various workpieces.
- Longer tool life due to 3 dimensional chip breaker realizing low cutting resistance and high rigidity of the cutting edge.
- Stable chip control in copying and internal machining.

Special features of VB

6 bumps on the insert corner

Superior chip control and chip cutting in copying with various depths of cut

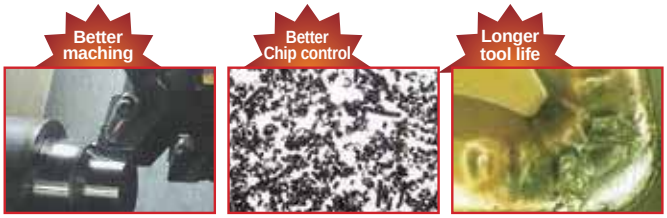
Side rake angle

Superb chip cutting in facing and copying
Superior tool life due to improved surface roughness and lower cutting resistance

Cutting edge on 100° part for medium machining (For CNMG)

Excellent chip evacuation and toughness in machining with high depth of cut

Performance



VB Chip Breakers

Conventional chip breaker

New Chip Breakers

VC Chip Breaker [Medium-finishing]

- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc.)
- Korloy 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength.
- Stable chip control in copying and internal machining

Features of VC chip breaker

4 bums on the insert corner

Excellent chip control in various depths of cut and superb chip cutting in external, internal, copy machining and facing.

Superior chip control in copy machining

VC Chip Breakers		Conventional chip breaker	
			

VP Chip Breaker

[For hard-to-cut materials machining]

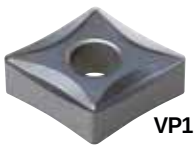
- High positive cutting edge reduces chip contact
- Minimized temperature while machining ensures longer tool life
- Stable machining with superior chip evacuation in high depths of cut

VP1(for finishing)

High positive cutting edge

▶ Longer tool life due to minimizing chip contact and reducing cutting heat while machining.

▶ Recommended cutting condition • fn=0.002~0.008ipr • ap=0.004~0.060inch



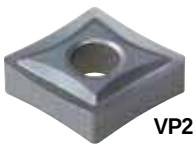
VP1

VP2(for medium to finishing)

High positive cutting edge and side rake angle

▶ Improved machining performance with stable chip control in ball machining with various depth of cuts.

▶ Recommended cutting condition • fn=0.004~0.016ipr • ap=0.020~0.177inch



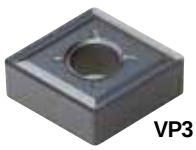
VP2

VP3(for medium machining)

High positive cutting edge and wide land

▶ Stable machinability in interrupted machining toughness.
Stable chip evacuation and machining in machining with high depth of cut.

▶ Recommended cutting condition • 0.004~0.018ipr • ap=0.020~0.200inch



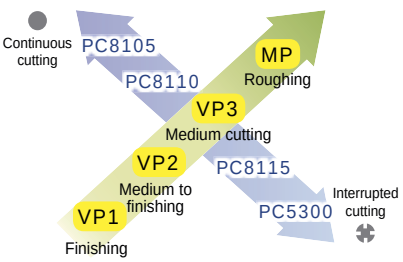
VP3

Machining of Hard-to-cut material

(Difficulty factors of Hard-to-cut material)

▶ Rapid wear on the cutting edge.
▶ Frequent fracture and chipping on the cutting edge.
▶ High cutting resistance.
▶ Rapidly rising temperature on the cutting edge.
▶ Increased built-up-edge due to bad chip control.

Negative



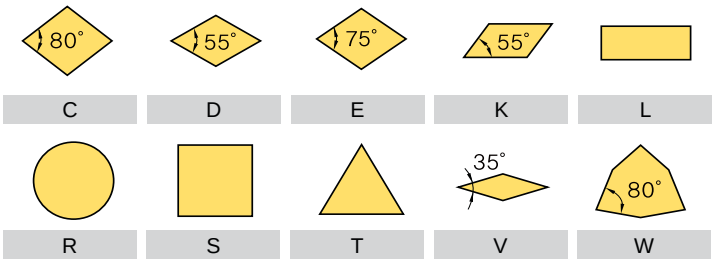
Chip breaker line-up for hard-to-cut materials

C N M G 3

1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed Circle

1 Insert Shape

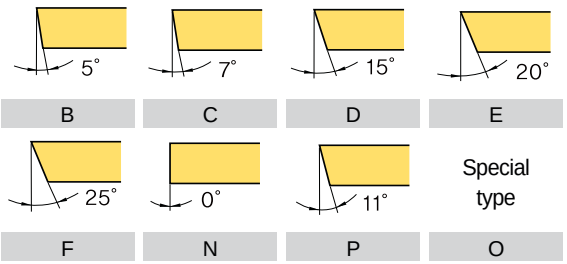
C N M G 3 3 2 - MP



C	D	E	K	L
R	S	T	V	W

2 Relief Angle

C N M G 3 3 2 - MP



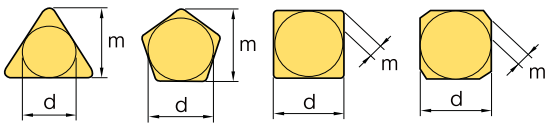
B	C	D	E
F	N	P	O

Special type

3 Tolerance

C N M G 3 3 2 - MP

d : Inscribed circle
t : Thickness
m : Refer to figure



(inch)

Class	d	m	t
A	±0.0010	±0.0002	±0.0010
C	±0.0010	±0.0005	±0.0010
H	±0.0005	±0.0005	±0.0010
E	±0.0010	±0.0010	±0.0010
G	±0.0010	±0.0010	±0.0005
J *	±0.002 ~ ±0.006	±0.0002	±0.0010
K *	±0.002 ~ ±0.006	±0.0005	±0.0010
L *	±0.002 ~ ±0.006	±0.0010	±0.0010
M *	±0.002 ~ ±0.006	±0.003 ~ ±0.008	±0.0005
N *	±0.002 ~ ±0.006	±0.003 ~ ±0.007	±0.0010
U *	±0.003 ~ ±0.010	±0.005 ~ ±0.015	±0.0005

* Sides are based on unground insert

Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (Exceptional case)

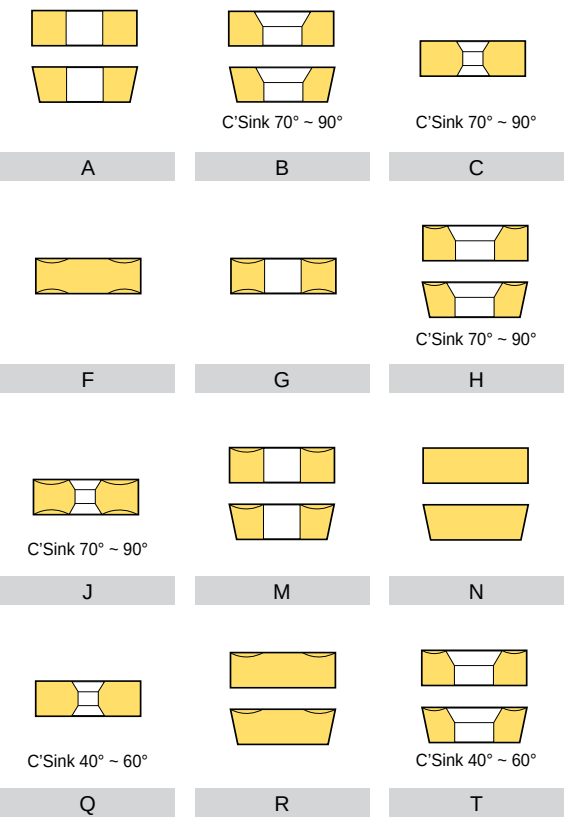
d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6.35	±0.002	±0.003	±0.003	±0.005
9.525	±0.002	±0.003	±0.003	±0.005
12.7	±0.003	±0.005	±0.005	±0.008
15.875	±0.004	±0.007	±0.06	±0.011
19.05	±0.004	±0.007	±0.06	±0.011
25.4	±0.005	±0.01	±0.07	±0.015

Tolerance on D Insert Shape (Exceptional case)

d	Tolerance on d	Tolerance on m
6.35	±0.002	±0.0043
9.525	±0.002	±0.0043
12.7	±0.003	±0.006
15.875	±0.004	±0.007
19.05	±0.004	±0.007

4 Cross Section Type

C N M G 3 3 2 - MP



A	B	C
F	G	H
J	M	N
Q	R	T
U	W	X

Special type

3 2 - MP

6 Height of Cutting Edge | 7 Nose Radius (Nose R) | 8 Chip Breaker for Turning

5 Cutting Edge Length, Diameter of Inscribed Circle

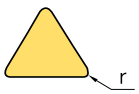
C N M G **3** 3 2 - MP

Symbol							Inch	IC
C	d	S	T	R	V	W		
Metric								d(inch)
03	04	03	06	03	-	02	1.2(5)	5/32
04	05	04	08	04	08	S3	1.5(6)	3/16
05	06	05	09	05	09	03	1.8(7)	7/32
-	-	-	-	06	-	-	-	0.236
06	07	06	11	06	11	04	2	1/4
08	09	07	13	07	13	05	2.5	5/16
-	-	-	-	08	-	-	-	0.315
09	11	09	16	09	16	06	3	3/8
-	-	-	-	10	-	-	-	0.394
11	13	11	19	11	19	07	3.5	7/16
-	-	-	-	12	-	-	-	0.472
12	15	12	22	12	22	08	4	1/2
14	17	14	24	14	24	09	4.5	9/16
16	19	15	27	15	27	10	5	5/8
-	-	-	-	16	-	-	-	0.630
17	21	17	30	17	30	11	5.5	11/16
19	23	19	33	19	33	13	6	3/4
-	-	-	-	20	-	-	-	0.787
22	27	22	38	22	38	15	7	7/8
-	-	-	-	25	-	-	-	0.984
25	31	25	44	25	44	17	8	1
32	38	31	54	31	54	21	10	11/4
-	-	-	-	32	-	-	-	1.260

( ) Symbol for small size insert

7 Nose Radius (Nose R)

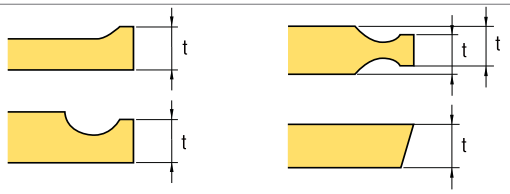
C N M G 3 3 **2** - MP



Symbol		Corner Radius	
Metric	Inch	Metric	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/64
32	8	3.2	1/8
00	-	Round insert(Inch)	
M0	-	Round insert(Metric)	

6 Height of Cutting Edge

C N M G 3 **3** 2 - MP



Symbol		Height of Cutting Edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

( ) Symbol for small size insert

8 Chip Breaker for Turning

C N M G 3 3 2 - **MP**

Negative Insert Chip Breaker

VL VF VB VC VQ VW

VM VR VH VT VK VP1

VP2 VP3 HA HS HR GS

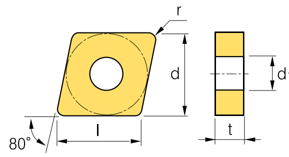
GR GH B25 LP MP

Positive Insert Chip Breaker

VF HMP C25 MP AK AR

CN○○

Rhombic 80° Negative

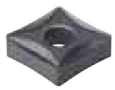
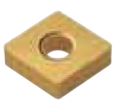
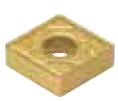
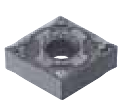


Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P	●	◉	✱	●	◉	●	●	◉	◉	◉	✱	✱												
Stainless steel	M											◉	◉	●	◉				◉	✱		●	◉		
Cast iron	K	●	◉	✱	●	◉							◉			●	◉	◉						●	◉
Non-ferrous metal	N																							●	◉
Heat resistant alloy, Titanium alloy	S												◉						◉	✱	●	●	◉	●	◉
Hardened steel	H																					◉	✱	●	◉

Machining types

● Continuous cutting
◉ General cutting
✱ Interrupted cutting

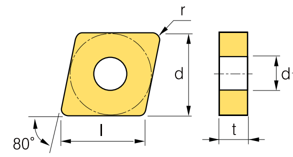
	Inserts	Designation		Cermet			Coated		Coated																	Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Finishing	VP1 	CNGG	430.5-VP1																									0.004~0.039	0.000~0.004
			431-VP1																									0.004~0.059	0.002~0.006
			432-VP1																									0.004~0.059	0.003~0.008
Roughing		CNMA	322																									0.004~0.012	0.020~0.118
			431																●	●						●		0.006~0.024	0.008~0.197
			432																●	●						●		0.006~0.025	0.008~0.315
			433															●	●	●								0.006~0.028	0.012~0.315
			434																●	●								0.008~0.039	0.012~0.394
			542																●	●								0.006~0.031	0.012~0.394
			543																●	●								0.006~0.031	0.012~0.394
			544																	●								0.008~0.039	0.012~0.394
			642																●	●								0.006~0.024	0.008~0.472
			643																●	●								0.008~0.031	0.008~0.472
			644																●	●								0.008~0.039	0.008~0.472
Finishing	VB 	CNMG	431-VB	●		●	●	●	●	●		●	●		●									●				0.006~0.024	0.040~0.200
			432-VB	●		●	●	●	●	●		●	●		●									●				0.008~0.028	0.040~0.240
			433-VB							●			●		●													0.008~0.020	0.040~0.240
Finishing	VF 	CNMG	321-VF						●		●	●	●															0.003~0.012	0.020~0.059
			322-VF																									0.005~0.006	0.020~0.059
			431-VF						●		●	●			●													0.003~0.012	0.020~0.059
			432-VF						●			●			●													0.004~0.016	0.020~0.059
			433-VF																									0.004~0.020	0.024~0.059
Finishing (Cermet)	VG 	CNMG	321-VG																									0.003~0.012	0.020~0.059
			322-VG																									0.003~0.012	0.020~0.059
			431-VG	●	●																							0.003~0.012	0.020~0.059
			432-VG	●																								0.004~0.016	0.020~0.059
Finishing (Mild steel)	VL 	CNMG	431-VL	●		●			●						●													0.002~0.010	0.004~0.040
			432-VL	●		●			●			●	●		●													0.004~0.014	0.008~0.060
			433-VL							●																		0.004~0.014	0.008~0.060

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	**MCRNR/L**	B117
MCLNR/L	B116	**PCBNR/L**	B104
MCMNN	B116	**PCLNR/L**	B105

CN○○

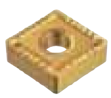
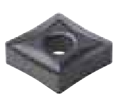
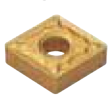


Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
64	3/4	1/4	5/16

Rhombic **80° Negative**

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Machining types
- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

	Inserts	Designation	Cermet			Coated		Coated																	Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (wiper)	VW 	CNMG **431-VW**																									0.004~0.012	0.020~0.118
		432-VW						●																			0.006~0.020	0.020~0.157
Medium to finishing	HA 	CNMG **431-HA**													●	●			●			●		●	●		0.002~0.008	0.031~0.138
		432-HA													●	●			●			●		●	●		0.004~0.016	0.031~0.138
		433-HA																						●			0.005~0.022	0.031~0.138
Medium to finishing	HC 	CNMG **431-HC**						●					●	●													0.002~0.012	0.031~0.138
		432-HC						●		●			●	●													0.003~0.016	0.031~0.157
		433-HC																									0.007~0.020	0.039~0.157
Medium to finishing	LP 	CNMG **431-LP**							●			●		●													0.004~0.014	0.012~0.079
		432-LP							●			●		●													0.004~0.016	0.020~0.098
		433-LP							●			●		●													0.005~0.028	0.031~0.118
Medium to finishing	VC 	CNMG **431-VC**						●	●		●	●		●								●					0.004~0.014	0.012~0.079
		432-VC							●		●	●		●								●					0.006~0.016	0.020~0.118
		433-VC							●		●	●															0.008~0.018	0.020~0.118
Medium to finishing	VP2 	CNMG **431-VP2**																	●	●	●	●	●				0.002~0.012	0.004~0.118
		432-VP2									●								●	●	●	●	●				0.004~0.016	0.020~0.177
Medium to finishing	VQ 	CNMG **332-VQ**						●						●													0.002~0.012	0.002~0.138
		333-VQ						●						●													0.003~0.012	0.003~0.157
		431-VQ	●	●	●	●	●					●															0.002~0.012	0.031~0.157
		432-VQ	●	●	●	●						●															0.003~0.016	0.031~0.157
		433-VQ							●			●															0.004~0.016	0.039~0.157
Medium	GM 	CNMG **431-GM**			●								●														0.002~0.012	0.035~0.197
		432-GM	●	●	●					●	●		●	●													0.004~0.020	0.039~0.197
		433-GM																									0.007~0.024	0.012~0.197
		642-GM																									0.004~0.020	0.039~0.315

Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	**MCRNR/L**	B117
MCLNR/L	B116	**PCBNR/L**	B104
MCMNN	B116	**PCLNR/L**	B105

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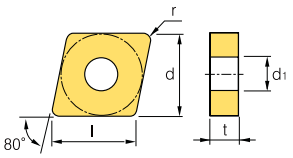
Rhombic 80° Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ⧓ ✱ ⧓ ⧓ ● ⧓ ⧓ ✱ ● ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ● ⧓ ⧓
Hardened steel	H	✱ ✱ ● ⧓

⧓ General cutting
✱ Interrupted cutting

Inserts		Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	HS	CNMG 321-HS																					●			0.002~0.008	0.039~0.098
		322-HS																					●			0.004~0.008	0.039~0.098
		431-HS													●	●			●			●	●			0.002~0.008	0.039~0.177
		432-HS													●	●			●	●		●	●			0.004~0.020	0.039~0.177
		433-HS														●			●	●		●	●			0.005~0.022	0.039~0.177
		543-HS																					●			0.005~0.022	0.079~0.236
		544-HS																					●			0.006~0.024	0.079~0.236
		643-HS																	●	●		●	●			0.005~0.022	0.079~0.287
		644-HS														●						●	●			0.006~0.024	0.079~0.287
Medium	MP	CNMG 321-MP																									0.004~0.016	0.016~0.150
		322-MP																									0.006~0.016	0.020~0.157
		323-MP																									0.006~0.020	0.032~0.165
		331-MP																									0.004~0.016	0.016~0.150
		332-MP																									0.006~0.016	0.020~0.157
		333-MP																									0.006~0.020	0.032~0.165
		431-MP							●		●		●					●			●	●	●			0.004~0.016	0.016~0.150
		432-MP							●		●		●					●			●	●	●			0.006~0.016	0.020~0.157
		433-MP							●		●		●					●			●	●				0.006~0.020	0.032~0.165
Medium	VM	CNMG 321-VM									●																0.002~0.012	0.036~0.138
		322-VM								●	●		●														0.004~0.018	0.039~0.138
		431-VM	●	●	●			●		●	●		●	●			●		●	●				●			0.002~0.012	0.036~0.197
		432-VM	●	●	●			●		●	●		●	●			●		●	●		●		●			0.004~0.020	0.039~0.197
		433-VM						●		●	●		●	●			●		●	●		●					0.005~0.024	0.051~0.197
		434-VM												●													0.008~0.024	0.059~0.217
		542-VM									●		●	●													0.004~0.020	0.039~0.264
		543-VM											●														0.005~0.024	0.051~0.264
		643-VM											●	●													0.006~0.028	0.059~0.276
Medium	VP3	CNMG 431-VP3																	●	●	●	●	●				0.002~0.012	0.004~0.118
		432-VP3																	●	●	●	●	●				0.004~0.016	0.020~0.177
		433-VP3																	●	●	●	●	●			●	0.005~0.020	0.020~0.197
Medium (wiper)	LW	CNMG 432-LW												●													0.006~0.024	0.040~0.200
		433-LW																									0.008~0.028	0.040~0.240

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	MCRNR/L	B117
MCLNR/L	B116	PCBNR/L	B104
MCMNN	B116	PCLNR/L	B105

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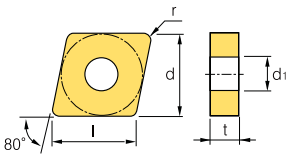
Rhombic 80° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC500H	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	PC9030	NC6205	NC6210	NC6215	PC5300	PC5400	PC8110	H01	H05	fn (ipr)	ap (inch)
Medium to roughing	B25	CNMG	431-B25	●	●	●				●	●		●	●	●	●					●	●	●					0.007~0.018	0.039~0.197
			432-B25	●	●	●			●	●	●	●	●	●	●	●			●	●	●	●	●	●	●			0.009~0.024	0.059~0.197
			433-B25			●				●	●		●	●	●	●					●	●						0.010~0.024	0.079~0.197
			542-B25								●			●	●	●												0.010~0.024	0.079~0.256
			543-B25								●			●		●						●						0.011~0.024	0.079~0.256
			544-B25								●			●		●						●						0.011~0.024	0.079~0.256
			641-B25												●	●												0.008~0.018	0.118~0.315
			642-B25								●	●		●	●	●					●	●						0.010~0.024	0.118~0.315
			643-B25							●	●	●		●	●	●					●	●	●	●	●			0.012~0.024	0.118~0.315
			644-B25								●			●	●							●						0.009~0.028	0.118~0.315
Medium to roughing	GS	CNMG	431-GS														●	●	●			●		●				0.002~0.010	0.004~0.118
			432-GS												●		●	●	●			●		●				0.004~0.020	0.039~0.197
			433-GS														●	●	●			●		●				0.005~0.026	0.039~0.197
			542-GS																									0.004~0.020	0.039~0.256
			543-GS																									0.005~0.026	0.039~0.256
			643-GS															●						●				0.005~0.026	0.039~0.307
			644-GS																					●				0.005~0.026	0.039~0.307
Roughing	GR	CNMG	432-GR							●		●	●		●	●				●	●	●						0.008~0.020	0.039~0.276
			433-GR							●		●	●		●	●					●	●						0.010~0.020	0.051~0.276
			434-GR																		●							0.010~0.024	0.071~0.236
			542-GR										●		●						●	●						0.008~0.028	0.039~0.315
			543-GR							●		●	●		●	●					●	●						0.010~0.028	0.051~0.315
			544-GR										●		●							●						0.010~0.030	0.071~0.315
			642-GR									●			●	●					●	●						0.008~0.028	0.067~0.394
			643-GR							●	●	●			●	●					●	●						0.012~0.030	0.067~0.394
			644-GR							●	●	●			●	●						●						0.012~0.031	0.071~0.394
			646-GR																									0.014~0.033	0.079~0.472
			856-GR																									0.016~0.039	0.091~0.591
			866-GR												●	●												0.016~0.039	0.091~0.591
Roughing	VK	CNMG	432-VK																	●	●							0.008~0.020	0.039~0.197
			433-VK																	●	●							0.010~0.020	0.051~0.236
			434-VK																		●							0.010~0.024	0.071~0.276

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	MCRNR/L	B114
MCLNR/L	B116	PCBNR/L	B107
MCMNN	B116	PCLNR/L	B105

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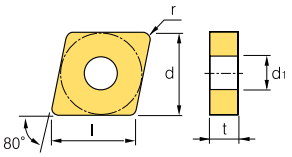
Rhombic 80° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
86	1	3/8	23/64

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ● ⧓ ✱ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ⧓ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing	CNMG 431-HR																								0.006~0.012	0.031~0.236
	432-HR						●					●	●												0.008~0.020	0.039~0.276
	433-HR						●					●													0.010~0.028	0.051~0.276
	434-HR																								0.013~0.030	0.071~0.276
	542-HR																								0.008~0.020	0.039~0.315
	543-HR																								0.010~0.028	0.051~0.315
	544-HR																								0.012~0.031	0.071~0.315
	546-HR																								0.013~0.035	0.091~0.394
	642-HR																								0.008~0.020	0.067~0.394
	643-HR																●								0.010~0.028	0.051~0.394
	644-HR								●			●													0.012~0.031	0.071~0.394
	646-HR																								0.013~0.035	0.091~0.394
	866-HR																								0.016~0.039	0.091~0.394
Roughing	CNMG 432-VR																	●							0.010~0.022	0.047~0.276
	433-VR																	●							0.012~0.024	0.059~0.276
	434-VR																	●							0.014~0.026	0.067~0.276
	543-VR																	●							0.014~0.028	0.078~0.315
	643-VR							●			●							●							0.014~0.028	0.078~0.394
	644-VR							●			●							●							0.014~0.030	0.087~0.394
Medium to finishing	CNMM 432-HA																								0.004~0.016	0.031~0.138
Medium	CNMM 432-GM																								0.004~0.020	0.039~0.197
Roughing	CNMM 432-GR																								0.008~0.020	0.039~0.276
	433-GR																								0.010~0.020	0.051~0.276
	643-GR											●													0.012~0.030	0.067~0.394
	644-GR																								0.012~0.031	0.071~0.394

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	MCRNR/L	B117
MCLNR/L	B116	PCBNR/L	B104
MCMNN	B116	PCLNR/L	B105

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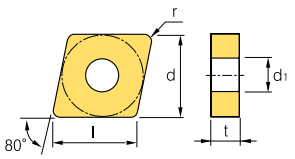
Rhombic 80° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
54	5/8	3/16~1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece																										
Steel	P	●	⬌	✱	●	⬌	●	●	⬌	⬌	⬌	✱	✱													
Stainless steel	M											⬌	⬌	●	⬌				⬌	✱		●	⬌			
Cast iron	K	●	⬌	✱	●	⬌							⬌			●	⬌	⬌						●	⬌	
Non-ferrous metal	N																							●	⬌	
Heat resistant alloy, Titanium alloy	S												⬌						⬌	✱	●	●	⬌	●	⬌	
Hardened steel	H																					⬌	✱	●	⬌	

Machining types

● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC500H	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Heavy	GH	CNMM 432-GH										●			● ●											0.012~0.024	0.098~0.315
		433-GH									● ●			●													0.012~0.028	0.098~0.315
		533-GH																									0.012~0.028	0.098~0.315
		536-GH																									0.012~0.047	0.098~0.315
		543-GH												●													0.012~0.035	0.098~0.315
		544-GH																									0.012~0.047	0.098~0.315
		546-GH																									0.012~0.059	0.098~0.315
		642-GH													●												0.012~0.024	0.098~0.315
		643-GH						●	●	●	●			●	●												0.012~0.028	0.118~0.315
		644-GH						●	●	●	●			●	●												0.018~0.035	0.118~0.315
		646-GH							●	●	●				●												0.022~0.047	0.157~0.354
		854-GH																									0.020~0.039	0.177~0.394
		856-GH								●	●																0.022~0.047	0.197~0.472
		866-GH						●	●	●	●			●	●												0.022~0.047	0.197~0.472
		8612.5-GH																									0.026~0.051	0.236~0.472
Heavy (General)	VH	CNMM 643-VH								●																	0.020~0.036	0.200~0.400
		644-VH								●																	0.020~0.044	0.200~0.400
		646-VH						●		●																	0.024~0.048	0.240~0.480
		856-VH								●																	0.028~0.056	0.240~0.600
		866-VH								●																	0.028~0.056	0.240~0.600
Heavy (High feed cutting)	VT	CNMM 643-VT								●					● ●												0.024~0.040	0.240~0.520
		644-VT						●		●																	0.024~0.044	0.200~0.400
		646-VT								●																	0.024~0.064	0.280~0.520
		856-VT								●																	0.030~0.064	0.280~0.680
		866-VT								●																	0.030~0.064	0.280~0.680

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B116	MCRNR/L	B117
MCLNR/L	B116	PCBNR/L	B104
MCMNN	B116	PCLNR/L	B105

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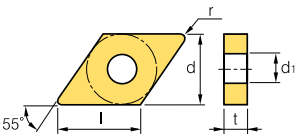
Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64
54	5/8	1/4	5/16

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

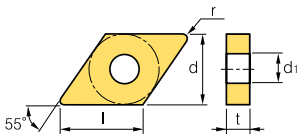
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Finishing	VP1	DNGG	431-VP1																								0.002~0.006	0.004~0.059
			432-VP1																								0.003~0.008	0.004~0.059
			441-VP1																								0.002~0.006	0.004~0.059
			442-VP1																								0.003~0.008	0.004~0.059
Roughing		DNMA	332																								0.007~0.018	0.031~0.118
			431																	●							0.007~0.022	0.016~0.157
			432																●	●							0.010~0.022	0.031~0.157
			433																●	●							0.010~0.026	0.059~0.157
			441																								0.007~0.022	0.016~0.157
			442																●	●							0.010~0.022	0.031~0.157
			443																●	●							0.010~0.026	0.047~0.157
			542																								0.012~0.031	0.098~0.512
Finishing	VB	DNMG	431-VB	●		●	●	●	●				●											●				0.004~0.014	0.012~0.078
			432-VB	●		●	●	●		●			●	●										●				0.006~0.018	0.020~0.078
			433-VB							●			●	●														0.006~0.018	0.020~0.078
			441-VB	●		●	●	●	●	●			●	●														0.004~0.014	0.012~0.078
			442-VB	●		●	●	●		●		●	●	●							●							0.006~0.018	0.020~0.078
			443-VB							●			●	●														0.008~0.020	0.020~0.098
Finishing	VF	DNMG	330.5-VF																								0.002~0.008	0.008~0.039
			331-VF									●			●												0.003~0.012	0.020~0.059
			332-VF																								0.004~0.016	0.020~0.059
			431-VF						●										●					●			0.003~0.012	0.020~0.059
			432-VF																								0.004~0.016	0.020~0.059
			433-VF																								0.006~0.020	0.024~0.059
			441-VF						●		●	●			●												0.005~0.012	0.020~0.059
			442-VF						●		●				●												0.004~0.016	0.020~0.059
			443-VF																								0.006~0.020	0.024~0.059
Finishing (Cermet)	VG	DNMG	331-VG																								0.003~0.012	0.020~0.059
			332-VG																								0.004~0.016	0.020~0.059
			431-VG																								0.003~0.012	0.020~0.059
			432-VG																								0.004~0.016	0.020~0.059
			441-VG	●	●																						0.005~0.012	0.020~0.059
			442-VG	●																							0.004~0.016	0.020~0.059

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	PDJNR/L	B106, 160
MDNNN	B117	PDNNR/L	B106
MDQNR/L	B118	PDSNR/L	B138
MDUNR/L	B142	PDUNR/L	B139

DN○○

Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05
Steel	P		●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱												
Stainless steel	M												⧓	⧓	●	⧓				⧓	✱		●	⧓		
Cast iron	K		●	⧓	✱	●	⧓							⧓			●	⧓	⧓						●	⧓
Non-ferrous metal	N																								●	⧓
Heat resistant alloy, Titanium alloy	S													⧓						⧓	✱	●	●		●	⧓
Hardened steel	H																						⧓		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (Mild steel)	VL	DNMG	332-VL																								0.002~0.008	0.004~0.040
			431-VL						●				●		●												0.002~0.010	0.004~0.060
			432-VL										●		●												0.002~0.012	0.008~0.060
			433-VL																								0.004~0.012	0.010~0.060
			441-VL	●					●																		0.002~0.010	0.004~0.060
			442-VL	●					●			●			●												0.002~0.012	0.008~0.060
			443-VL																								0.004~0.012	0.010~0.060
Finishing (wiper)	VW	DNMG	431-VW																								0.004~0.014	0.012~0.118
			432-VW																								0.004~0.016	0.012~0.118
			441-VW																								0.004~0.014	0.012~0.118
			442-VW						●					●													0.004~0.016	0.012~0.118
Medium to finishing	HA	DNMG	431-HA																				●	●	●		0.002~0.012	0.031~0.138
			432-HA																		●		●	●	●		0.004~0.016	0.031~0.138
			441-HA								●						●						●	●	●		0.002~0.012	0.031~0.138
			442-HA																				●	●	●		0.004~0.016	0.031~0.138
Medium to finishing	HC	DNMG	431-HC																								0.007~0.008	0.002~0.138
			432-HC																								0.007~0.008	0.031~0.157
			433-HC																								0.005~0.020	0.035~0.157
			441-HC																								0.002~0.012	0.031~0.157
			442-HC																								0.003~0.016	0.031~0.157
			443-HC																								0.005~0.020	0.035~0.157
Medium to finishing	LP	DNMG	431-LP							●			●	●													0.004~0.014	0.012~0.078
			432-LP							●			●	●													0.004~0.016	0.020~0.098
			433-LP							●			●	●													0.005~0.018	0.032~0.118
			441-LP							●			●	●													0.004~0.014	0.012~0.078
			442-LP							●			●	●													0.004~0.016	0.020~0.098
			443-LP										●	●													0.005~0.018	0.032~0.118

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	**PDJNR/L**	B106, 160
MDNNN	B117	**PDNNR/L**	B106
MDQNR/L	B118	**PDSNR/L**	B138
MDUNR/L	B142	**PDUNR/L**	B139

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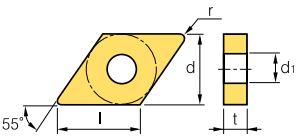
Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	1/8~7/32	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ⧓ ● ● ⧓ ⧓ ● ⧓ ⧓ ✱ ⧓ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓ ● ⧓ ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ● ⧓ ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	VC	DNMG	431-VC						●			●												●			0.004~0.014	0.012~0.079
			432-VC							●		●	●		●												0.006~0.016	0.020~0.118
			433-VC																								0.006~0.018	0.020~0.118
			441-VC						●	●		●	●											●			0.004~0.014	0.012~0.079
			442-VC						●	●		●	●		●												0.006~0.016	0.020~0.118
			443-VC																								0.006~0.018	0.020~0.118
Medium to finishing	VP2	DNMG	431-VP2																		●	●	●	●	●			0.002~0.012	0.004~0.118
			432-VP2																		●	●	●	●	●			0.004~0.016	0.020~0.177
			441-VP2																		●	●	●	●	●			0.002~0.012	0.004~0.118
			442-VP2									●									●	●	●	●	●	●		0.004~0.016	0.020~0.177
Medium to finishing (Cermet)	VQ	DNMG	331-VQ	●																								0.002~0.012	0.020~0.138
			33.52-VQ						●						●													0.003~0.016	0.031~0.157
			431-VQ	●	●	●	●	●																				0.002~0.012	0.031~0.138
			432-VQ	●	●	●	●	●					●															0.003~0.016	0.031~0.157
			441-VQ	●	●	●	●	●					●															0.002~0.012	0.031~0.157
			442-VQ	●	●	●	●	●					●															0.003~0.016	0.031~0.157
Medium	GM	DNMG	431-GM																									0.002~0.012	0.036~0.197
			432-GM	●		●																						0.004~0.020	0.039~0.197
			433-GM																									0.005~0.024	0.051~0.197
			441-GM		●	●								●														0.002~0.012	0.036~0.197
			442-GM						●		●			●														0.004~0.020	0.039~0.197
			443-GM											●														0.005~0.024	0.051~0.197
Medium	MP	DNMG	331-MP																									0.004~0.016	0.016~0.150
			332-MP																									0.006~0.016	0.020~0.157
			333-MP																									0.006~0.020	0.032~0.165
			33.51-MP																									0.004~0.016	0.016~0.150
			33.52-MP																									0.006~0.016	0.020~0.157
			33.53-MP																									0.006~0.020	0.032~0.165
			431-MP							●			●		●					●				●			0.004~0.016	0.016~0.157
			432-MP							●			●		●					●			●	●			0.006~0.018	0.020~0.177
			433-MP							●			●		●					●			●	●			0.006~0.020	0.032~0.197
			441-MP							●			●		●					●				●			0.004~0.016	0.016~0.157
			442-MP							●			●		●					●				●			0.006~0.018	0.020~0.177
			443-MP							●			●		●					●			●	●			0.006~0.020	0.032~0.197

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	PDJNR/L	B106, 160
MDNNN	B117	PDNNR/L	B106
MDQNR/L	B118	PDSNR/L	B138
MDUNR/L	B142	PDUNR/L	B139

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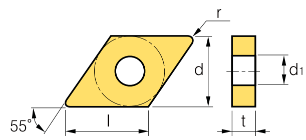
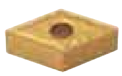
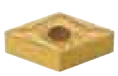
Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	1/8~7/32	5/32
43	1/2	3/16	13/64
44	1/2	1/2	13/64

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	◐	✱	●	◐	●	●	◐	◐	◐	✱	✱												
	Stainless steel	M											◐	◐	●	◐			◐	✱		●	◐	◐		
	Cast iron	K	●	◐	✱	●	◐							◐			◐	◐							●	◐
	Non-ferrous metal	N																							●	◐
	Heat resistant alloy, Titanium alloy	S												◐					◐	✱	●	●	◐		●	◐
	Hardened steel	H																				◐			●	◐

Machining types
- ● Continuous cutting
- ◐ General cutting
- ✱ Interrupted cutting

Inserts	Designation	Cermet			Coated		Coated																	Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium HS 	DNMG 331-HS														●								●			0.002~0.014	0.031~0.098
	332-HS														●								●			0.004~0.016	0.039~0.098
	431-HS																	●			●		●			0.002~0.014	0.031~0.157
	432-HS																	●	●		●		●			0.004~0.016	0.039~0.157
	433-HS																									0.005~0.022	0.039~0.177
	441-HS														●			●			●		●			0.002~0.014	0.031~0.157
	442-HS														●			●	●		●		●			0.004~0.016	0.039~0.177
	443-HS														●								●			0.004~0.022	0.039~0.177
Medium VM 	DNMG 331-VM									●																0.002~0.012	0.035~0.157
	332-VM						●		●	●			●													0.004~0.020	0.039~0.157
	333-VM																									0.005~0.020	0.051~0.157
	431-VM	●								●			●			●		●	●							0.002~0.012	0.035~0.197
	432-VM	●		●			●			●		●	●			●		●	●							0.004~0.020	0.039~0.197
	433-VM											●	●					●	●							0.005~0.024	0.051~0.197
	441-VM	●	●	●					●	●		●	●			●		●	●				●			0.002~0.012	0.035~0.197
	442-VM	●					●		●	●		●	●			●		●	●				●			0.004~0.020	0.039~0.197
	443-VM									●		●	●					●	●							0.005~0.024	0.051~0.197
Medium VP3 	DNMG 431-VP3																	●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
	432-VP3																	●	●	●	●	●				0.004~0.018	0.020~0.197
	433-VP3																	●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
	441-VP3																	●	●		●	●			●	0.002~0.012	0.004~0.118
	442-VP3																	●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
	443-VP3																	●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
Medium (wiper) LW 	DNMG 432-LW																									0.006~0.020	0.028~0.177
	433-LW																									0.008~0.024	0.039~0.197
	442-LW						●																			0.006~0.020	0.028~0.177
	443-LW																									0.008~0.024	0.039~0.197

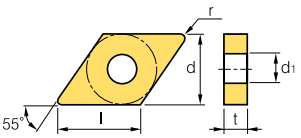
Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	**PDJNR/L**	B106, 160
MDNNN	B117	**PDNNR/L**	B106
MDQNR/L	B118	**PDSNR/L**	B138
MDUNR/L	B142	**PDUNR/L**	B139

DN○○

Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ✱ ● ● ⧓ ✱ ⧓ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ✱ ● ● ⧓ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to roughing	B25	DNMG	430.5-B25																								0.006~0.016	0.020~0.138
			431-B25		●					●			●	●	●					●							0.007~0.018	0.039~0.157
			432-B25		●					●			●	●	●				●	●							0.007~0.022	0.059~0.157
			433-B25							●			●		●					●							0.010~0.022	0.059~0.157
			436.5-B25																								0.014~0.026	0.098~0.217
			440.5-B25																								0.006~0.016	0.020~0.138
			441-B25	●						●		●	●	●	●				●	●							0.007~0.022	0.059~0.157
			442-B25	●					●	●		●	●	●	●				●	●				●	●			0.007~0.022	0.059~0.157
			443-B25							●			●		●				●	●								0.010~0.022	0.059~0.157
			446.5-B25																								0.014~0.026	0.098~0.217
Medium to roughing	GS	DNMG	431-GS																								0.003~0.016	0.039~0.197
			432-GS																		●						0.004~0.020	0.039~0.197
			433-GS																								0.002~0.026	0.039~0.197
			441-GS																					●	●		0.003~0.016	0.039~0.197
			442-GS																		●			●	●		0.004~0.020	0.039~0.197
			443-GS														●										0.004~0.026	0.039~0.197
Roughing	GR	DNMG	432-GR											●					●	●								0.008~0.020	0.039~0.276
			433-GR																●	●								0.010~0.035	0.051~0.276
			434-GR																									0.012~0.030	0.071~0.276
			442-GR									●		●	●				●	●								0.008~0.020	0.039~0.276
			443-GR									●		●					●	●								0.010~0.028	0.051~0.276
			444-GR												●													0.008~0.030	0.071~0.276
Roughing	VK	DNMG	431-VK																●									0.006~0.020	0.031~0.236
			432-VK																●									0.008~0.020	0.039~0.276
			433-VK															●	●									0.010~0.028	0.051~0.276
			441-VK																									0.008~0.020	0.039~0.276
			442-VK																●									0.008~0.020	0.039~0.276
			443-VK															●	●									0.010~0.028	0.051~0.276

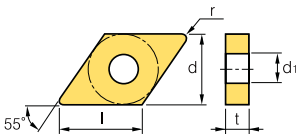
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	**PDJNR/L**	B106, 160
MDNNN	B117	**PDNNR/L**	B106
MDQNR/L	B118	**PDSNR/L**	B138
MDUNR/L	B142	**PDUNR/L**	B139

DN○○

Rhombic 55° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
44	1/2	1/4	13/64
54	5/8	1/4	5/16

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱	● Continuous cutting
Stainless steel	M	⬌ ✱ ⬌ ⬌ ✱ ✱ ● ⬌ ✱ ✱ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ✱ ● ● ⬌ ⬌ ✱ ● ⬌	
Hardened steel	H	⬌ ✱ ● ⬌	

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing	HR	DNMG	432-HR																								0.008~0.020	0.039~0.276
			433-HR																								0.010~0.028	0.051~0.276
			434-HR																								0.012~0.030	0.071~0.276
			442-HR						●																		0.008~0.020	0.039~0.276
			443-HR						●																		0.010~0.028	0.051~0.276
			444-HR																								0.008~0.030	0.071~0.276
			543-HR																								0.008~0.030	0.071~0.315
Roughing	VR	DNMG	432-VR																	●							0.010~0.022	0.047~0.276
			433-VR																	●							0.012~0.024	0.059~0.276
			442-VR																	●							0.010~0.022	0.047~0.276
			443-VR																	●							0.012~0.024	0.059~0.276
Medium (Shaft)	SH	DNMX	431R-SH																								0.006~0.012	0.039~0.157
			432R-SH																								0.006~0.020	0.059~0.197
			441R-SH																								0.006~0.012	0.039~0.157
			442R-SH																								0.006~0.020	0.059~0.197
			431L-SH																								0.006~0.012	0.039~0.157
			432L-SH																								0.006~0.020	0.059~0.197
			441L-SH																								0.006~0.012	0.039~0.157
			442L-SH																								0.006~0.020	0.059~0.197

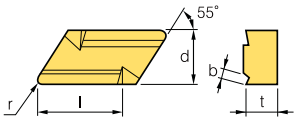
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B117	PDJNR/L	B106, 160
MDNNN	B117	PDNNR/L	B106
MDQNR/L	B118	PDSNR/L	B138
MDUNR/L	B142	PDUNR/L	B139

KN○○

Parallelogram 55° Negative



Dimensions(inch)		
Size	d	t
16	3/8	3/16

Workpiece		
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱ ⧓ ⧓ ⧓ ✱ ✱ ● ⧓
Stainless steel	M	⧓ ⧓ ● ⧓ ⧓ ✱ ✱ ● ● ⧓ ⧓ ⧓ ✱ ✱ ● ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ● ● ⧓ ● ⧓ ⧓ ● ⧓
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ● ● ⧓
Hardened steel	H	● ⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

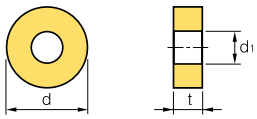
Inserts		Designation		Cermet			Coated																	Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	11	KNUX	160405R11						●	●	●	●	●	●	●	●			●					●			0.008~0.014	0.039~0.236
			160410R11							●		●	●	●	●	●			●								0.012~0.024	0.059~0.236
			160405L11						●	●	●	●	●	●	●	●											0.008~0.014	0.039~0.236
			160410L11							●		●	●	●	●	●											0.012~0.024	0.059~0.236
Roughing	12	KNUX	160405R12							●		●	●	●	●	●											0.008~0.014	0.039~0.236
			160410R12							●		●	●	●	●	●											0.012~0.024	0.059~0.236
			160405L12									●															0.008~0.014	0.039~0.236
			160410L12											●													0.012~0.024	0.059~0.236

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CKJNR/L	B114	CKUNR/L	B141
CKNNR/L	B114		

RN○○

Round Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
84	1	1/4	23/64
86	1	3/8	23/64
106	1.25	3/8	1/2

Workpiece		
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱ ⧓ ⧓ ⧓ ✱ ✱ ● ⧓
Stainless steel	M	⧓ ⧓ ● ⧓ ⧓ ✱ ✱ ● ● ⧓ ⧓ ⧓ ✱ ✱ ● ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ● ● ⧓ ● ⧓ ⧓ ● ⧓
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ● ● ⧓
Hardened steel	H	● ⧓

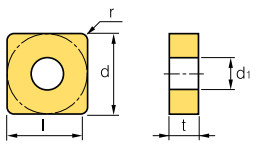
Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated																	Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium to roughing	B25	RNMG	32-B25																								0.004~0.035	0.036~0.177
			43-B25											●													0.005~0.047	0.047~0.189
			54-B25											●													0.006~0.059	0.059~0.295
			64-B25											●													0.007~0.075	0.075~0.299
			84-B25																								0.010~0.098	0.098~0.394
			86-B25											●													0.010~0.098	0.098~0.394
			106-B25																								0.012~0.098	0.138~0.512

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

SN○○

Square 90° Negative

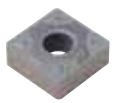
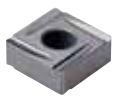


Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece																									
Steel	P	●	⬌	✱	●	⬌	●	●	⬌	⬌	⬌	✱	✱												
Stainless steel	M											⬌	⬌	●	⬌				⬌	✱		●	⬌		
Cast iron	K	●	⬌	✱	●	⬌							⬌			●	⬌	⬌						●	⬌
Non-ferrous metal	N																							●	⬌
Heat resistant alloy, Titanium alloy	S												⬌						⬌	✱	●	●	⬌	●	⬌
Hardened steel	H																					⬌	✱	●	⬌

Machining types

● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

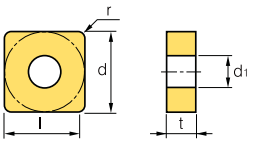
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing		SNGA	321																								0.007~0.020	0.020~0.177
			322																								0.007~0.020	0.020~0.177
			431																								0.006~0.024	0.059~0.315
			432																								0.006~0.024	0.059~0.315
			433																								0.008~0.031	0.059~0.315
			542																								0.008~0.031	0.079~0.394
			543																								0.008~0.035	0.079~0.394
			642																								0.006~0.024	0.118~0.472
			643																								0.008~0.031	0.118~0.472
Finishing	HU 	SNGG	432-HU																								0.004~0.012	0.004~0.012
Medium		SNGG	321R																								0.005~0.014	0.039~0.118
			322R																								0.006~0.014	0.039~0.118
			431R		●																						0.006~0.014	0.039~0.157
			432R																								0.006~0.014	0.039~0.157
			433R																								0.006~0.014	0.039~0.157
			321L																								0.005~0.014	0.039~0.118
			322L																								0.006~0.014	0.039~0.118
			431L																								0.006~0.014	0.039~0.157
			432L																								0.006~0.014	0.039~0.157
			433L																								0.006~0.014	0.039~0.157

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSDNN	B108
MSDNN	B118	MSSNR/L	B120	PSKNR/L	B109, B139
MSKNR/L	B119	PSBNR/L	B108	PSSNR/L	B109

SN○○

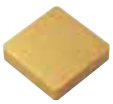
Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
42	1/2	1/8	13/64
43	1/2	3/16	13/64
53	5/8	3/16	1/4

Dimensions(inch)			
Size	d	t	d1
54	5/8	1/4	1/4
64	3/4	1/4~3/16	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ● ⧓ ✱ ✱ ⧓ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ● ⧓ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing		SNGN	320.5																								0.002~0.012	0.020~0.157
			321																								0.004~0.014	0.020~0.157
			322																								0.004~0.016	0.039~0.157
			421																								0.005~0.020	0.051~0.197
			422																								0.006~0.024	0.059~0.236
			423																								0.007~0.024	0.067~0.236
			430.5																								0.004~0.018	0.039~0.197
			431																								0.005~0.020	0.051~0.197
			432																								0.006~0.024	0.059~0.236
			433																								0.007~0.024	0.067~0.236
			436																								0.008~0.026	0.079~0.236
			530.5																								0.004~0.020	0.020~0.236
			532																								0.006~0.024	0.059~0.315
			533																								0.007~0.024	0.079~0.315
			534																								0.008~0.026	0.098~0.335
			630.5																								0.004~0.024	0.079~0.335
			633																								0.007~0.028	0.098~0.394
			634																								0.008~0.030	0.098~0.394
			841																								0.012~0.031	0.118~0.472
			844																								0.014~0.039	0.157~0.472
Medium		SNGX	432R																								0.039~0.157	0.006~0.014
Roughing		SNMA	321																								0.004~0.018	0.020~0.177
			322																								0.006~0.020	0.020~0.177
			323																								0.008~0.020	0.020~0.177
			430.5																								0.004~0.020	0.039~0.177
			431																								0.006~0.024	0.039~0.197
			432																●	●							0.006~0.028	0.039~0.236
			433																●	●							0.008~0.031	0.059~0.236
			434																●	●							0.012~0.039	0.079~0.236
			437.5																								0.012~0.028	0.098~0.197
			543																●								0.008~0.031	0.079~0.315
			544																								0.010~0.033	0.098~0.394
			642																								0.008~0.031	0.079~0.394
			643																●	●							0.008~0.031	0.079~0.394
			644																●	●							0.010~0.033	0.098~0.394
			646																								0.014~0.035	0.118~0.394
			856																								0.016~0.039	0.118~0.512
			866																								0.016~0.039	0.118~0.512

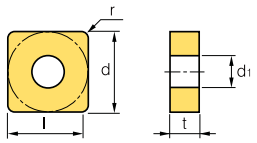
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	**MSRNR/L**	B119	**PSDNN**	B108
MSDNN	B118	**MSSNR/L**	B120	**PSKNR/L**	B109, B139
MSKNR/L	B119	**PSBNR/L**	B108	**PSSNR/L**	B109

SN○○

Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ⬌ ✱ ✱	● Continuous cutting
Stainless steel	M	⬌ ✱ ✱ ⬌ ⬌ ⬌ ⬌ ● ⬌ ⬌ ✱ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ● ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	⬌ ⬌ ● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ✱ ✱ ● ● ⬌ ⬌
Hardened steel	H	⬌ ● ⬌

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VB	SNMG	431-VB	●			●	●																			0.006~0.014	0.012~0.078
			432-VB	●		●	●	●																			0.006~0.016	0.022~0.078
Finishing	VF	SNMG	321-VF																								0.003~0.012	0.020~0.059
			322-VF																								0.003~0.012	0.020~0.059
			431-VF						●																		0.003~0.012	0.020~0.059
			432-VF						●						●												0.004~0.016	0.020~0.059
			433-VF																								0.008~0.020	0.020~0.059
Finishing (Cermet)	VG	SNMG	321-VG																								0.003~0.012	0.020~0.059
			322-VG																								0.004~0.012	0.020~0.059
			431-VG																								0.003~0.012	0.020~0.059
			432-VG																								0.004~0.016	0.020~0.059
Finishing (Mild steel)	VL	SNMG	432-VL						●															●			0.004~0.014	0.008~0.060
Medium to finishing	HA	SNMG	431-HA														●								●	●	0.004~0.014	0.031~0.138
			432-HA																					●	●	●	0.004~0.016	0.031~0.138
			433-HA																								0.005~0.022	0.031~0.138
Medium to finishing	HC	SNMG	431-HC																								0.002~0.014	0.031~0.157
			432-HC																								0.003~0.016	0.031~0.157
Medium to finishing	LP	SNMG	431-LP							●			●	●													0.004~0.014	0.012~0.078
			432-LP							●			●	●													0.004~0.016	0.022~0.098
			433-LP																								0.005~0.018	0.032~0.118

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSDNN	B108
MSDNN	B118	MSSNR/L	B120	PSKNR/L	B109, B139
MSKNR/L	B119	PSBNR/L	B108	PSSNR/L	B109

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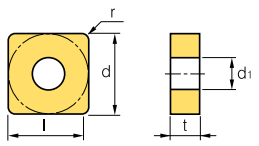
Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ⧓ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓	
Heat resistant alloy, Titanium alloy	S	⧓ ✱ ● ⧓ ● ⧓	
Hardened steel	H	⧓ ✱ ● ⧓	

Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	SNMG 432-VC										●		●													0.006~0.016	0.020~0.157
Medium to finishing	SNMG 431-VP2																	●	●	●	●	●				0.002~0.014	0.004~0.118
	SNMG 432-VP2									●								●	●	●	●	●		●		0.004~0.018	0.020~0.177
	SNMG 433-VP2																	●	●	●	●	●		●		0.004~0.020	0.020~0.197
Medium	SNMG 431-GM																									0.002~0.012	0.035~0.197
	SNMG 432-GM	●					●					●														0.004~0.020	0.039~0.197
	SNMG 433-GM																									0.005~0.024	0.051~0.197
Medium	SNMG 321-HS														●								●			0.002~0.010	0.039~0.098
	SNMG 322-HS																				●					0.004~0.012	0.039~0.098
	SNMG 431-HS														●			●					●			0.002~0.012	0.039~0.177
	SNMG 432-HS														●			●	●		●		●			0.004~0.016	0.039~0.177
	SNMG 433-HS													●				●	●		●		●			0.005~0.022	0.039~0.177
	SNMG 543-HS																						●			0.005~0.022	0.039~0.240
	SNMG 544-HS																									0.006~0.024	0.039~0.177
	SNMG 643-HS																	●	●		●		●			0.005~0.022	0.039~0.299
	SNMG 644-HS																	●			●		●			0.006~0.024	0.039~0.299
Medium	SNMG 321-MP																									0.004~0.016	0.016~0.150
	SNMG 322-MP																									0.006~0.016	0.020~0.157
	SNMG 331-MP																									0.004~0.016	0.016~0.150
	SNMG 332-MP																									0.006~0.016	0.020~0.157
	SNMG 431-MP							●			●		●				●				●	●				0.004~0.016	0.016~0.157
	SNMG 432-MP							●			●		●				●				●	●				0.006~0.018	0.020~0.177
	SNMG 433-MP																									0.006~0.020	0.032~0.197

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSDNN	B108
MSDNN	B118	MSSNR/L	B120	PSKNR/L	B109, B139
MSKNR/L	B119	PSBNR/L	B108	PSSNR/L	B109

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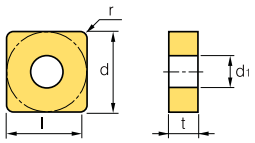
Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4

Dimensions(inch)			
Size	d	t	d1
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece		
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱
Stainless steel	M	⬌ ✱ ● ⬌ ⬌ ✱ ✱ ● ● ⬌ ✱ ● ⬌ ⬌
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ● ⬌ ⬌ ● ⬌
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ⬌ ● ⬌
Hardened steel	H	✱ ● ⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	NC500H	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	VM	SNMG	321-VM																							0.002~0.012	0.035~0.138
			322-VM																							0.004~0.197	0.039~0.138
			431-VM	●				●			●		●	●					●	●							0.002~0.012	0.035~0.197
			432-VM	●						●	●		●	●			●		●	●		●		●			0.004~0.020	0.039~0.197
			433-VM								●			●			●		●	●							0.005~0.024	0.051~0.197
			643-VM																								0.010~0.024	0.098~0.295
Medium	VP3	SNMG	431-VP3																●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			432-VP3																●	●	●	●	●		●	●	0.004~0.018	0.039~0.197
			433-VP3																●	●	●	●	●		●	●	0.005~0.020	0.039~0.197
Medium (Cermet)	VQ	SNMG	321-VQ																								0.002~0.012	0.002~0.138
			322-VQ																								0.003~0.012	0.003~0.157
			431-VQ	●	●																						0.002~0.012	0.031~0.157
			432-VQ	●	●							●															0.003~0.016	0.031~0.157
Medium to roughing	B25	SNMG	322-B25																								0.007~0.018	0.031~0.138
			431-B25	●	●				●		●	●	●	●			●										0.007~0.018	0.039~0.138
			432-B25	●	●				●		●	●	●	●			●	●	●	●			●				0.009~0.024	0.059~0.197
			433-B25		●				●		●	●	●	●			●	●									0.010~0.024	0.079~0.197
			434-B25						●			●	●	●				●									0.014~0.028	0.098~0.197
			435-B25																								0.016~0.028	0.118~0.197
			542-B25										●														0.010~0.024	0.059~0.236
			543-B25																								0.010~0.024	0.079~0.236
			544-B25							●																	0.014~0.028	0.079~0.236
			642-B25						●			●	●					●									0.010~0.024	0.118~0.315
			643-B25				●		●			●	●	●			●	●				●					0.014~0.028	0.118~0.315
			644-B25						●			●	●					●				●					0.014~0.028	0.157~0.472
			854-B25																								0.014~0.028	0.157~0.472
			856-B25						●					●													0.020~0.039	0.197~0.472
			866-B25						●																		0.020~0.039	0.217~0.472
Medium to roughing	GS	SNMG	431-GS																								0.004~0.018	0.031~0.177
			432-GS										●			●			●			●					0.004~0.020	0.039~0.197
			433-GS													●						●					0.005~0.026	0.039~0.197
			434-GS																								0.006~0.028	0.039~0.197
			643-GS													●			●								0.012~0.031	0.067~0.354

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSDNN	B108
MSDNN	B118	MSSNR/L	B120	PSKNR/L	B109, B139
MSKNR/L	B119	PSBNR/L	B108	PSSNR/L	B109

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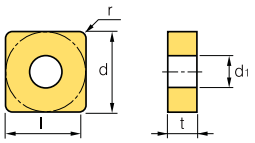
Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
44	1/2	3/16	13/64
54	5/8	1/4	1/4

Dimensions(inch)			
Size	d	t	d1
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
- ● Continuous cutting
- ⧓ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated			Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	SNMG	431-GR																								0.006~0.018	0.003~0.236
			432-GR									●		●	●				●	●							0.008~0.020	0.039~0.276
			433-GR									●		●					●	●							0.008~0.020	0.039~0.276
			542-GR											●														0.010~0.024	0.039~0.276
			543-GR						●		●	●		●														0.011~0.030	0.055~0.276
			642-GR											●						●								0.012~0.031	0.067~0.354
			643-GR								●			●	●					●								0.012~0.031	0.067~0.354
			644-GR								●			●	●													0.012~0.032	0.075~0.484
			856-GR											●														0.018~0.047	0.102~0.551
			866-GR								●			●														0.020~0.047	0.102~0.551
Roughing	HR	SNMG	432-HR																									0.008~0.020	0.039~0.276
			433-HR																									0.010~0.028	0.051~0.276
			443-HR																									0.013~0.030	0.071~0.276
			542-HR																									0.008~0.020	0.071~0.315
			543-HR																									0.008~0.028	0.051~0.315
			544-HR																									0.012~0.031	0.071~0.315
			546-HR																									0.013~0.035	0.087~0.315
			642-HR																									0.008~0.020	0.039~0.394
			643-HR																									0.010~0.028	0.051~0.394
			644-HR											●														0.012~0.031	0.071~0.394
			646-HR																									0.013~0.035	0.091~0.394
			856-HR																									0.016~0.047	0.091~0.591
			866-HR								●																	0.016~0.047	0.091~0.591
Roughing	VK	SNMG	431-VK																●									0.006~0.020	0.031~0.315
			432-VK															●	●									0.008~0.020	0.039~0.276
			433-VK																●									0.008~0.020	0.039~0.276
Roughing	VR	SNMG	432-VR																	●								0.010~0.022	0.047~0.276
			433-VR																	●								0.012~0.024	0.059~0.276
			643-VR						●				●							●								0.014~0.028	0.078~0.394
			644-VR						●				●							●								0.014~0.030	0.087~0.394
Medium	GM	SNMM	432-GM																									0.004~0.020	0.039~0.197
			433-GM																									0.005~0.024	0.051~0.197

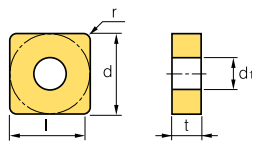
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSSNR/L	B109
MSDNN	B118	MSSNR/L	B120	PSDNN	B108
MSKNR/L	B119	PSBNR/L	B108	PSKNR/L	B109, B139

SN○○

Square 90° Negative



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece																									
Steel	P	●	⬌	✱	●	⬌	●	●	⬌	⬌	⬌	⬌	✱	✱											
Stainless steel	M											⬌	⬌	⬌	●	⬌					⬌	✱		●	⬌
Cast iron	K	●	⬌	✱	●	⬌							⬌				●	⬌	⬌					●	⬌
Non-ferrous metal	N																							●	⬌
Heat resistant alloy, Titanium alloy	S												⬌							⬌	✱	●	●	⬌	●	⬌
Hardened steel	H																				⬌	✱		●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	SNMM	432-GR																							0.008~0.020	0.039~0.276
			433-GR											●												0.010~0.026	0.051~0.276
			643-GR											●												0.010~0.026	0.051~0.453
			644-GR																							0.013~0.033	0.071~0.453
Heavy	GH	SNMM	432-GH									●		●	●											0.012~0.024	0.000~0.001
			433-GH									●		●												0.012~0.028	0.000~0.001
			543-GH									●		●												0.012~0.028	0.098~0.315
			643-GH							●	●			●	●											0.012~0.028	0.118~0.315
			644-GH						●	●	●			●	●											0.018~0.039	0.157~0.354
			646-GH							●	●			●	●											0.022~0.047	0.157~0.354
			856-GH							●	●			●	●											0.022~0.047	0.197~0.472
			866-GH						●	●	●			●	●											0.022~0.047	0.197~0.472
			868-GH																							0.022~0.047	0.197~0.472
Heavy (General)	VH	SNMM	643-VH							●																0.020~0.036	0.197~0.394
			644-VH							●																0.020~0.043	0.197~0.394
			646-VH							●																0.024~0.047	0.236~0.472
			854-VH																							0.028~0.059	0.236~0.591
			856-VH							●				●												0.028~0.055	0.236~0.591
			865-VH																							0.028~0.055	0.236~0.591
			866-VH						●	●																0.028~0.055	0.236~0.551
Heavy (High feed cutting)	VT	SNMM	643-VT							●					●											0.024~0.036	0.236~0.512
			644-VT							●				●												0.024~0.043	0.236~0.512
			646-VT						●	●																0.024~0.063	0.276~0.512
			854-VT																							0.030~0.063	0.276~0.591
			856-VT							●				●												0.030~0.063	0.276~0.591
			865-VT																							0.030~0.063	0.276~0.591
			866-VT						●	●				●												0.030~0.063	0.276~0.669

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	MSRNR/L	B119	PSSNR/L	B109
MSDNN	B118	MSSNR/L	B120	PSDNN	B108
MSKNR/L	B119	PSBNR/L	B108	PSKNR/L	B109, B139

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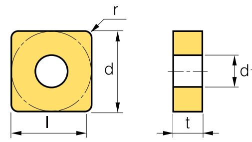
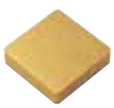


Square 90° Negative

Dimensions(inch)			
Size	d	t	d1
42	1/2	1/8	-
43	1/2	3/16	13/64
53	5/8	3/16	-
63	3/4	3/16	-
86	1	5/16	-

Machining types: ● Continuous cutting · ◆ General cutting · ✱ Interrupted cutting

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	ST30A
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Inserts	Designation	CN1500 (Cermet)	CN2000 (Cermet)	CN2500 (Cermet)	CC1500 (Coated)	CC2500 (Coated)	NC3010 (Coated)	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01 (Uncoated)	ST30A (Uncoated)	fn (ipr)	ap (inch)
Medium to roughing 	SNMN 421																									0.007~0.018	0.039~0.138
	422																									0.009~0.024	0.059~0.236
	423																									0.010~0.024	0.079~0.197
	431																									0.007~0.018	0.039~0.138
	432																									0.009~0.024	0.059~0.197
	433																									0.010~0.024	0.079~0.197
	531																									0.008~0.020	0.059~0.236
	532																									0.010~0.024	0.059~0.236
	533																									0.010~0.024	0.079~0.236
	634																									0.014~0.028	0.079~0.236
Medium 	SNMX 432R																									0.006~0.014	0.039~0.157
Medium to roughing 	SNUN 432																								●	0.009~0.024	0.059~0.197
	433																									0.010~0.024	0.079~0.197
	633																									0.012~0.039	0.118~0.394
	433TN																									0.010~0.024	0.079~0.197
	866TN																									0.012~0.047	0.118~0.472

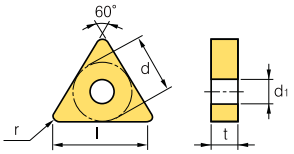
Cutting edge geometry **A38 ~ A43** · Recommended chip breaker **B04 ~ B11** · Code system **B18 ~ B19**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B118	**MSRNR/L**	B119	**PSSNR/L**	B109
MSDNN	B118	**MSSNR/L**	B120	**PSDNN**	B108
MSKNR/L	B119	**PSBNR/L**	B108	**PSKNR/L**	B109, B139

TN○○

Triangular 60° Negative



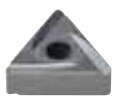
Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8~3/16	3/32
32	3/8	1/8	5/32
33	1/2	3/16	5/32

Dimensions(inch)			
Size	d	t	d1
42	1/2	1/8	13/64
43	1/2	3/16	13/64
54	5/8	1/4	1/4

Workpiece																								
Steel	P	●	⇄	✱	●	⇄	●	●	⇄	⇄	⇄	✱	✱											
Stainless steel	M											⇄	⇄	●	⇄				⇄	✱		●	⇄	
Cast iron	K	●	⇄	✱	●	⇄							⇄			●	⇄	⇄						●	⇄
Non-ferrous metal	N																							●	⇄
Heat resistant alloy, Titanium alloy	S											⇄							⇄	✱	●	●	⇄	●	⇄
Hardened steel	H																					⇄	✱	●	⇄

Machining types

● Continuous cutting
⇄ General cutting
✱ Interrupted cutting

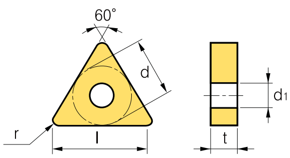
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing		TNGA	220.5																							0.002~0.012	0.008~0.118
			221																							0.002~0.012	0.016~0.118
			321																							0.004~0.014	0.016~0.157
			330.5																							0.004~0.012	0.008~0.157
			331																							0.004~0.014	0.016~0.197
			332																							0.005~0.016	0.020~0.197
			421																							0.004~0.014	0.020~0.197
			430.5																							0.002~0.012	0.008~0.118
			431																							0.004~0.014	0.016~0.197
			432																							0.004~0.016	0.020~0.197
			433																							0.005~0.018	0.039~0.217
			543																							0.005~0.018	0.039~0.276
			546																							0.008~0.022	0.079~0.276
Finishing	SC 	TNGG	330.5R-SC		●																					0.001~0.008	0.004~0.059
			331R-SC		●																					0.002~0.010	0.012~0.079
			330.5L-SC																							0.001~0.008	0.004~0.059
			331L-SC																							0.002~0.010	0.012~0.079
Medium		TNGG	221R																							0.002~0.012	0.002~0.010
			330.5R		●																					0.003~0.012	0.020~0.138
			331R	●	●																					0.005~0.012	0.039~0.138
			332R		●																					0.006~0.014	0.051~0.138
			431R		●																					0.005~0.012	0.039~0.197
			432R		●																					0.006~0.014	0.051~0.197
			433R																							0.007~0.016	0.059~0.197
			221L																							0.002~0.012	0.002~0.010
			330.5L																							0.003~0.012	0.020~0.138
			331L	●	●																					0.005~0.012	0.039~0.138
			332L		●																					0.006~0.014	0.051~0.138
			431L																							0.005~0.012	0.039~0.197
			432L																							0.006~0.014	0.051~0.197
			433L																							0.007~0.016	0.059~0.197

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

TN○○



Triangular 60° Negative

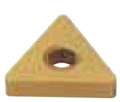
Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	3/32
32	3/8	1/8	5/32
33	3/8	3/16	5/32

Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
66	3/4	3/8	5/16

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Machining types

- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

Inserts	Designation		Cermet			Coated		Coated																	Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium 	TNGN	220.5																									0.002~0.010	0.008~0.098
		221																									0.004~0.012	0.020~0.098
		222																									0.004~0.012	0.031~0.098
		320.5																									0.002~0.012	0.008~0.118
		321																									0.004~0.012	0.020~0.157
		322																									0.004~0.016	0.031~0.157
		331																									0.004~0.016	0.020~0.157
		332																									0.004~0.016	0.039~0.157
		333																									0.004~0.020	0.059~0.177
		431																									0.004~0.014	0.039~0.157
		432																									0.006~0.016	0.059~0.197
		433																									0.008~0.020	0.059~0.197
		434																									0.010~0.022	0.059~0.197
		436																									0.012~0.026	0.079~0.197
		547.5																									0.014~0.028	0.079~0.197
Roughing 	TNMA	222																									0.002~0.012	0.020~0.118
		331																●	●								0.004~0.012	0.039~0.157
		332																●	●								0.004~0.016	0.039~0.157
		333																●	●								0.004~0.020	0.059~0.177
		334																	●								0.006~0.022	0.059~0.177
		431																									0.004~0.014	0.039~0.157
		432																●	●								0.006~0.016	0.059~0.197
		433																●	●								0.008~0.020	0.059~0.197
		434																	●								0.010~0.022	0.059~0.197
		435																									0.012~0.026	0.079~0.197
		438																									0.014~0.028	0.079~0.197
		542																									0.008~0.018	0.079~0.276
		543																									0.010~0.022	0.118~0.276
		544																									0.012~0.026	0.118~0.276
		666																									0.014~0.030	0.118~0.354
Finishing VB 	TNMG	331-VB	●		●	●	●																				0.004~0.014	0.012~0.059
		332-VB	●		●	●	●		●			●		●									●				0.006~0.018	0.020~0.276
		432-VB										●		●													0.006~0.018	0.020~0.098
		433-VB																									0.008~0.020	0.039~0.276

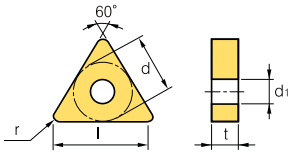
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

TN○○

Triangular 60° Negative



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Workpiece		
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱
Stainless steel	M	⬌ ✱ ✱ ⬌ ⬌ ⬌ ● ⬌ ⬌ ⬌ ● ⬌
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ⬌ ● ⬌
Non-ferrous metal	N	⬌ ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ⬌ ⬌ ⬌ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VL	TNMG	331-VL	●					●			●												●				0.002~0.010	0.004~0.039
			332-VL	●					●			●			●													0.004~0.014	0.008~0.059
			333-VL																									0.006~0.016	0.008~0.059
			432-VL																									0.004~0.014	0.008~0.059
			433-VL																									0.004~0.014	0.020~0.078
Finishing	VF	TNMG	221-VF	●	●										●													0.002~0.079	0.008~0.039
			331-VF	●					●		●				●									●				0.003~0.012	0.020~0.059
			332-VF						●	●	●	●			●													0.004~0.016	0.020~0.059
			333-VF																									0.006~0.020	0.020~0.059
			431-VF												●										●			0.004~0.016	0.020~0.059
			432-VF																									0.004~0.016	0.020~0.059
Finishing (Cermet)	VG	TNMG	221-VG																									0.002~0.008	0.008~0.039
			331-VG	●	●																							0.003~0.012	0.020~0.059
			332-VG	●																								0.004~0.016	0.020~0.059
			431-VG																									0.004~0.016	0.020~0.059
Finishing (wiper)	VW	TNMG	331-VW																									0.004~0.014	0.012~0.118
			332-VW																●									0.004~0.016	0.012~0.118
Medium to finishing	HA	TNMG	331-HA													●								●		●		0.002~0.012	0.031~0.138
			332-HA														●							●	●	●		0.004~0.016	0.031~0.138
			333-HA																									0.005~0.022	0.031~0.138
			432-HA																						●			0.004~0.016	0.031~0.209
Medium to finishing	HC	TNMG	331-HC																									0.002~0.014	0.020~0.138
			332-HC								●				●													0.003~0.016	0.031~0.157
			333-HC																									0.005~0.020	0.035~0.157
			432-HC																									0.003~0.016	0.031~0.157

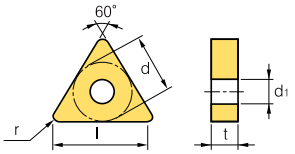
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

TN○○

Triangular **60° Negative**



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ● ⧓ ⧓ ● ●	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ⧓ ● ●	✱ Interrupted cutting
Non-ferrous metal	N	⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ● ●	
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ● ●	
Hardened steel	H	⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ● ●	

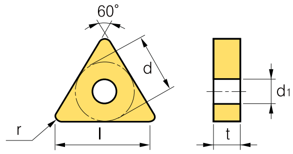
Inserts		Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	LP	TNMG 331-LP							●			●		●													0.004~0.014	0.012~0.078
		332-LP							●			●		●													0.004~0.016	0.020~0.098
		333-LP																									0.005~0.018	0.032~0.118
Medium to finishing	VC	TNMG 331-VC						●			●	●		●													0.004~0.014	0.012~0.079
		332-VC							●		●	●		●													0.006~0.016	0.020~0.118
		333-VC										●		●													0.006~0.018	0.020~0.118
		432-VC										●															0.006~0.016	0.020~0.118
		433-VC																									0.006~0.018	0.020~0.118
Medium to finishing	VP2	TNMG 331-VP2																	●	●	●	●	●				0.002~0.012	0.004~0.118
		332-VP2																	●	●	●	●	●				0.004~0.018	0.020~0.197
		333-VP2																		●	●	●	●		●		0.005~0.022	0.032~0.130
		431-VP2																	●	●		●					0.002~0.012	0.032~0.197
		432-VP2																	●	●		●					0.004~0.016	0.032~0.197
Medium to finishing (Cermet)	VQ	TNMG 221-VQ																									0.002~0.012	0.020~0.138
		331-VQ	●	●	●	●	●																				0.002~0.014	0.020~0.138
		332-VQ	●	●	●	●	●					●															0.003~0.016	0.031~0.157
		431-VQ																									0.002~0.014	0.020~0.157
Medium	GM	TNMG 331-GM		●									●														0.002~0.012	0.032~0.197
		332-GM		●						●			●														0.004~0.020	0.039~0.197
		333-GM											●														0.005~0.024	0.051~0.197
		431-GM											●														0.002~0.012	0.036~0.248
		432-GM											●														0.004~0.020	0.039~0.260
		433-GM											●														0.005~0.024	0.051~0.260

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	**PTGNR/L**	B110
MTFNR/L	B120	**PTTNR/L**	B111
MTGNR/L	B121	**WTENN**	B112
MTJNR/L	B121	**WTJNR/L**	B112
PTFNR/L	B110,140	**WTXNR/L**	B112

TN○○



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Triangular 60° Negative

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆			◆	✱		●	◆	◆		
Cast iron	K	●	◆	✱	●	◆							◆			◆	◆							●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆					◆	✱	●	●	◆		●	◆
Hardened steel	H																				◆	✱		●	◆

Machining types

- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

Inserts	Designation	Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3010	Coated NC3215	Coated NC3120	Coated NC3220	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC9020	Coated NC9025	Coated NC6210	Coated NC6215	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Medium HS 	TNMG 331-HS														●			●	●		●		●			0.003~0.014	0.020~0.157
	332-HS														●			●	●		●		●			0.004~0.016	0.039~0.177
	333-HS																	●	●				●			0.005~0.022	0.039~0.177
	431-HS																	●	●							0.002~0.012	0.036~0.248
	432-HS														●			●	●		●		●			0.004~0.016	0.039~0.248
	433-HS																	●	●				●			0.005~0.022	0.039~0.248
Medium MP New 	TNMG 331-MP							●			●		●				●			●	●					0.004~0.016	0.016~0.138
	332-MP							●			●		●				●			●	●					0.006~0.018	0.020~0.157
	333-MP							●			●		●				●			●	●					0.006~0.020	0.032~0.177
	431-MP																									0.004~0.014	0.016~0.197
	432-MP																									0.006~0.018	0.020~0.217
	433-MP																									0.006~0.020	0.032~0.236
	434-MP																									0.008~0.022	0.039~0.236
Medium VM 	TNMG 222-VM																									0.002~0.012	0.031~0.157
	331-VM	●	●				●		●	●		●	●			●		●	●							0.002~0.012	0.035~0.197
	332-VM	●	●	●			●	●	●	●	●	●	●			●		●	●				●			0.004~0.020	0.039~0.197
	333-VM	●	●					●	●	●		●						●	●							0.005~0.024	0.051~0.197
	431-VM									●								●	●							0.002~0.012	0.035~0.260
	432-VM								●	●			●					●	●		●					0.004~0.020	0.039~0.260
	433-VM											●														0.005~0.024	0.051~0.260
Medium VP3 	TNMG 331-VP3																	●	●	●	●	●				0.002~0.012	0.004~0.118
	332-VP3																	●	●	●	●	●				0.004~0.018	0.020~0.197
Medium (wiper) LW 	TNMG 332-LW						●																			0.006~0.020	0.028~0.177
	333-LW																									0.008~0.024	0.039~0.197

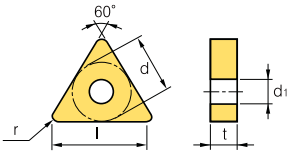
Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

TN○○

Triangular 60° Negative



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	3/32
32	3/8	1/8	5/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Dimensions(inch)			
Size	d	t	d1
54	5/8	1/4	1/4
65	3/4	5/16	5/16
66	3/4	3/8	5/16

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to roughing	TNMG 222-B25																									0.007~0.016	0.059~0.118
	TNMG 321-B25																									0.007~0.018	0.079~0.138
	TNMG 322-B25											●														0.007~0.022	0.079~0.138
	TNMG 323-B25																									0.010~0.022	0.079~0.138
	TNMG 324-B25																									0.012~0.024	0.098~0.118
	TNMG 331-B25	●	●					●		●	●	●	●				●	●								0.007~0.018	0.079~0.138
	TNMG 332-B25	●	●					●		●	●	●	●				●	●					●			0.007~0.022	0.079~0.138
	TNMG 333-B25		●					●			●	●	●					●								0.010~0.022	0.079~0.138
	TNMG 334-B25																●	●								0.012~0.024	0.098~0.118
	TNMG 431-B25							●		●	●	●	●													0.007~0.018	0.059~0.197
	TNMG 432-B25							●		●	●	●	●					●								0.007~0.022	0.079~0.197
	TNMG 433-B25							●			●	●	●					●								0.010~0.022	0.079~0.197
	TNMG 434-B25							●			●	●	●					●								0.012~0.024	0.079~0.197
	TNMG 436-B25																									0.014~0.028	0.118~0.276
	TNMG 438-B25																									0.016~0.030	0.138~0.276
	TNMG 542-B25											●														0.007~0.022	0.079~0.197
	TNMG 543-B25						●				●	●	●													0.010~0.022	0.118~0.276
	TNMG 544-B25																									0.012~0.024	0.118~0.276
	TNMG 654-B25							●			●															0.014~0.028	0.118~0.354
	TNMG 666-B25																									0.016~0.031	0.118~0.354
Medium to roughing	TNMG 331-GS														●							●	●			0.002~0.014	0.039~0.177
	TNMG 332-GS														●				●			●	●			0.004~0.020	0.039~0.197
	TNMG 333-GS																									0.005~0.026	0.039~0.197
	TNMG 432-GS																					●				0.004~0.020	0.039~0.268
	TNMG 433-GS																									0.006~0.020	0.047~0.236
Roughing	TNMG 322-GR									●		●					●	●								0.008~0.020	0.039~0.276
	TNMG 333-GR									●		●					●									0.009~0.021	0.047~0.315
	TNMG 432-GR								●	●		●	●				●	●								0.009~0.024	0.043~0.307
	TNMG 433-GR								●	●		●					●	●								0.011~0.031	0.047~0.307
	TNMG 434-GR									●		●						●								0.012~0.030	0.059~0.307
	TNMG 542-GR											●														0.012~0.030	0.059~0.307
	TNMG 543-GR									●		●														0.012~0.030	0.059~0.307
	TNMG 544-GR											●														0.014~0.039	0.063~0.307
	TNMG 666-GR											●														0.016~0.039	0.079~0.354


B25

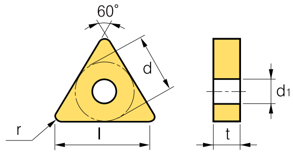

GS


GR

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

TN○○

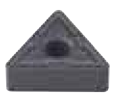


Triangular 60° Negative

Size	d	t	d1
Dimensions(inch)			
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
65	3/4	5/16	5/16
66	3/4	3/8	5/16

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Machining types
- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

Inserts	Designation	Cermet: CN1500	Cermet: CN2000	Cermet: CN2500	Coated: CC1500	Coated: CC2500	Coated: NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	Uncoated: H01	Uncoated: H05	Cutting Condition: fn (ipr)	Cutting Condition: ap (inch)
Roughing HR 	TNMG 332-HR						●																			0.008~0.020	0.039~0.276
	333-HR								●																	0.010~0.024	0.051~0.276
	431-HR																									0.008~0.018	0.039~0.295
	432-HR																									0.008~0.020	0.039~0.315
	433-HR																									0.010~0.024	0.051~0.315
	434-HR																									0.013~0.028	0.071~0.315
	542-HR																									0.014~0.020	0.071~0.512
	543-HR																									0.014~0.028	0.091~0.512
	548-HR																									0.016~0.035	0.118~0.512
	654-HR																									0.016~0.028	0.071~0.354
	666-HR																									0.018~0.035	0.130~0.630
Roughing VK 	TNMG 331-VK																●									0.006~0.020	0.032~0.197
	332-VK															●	●									0.008~0.020	0.039~0.217
	334-VK																●									0.006~0.020	0.059~0.217
	432-VK																●									0.006~0.022	0.039~0.217
	433-VK																●									0.010~0.024	0.059~0.236
	434-VK																									0.010~0.024	0.078~0.236
Roughing VR 	TNMG 332-VR																	●								0.010~0.022	0.047~0.276
	333-VR																	●								0.014~0.026	0.067~0.276
	334-VR																	●								0.014~0.028	0.078~0.394
	432-VR																	●								0.014~0.028	0.078~0.394
	433-VR																	●								0.014~0.028	0.078~0.394
	434-VR																	●								0.014~0.030	0.087~0.394
Medium GM 	TNMM 333-GM																									0.005~0.024	0.051~0.197
	432-GM																									0.004~0.020	0.039~0.260
	433-GM																									0.005~0.024	0.051~0.260
	434-GM																									0.006~0.026	0.059~0.276
Roughing GR 	TNMM 432-GR																									0.009~0.024	0.043~0.307
	433-GR																									0.011~0.031	0.047~0.307
	434-GR																									0.012~0.030	0.059~0.307

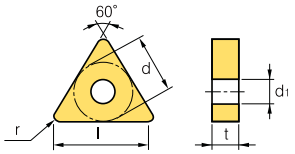
Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Designation	Page	Designation	Page
Available tool holders			
MTENN	B120	**PTGNR/L**	B110
MTFNR/L	B120	**PTTNR/L**	B111
MTGNR/L	B121	**WTENN**	B112
MTJNR/L	B121	**WTJNR/L**	B112
PTFNR/L	B110,140	**WTXNR/L**	B112

TN○○

Triangular 60° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
66	3/4	3/8	5/16

Workpiece			P			M		K		N	S	H
	Steel	P	●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱																
	Stainless steel	M											⧓	⧓	●	⧓					⧓	✱		●	⧓				
	Cast iron	K	●	⧓	✱	●	⧓						⧓				●	⧓	⧓							●	⧓		
	Non-ferrous metal	N																								●	⧓		
	Heat resistant alloy, Titanium alloy	S											⧓								⧓	✱	●	●	⧓	●	⧓		
	Hardened steel	H																						⧓	✱	●	⧓		

Machining types
- ● Continuous cutting
- ⧓ General cutting
- ✱ Interrupted cutting

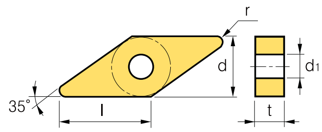
Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Heavy	GH	TNMM	332-GH											●														0.008~0.020	0.039~0.276
			432-GH																									0.010~0.024	0.051~0.276
			433-GH											●														0.008~0.020	0.039~0.315
			434-GH											●														0.010~0.024	0.051~0.315
			544-GH																									0.013~0.028	0.071~0.315
			546-GH																									0.014~0.020	0.071~0.512
			666-GH																									0.014~0.028	0.091~0.512
Medium to roughing		TNMN	332																									0.004~0.012	0.039~0.157
			432		●																							0.006~0.016	0.059~0.197
			433																									0.008~0.020	0.059~0.197
Medium (Shaft)	SH	TNMX	331R-SH																									0.006~0.012	0.020~0.157
			332R-SH																									0.006~0.018	0.039~0.157
			331L-SH																									0.006~0.012	0.020~0.157
			332L-SH																									0.006~0.018	0.039~0.157
Medium to roughing		TNMX	330.5R		●	●																						0.004~0.012	0.020~0.118
			331R		●						●	●		●	●													0.005~0.012	0.039~0.138
			332R									●		●														0.006~0.014	0.051~0.134
			431R																									0.005~0.012	0.039~0.197
			432R																									0.006~0.014	0.051~0.197
			331L		●						●	●		●														0.005~0.012	0.039~0.138
			332L								●			●														0.006~0.014	0.051~0.134

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

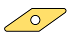
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MTENN	B120	PTGNR/L	B110
MTFNR/L	B120	PTTNR/L	B111
MTGNR/L	B121	WTENN	B112
MTJNR/L	B121	WTJNR/L	B112
PTFNR/L	B110,140	WTXNR/L	B112

VN○○



Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32



Rhombic **35° Negative**

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P	●	⬍	✱	●	⬍	●	●	⬍	⬍	⬍	✱	✱												
Stainless steel	M											⬍	⬍	●	⬍				⬍	✱		●	⬍		
Cast iron	K	●	⬍	✱	●	⬍							⬍			●	⬍	⬍						●	⬍
Non-ferrous metal	N																							●	⬍
Heat resistant alloy, Titanium alloy	S												⬍						⬍	✱	●	●	⬍	●	⬍
Hardened steel	H																					⬍	✱	●	⬍

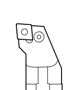
Machining types
- ● Continuous cutting
- ⬍ General cutting
- ✱ Interrupted cutting

	Inserts	Designation		Cermet			Coated		Coated																	Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	HA 	VNGG	332-HA																					●				0.004~0.016	0.031~0.138
Finishing	VB 	VNMG	331-VB	●		●	●	●	●	●			●		●									●				0.004~0.014	0.012~0.059
			332-VB	●		●	●	●		●			●		●													0.006~0.018	0.020~0.079
Finishing	VF 	VNMG	330.5-VF		●						●	●																0.002~0.008	0.012~0.039
			331-VF	●	●				●		●				●				●					●				0.003~0.012	0.020~0.059
			332-VF	●							●		●		●													0.004~0.016	0.020~0.059
			333-VF																									0.006~0.020	0.020~0.059
Finishing (Cermet)	VG 	VNMG	331-VG	●																								0.002~0.008	0.020~0.059
			332-VG	●																								0.003~0.012	0.020~0.059
Finishing (Mild steel)	VL 	VNMG	331-VL	●		●			●			●			●													0.002~0.008	0.004~0.040
			332-VL	●		●			●			●	●		●													0.004~0.010	0.008~0.059
Medium to finishing	HA 	VNMG	331-HA																					●		●		0.003~0.014	0.020~0.118
			332-HA																					●				0.004~0.016	0.032~0.138
Medium to finishing	LP New 	VNMG	331-LP																									0.004~0.014	0.012~0.059
			332-LP																									0.004~0.016	0.020~0.078
			333-LP																									0.004~0.018	0.032~0.098
Medium to finishing	VC 	VNMG	331-VC	●			●						●															0.004~0.014	0.012~0.079
			332-VC	●									●															0.006~0.016	0.020~0.118

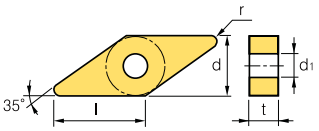
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B121	**MVVNN**	B122
MVQNR/L	B122	**MVUNR/L**	B143



VN○○



Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	5/32

Rhombic 35° Negative

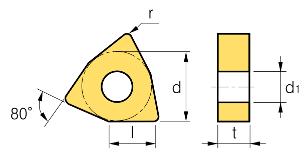
Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing (Cermet)	VQ	VNMG 331-VQ	●	●	●	●	●					●															0.004~0.016	0.020~0.138
		VNMG 332-VQ	●	●	●	●	●					●															0.005~0.018	0.020~0.138
Medium	GM	VNMG 331-GM	●	●	●								●														0.003~0.018	0.020~0.138
		VNMG 332-GM	●		●																						0.004~0.020	0.039~0.197
Medium	HS	VNMG 331-HS														●			●	●		●		●			0.003~0.014	0.020~0.157
		VNMG 332-HS																	●	●		●		●			0.004~0.016	0.039~0.177
Medium	MP	VNMG 331-MP							●			●	●	●				●				●					0.004~0.016	0.016~0.138
		VNMG 332-MP							●			●	●	●				●				●					0.006~0.018	0.020~0.157
		VNMG 333-MP																									0.006~0.020	0.032~0.177
Medium	VP3	VNMG 331-VP3																	●	●	●	●	●			●	0.002~0.012	0.004~0.118
		VNMG 332-VP3																	●	●		●	●				0.004~0.018	0.020~0.197
Medium	VM	VNMG 331-VM	●					●			●		●	●			●		●	●							0.003~0.018	0.020~0.138
		VNMG 332-VM	●					●		●	●	●	●	●			●		●	●		●		●			0.004~0.020	0.039~0.157
		VNMG 333-VM																									0.008~0.020	0.059~0.157
		VNMG 431-VM																									0.003~0.018	0.039~0.197
		VNMG 432-VM																									0.004~0.020	0.059~0.197
Medium to roughing	HR	VNMG 332-HR																									0.004~0.020	0.039~0.157
Roughing	VK	VNMG 333-VK															●										0.006~0.020	0.031~0.157

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B121	MVVNN	B122
MVQNR/L	B122	MVUNR/L	B143

WN○○

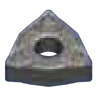


Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Trigon 80° Negative

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05
Steel	P	●	◒	✱	●	◒	●	●	◒	◒	◒	✱	✱												
Stainless steel	M											◒	◒	●	◒				◒	✱		●	◒		
Cast iron	K	●	◒	✱	●	◒							◒			●	◒	◒						●	◒
Non-ferrous metal	N																							●	◒
Heat resistant alloy, Titanium alloy	S												◒						◒	✱	●	●		●	◒
Hardened steel	H																					◒		●	◒

Machining types
- ● Continuous cutting
- ◒ General cutting
- ✱ Interrupted cutting

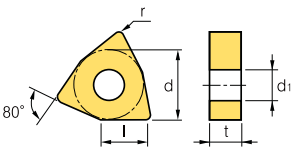
	Inserts	Designation	Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3010	Coated NC3215	Coated NC3120	Coated NC3220	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC9020	Coated NC9025	Coated NC6205	Coated NC6210	Coated NC6215	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Roughing		WNMA 331																									0.004~0.012	0.020~0.118
		332																●									0.004~0.012	0.020~0.118
		333																									0.004~0.012	0.039~0.118
		431																	●								0.006~0.024	0.039~0.197
		432															●	●	●								0.006~0.024	0.039~0.236
		433																●	●								0.006~0.028	0.059~0.236
		434																	●								0.006~0.028	0.059~0.236
Finishing	VB 	WNMG 431-VB						●	●			●		●									●				0.004~0.014	0.012~0.059
		432-VB							●			●		●													0.006~0.018	0.020~0.079
Finishing	VF 	WNMG 331-VF		●				●						●													0.003~0.012	0.020~0.059
		332-VF						●																			0.004~0.016	0.020~0.059
		431-VF						●		●				●													0.003~0.012	0.020~0.059
		432-VF									●			●													0.004~0.016	0.020~0.059
		434-VF																									0.008~0.020	0.020~0.059
Finishing (Cermet)	VG 	WNMG 331-VG																									0.003~0.012	0.020~0.059
		332-VG																									0.004~0.016	0.020~0.059
		431-VG	●																								0.003~0.012	0.020~0.059
		432-VG	●																								0.004~0.016	0.020~0.059
Finishing (Mild steel)	VL 	WNMG 331-VL																									0.002~0.010	0.008~0.059
		431-VL																									0.002~0.010	0.004~0.040
		432-VL						●						●													0.004~0.014	0.008~0.060
Finishing (wiper)	VW 	WNMG 431-VW																									0.004~0.012	0.020~0.118
		432-VW																									0.006~0.020	0.020~0.157
Medium to finishing	HA 	WNMG 331-HA																					●	●	●		0.002~0.012	0.031~0.098
		332-HA																						●	●		0.004~0.016	0.031~0.098
		431-HA								●													●	●	●		0.002~0.012	0.031~0.138
		432-HA														●							●	●	●		0.004~0.016	0.031~0.138
		433-HA																									0.005~0.022	0.031~0.138

Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B122	WWLNR/L	B113
PWLNR/L	B140		

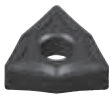
WN○○



Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Trigon **80° Negative**

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

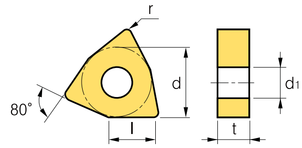
Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	HC 																									
	WNMG 331-HC																									0.002~0.012	0.031~0.157
	WNMG 431-HC																									0.002~0.012	0.031~0.157
	WNMG 432-HC																									0.003~0.016	0.031~0.157
Medium to finishing	LP (New) 																									
	WNMG 431-LP							●			●		●													0.004~0.014	0.012~0.078
	WNMG 432-LP							●			●		●													0.004~0.016	0.020~0.098
	WNMG 433-LP							●			●		●													0.005~0.018	0.032~0.118
Medium to finishing	VC 																									
	WNMG 431-VC																									0.006~0.016	0.006~0.157
	WNMG 432-VC							●		●	●															0.006~0.018	0.006~0.177
	WNMG 433-VC							●			●	●	●													0.006~0.018	0.006~0.177
Medium to finishing	VP2 																									
	WNMG 431-VP2																	●	●		●					0.004~0.018	0.020~0.197
	WNMG 432-VP2																	●	●	●	●	●				0.005~0.020	0.020~0.197
	WNMG 433-VP2																	●	●	●	●	●		●		0.002~0.012	0.004~0.118
Medium to finishing (Cermet)	VQ 																									
	WNMG 331-VQ																									0.002~0.012	0.020~0.157
	WNMG 332-VQ																									0.003~0.012	0.032~0.157
	WNMG 431-VQ	●		●	●	●																				0.002~0.012	0.020~0.157
	WNMG 432-VQ	●		●	●	●					●															0.003~0.016	0.032~0.157
	WNMG 433-VQ										●															0.004~0.014	0.032~0.138
Medium	GM 																									
	WNMG 431-GM																									0.002~0.012	0.036~0.197
	WNMG 432-GM								●			●														0.004~0.020	0.039~0.197
	WNMG 433-GM															●										0.007~0.024	0.012~0.197
Medium	HS 																									
	WNMG 331-HS																	●	●				●			0.002~0.008	0.039~0.098
	WNMG 332-HS														●			●	●		●		●			0.004~0.008	0.039~0.098
	WNMG 333-HS																	●					●			0.004~0.012	0.039~0.138
	WNMG 431-HS														●			●	●		●		●			0.002~0.012	0.039~0.177
	WNMG 432-HS														●			●	●		●		●			0.004~0.016	0.039~0.177
	WNMG 433-HS														●			●	●				●			0.005~0.022	0.039~0.177

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B122	**WWLNR/L**	B113
PWLNR/L	B140		

WN○○

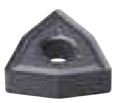


Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Trigon **80° Negative**

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Steel	P	●	◐	✱	●	◐	●	●	◐	◐	◐	✱	✱												
Stainless steel	M											◐	◐	●	◐			◐	✱		●	◐	◐		
Cast iron	K	●	◐	✱	●	◐							◐			◐	◐							●	◐
Non-ferrous metal	N																							●	◐
Heat resistant alloy, Titanium alloy	S												◐					◐	✱	●	●	◐		●	◐
Hardened steel	H																				◐	✱		●	◐

Machining types
- ● Continuous cutting
- ◐ General cutting
- ✱ Interrupted cutting

	Inserts	Designation	Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Medium	MP (New) 	WNMG 431-MP							●			●		●				●			●	●	●				0.004~0.016	0.016~0.157
		432-MP							●			●		●				●			●	●	●				0.006~0.018	0.020~0.177
		433-MP							●			●		●				●			●	●					0.006~0.020	0.032~0.197
		434-MP																									0.007~0.022	0.039~0.197
Medium	VM 	WNMG 330.5-VM																									0.002~0.012	0.035~0.138
		331-VM						●			●		●	●					●	●							0.004~0.018	0.039~0.138
		332-VM						●		●	●	●	●	●			●		●	●							0.004~0.020	0.039~0.157
		333-VM																									0.005~0.024	0.051~0.157
		431-VM								●	●			●			●		●	●							0.002~0.012	0.035~0.197
		432-VM						●		●	●		●	●			●		●	●		●		●			0.004~0.020	0.039~0.197
		433-VM								●	●		●	●			●		●	●							0.004~0.020	0.039~0.197
Medium	VP3 	WNMG 431-VP3																	●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
		432-VP3																	●	●	●	●	●				0.005~0.020	0.020~0.197
		433-VP3																	●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
		434-VP3																									0.005~0.020	0.020~0.197
Medium (wiper)	LW 	WNMG 332-LW																									0.006~0.024	0.020~0.138
		333-LW																									0.008~0.028	0.031~0.138
		432-LW						●						●			●										0.006~0.024	0.039~0.197
		433-LW						●									●										0.008~0.028	0.039~0.236
Medium to roughing	B25 	WNMG 431-B25							●			●		●				●									0.007~0.018	0.039~0.197
		432-B25							●		●	●	●	●			●	●									0.009~0.024	0.059~0.197
		433-B25							●			●		●				●									0.010~0.024	0.079~0.197
Medium to roughing	GS 	WNMG 331-GS																				●					0.002~0.010	0.039~0.118
		332-GS																	●			●					0.004~0.020	0.039~0.157
		333-GS																									0.004~0.020	0.039~0.157
		431-GS																	●			●		●			0.002~0.010	0.039~0.118
		432-GS													●	●			●			●		●			0.004~0.020	0.039~0.197
		433-GS																									0.005~0.026	0.039~0.197

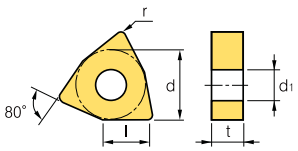
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B122	**WWLNR/L**	B113
PWLNR/L	B140		

WN○○

Trigon 80° Negative



Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
63	3/4	1/4	5/16

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ● ⧓ ✱ ✱ ⧓ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓ ● ●	✱ Interrupted cutting
Non-ferrous metal	N	● ●
Heat resistant alloy, Titanium alloy	S	⧓ ✱ ✱ ● ⧓ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Inserts		Designation	Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	WNMG 431-GR																	●							0.006~0.020	0.003~0.236
		432-GR								●	●		●	●				●	●							0.008~0.020	0.039~0.276
		433-GR						●		●	●		●	●				●	●							0.010~0.020	0.051~0.276
		434-GR						●																			0.010~0.024	0.071~0.236
Roughing	HR	WNMG 332-HR																									0.008~0.016	0.039~0.217
		333-HR																									0.010~0.020	0.043~0.217
		432-HR											●														0.008~0.020	0.039~0.276
		433-HR						●																			0.010~0.026	0.051~0.276
		434-HR																									0.013~0.028	0.071~0.276
Roughing	VK	WNMG 431-VK																●									0.006~0.197	0.031~0.236
		432-VK															●	●									0.008~0.197	0.039~0.276
		433-VK															●	●									0.010~0.197	0.051~0.276
		434-VK																									0.010~0.236	0.071~0.236
Roughing	VR	WNMG 432-VR																	●								0.010~0.022	0.047~0.276
		433-VR																	●								0.012~0.024	0.059~0.276
Medium to roughing	B25	WNMM 542-B25											●														0.012~0.031	0.118~0.315
		643-B25																									0.016~0.035	0.157~0.394
Medium (Shaft)	SH	WNMX 431R-SH																									0.006~0.012	0.039~0.157
		432R-SH																									0.006~0.020	0.059~0.197
		431L-SH																									0.006~0.012	0.039~0.157
		432L-SH																									0.006~0.020	0.059~0.197

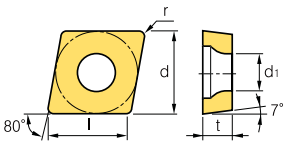
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B122	WWLNR/L	B113
PWLNR/L	B140		

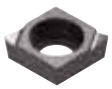
CC○○

Rhombic 80° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
1.2	9/64	7/128	5/64
1.5	11/64	9/128	3/32
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱	● Continuous cutting
Stainless steel	M	⬌ ✱ ⬌ ⬌ ✱ ✱ ● ⬌ ⬌ ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ● ⬌ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ✱ ● ● ⬌ ⬌ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		CCET	1.210.05R																								0.001~0.002	0.004~0.012
			1.210R																								0.001~0.002	0.004~0.012
			1.210.5R																								0.001~0.002	0.004~0.012
			1.211R																								0.001~0.002	0.004~0.012
			1.510.05R																								0.001~0.004	0.004~0.020
			1.510R																								0.001~0.004	0.004~0.020
			1.510.5R																								0.001~0.004	0.004~0.020
			1.511R																								0.001~0.004	0.004~0.020
			1.210.05L																								0.001~0.002	0.004~0.012
			1.210L																								0.001~0.002	0.004~0.012
			1.210.5L		●																			●	●		0.001~0.002	0.004~0.012
			1.211L																								0.001~0.002	0.004~0.012
			1.510.05L																								0.001~0.004	0.004~0.020
			1.510L																								0.001~0.004	0.004~0.020
			1.510.5L		●																			●	●		0.001~0.004	0.004~0.020
			1.511L																								0.001~0.004	0.004~0.020
Finishing (High precision)	KF New 	CCET	21.5MFR-KF																								~0.002	0.002~0.051
			21.50MFR-KF																				●				0.001~0.003	0.002~0.059
			21.50.5MFR-KF																				●				0.001~0.004	0.002~0.067
			32.5MFR-KF																								0.001~0.003	0.002~0.059
			32.50MFR-KF																				●				0.001~0.004	0.002~0.067
			32.50.5MFR-KF																				●				0.002~0.006	0.003~0.079
			21.5MFL-KF																								~0.002	0.002~0.051
			21.50MFL-KF																								0.001~0.003	0.002~0.059
			21.50.5MFL-KF																								0.001~0.004	0.002~0.067
			32.5MFL-KF																								0.001~0.003	0.002~0.059
			32.50MFL-KF																								0.001~0.004	0.002~0.067
			32.50.5MFL-KF																								0.002~0.006	0.003~0.079
Medium to finishing (High precision)	KM New 	CCET	21.5MFR-KM																								~0.002	0.002~0.051
			21.50MFR-KM																				●				0.001~0.003	0.002~0.059
			21.50.5MFR-KM																				●				0.001~0.004	0.002~0.067
			32.5MFR-KM																								0.001~0.003	0.002~0.059
			32.50MFR-KM																				●				0.001~0.004	0.002~0.067
			32.50.5MFR-KM																				●				0.002~0.006	0.003~0.079
			21.5MFL-KM																								~0.002	0.002~0.051
			21.50MFL-KM																								0.001~0.003	0.002~0.059
			21.50.5MFL-KM																								0.001~0.004	0.002~0.067
			32.5MFL-KM																								0.001~0.003	0.002~0.059
			32.50MFL-KM																								0.001~0.004	0.002~0.067
			32.50.5MFL-KM																								0.002~0.006	0.003~0.079

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B123,164	SCLCR/L	B123,144,150,151,164

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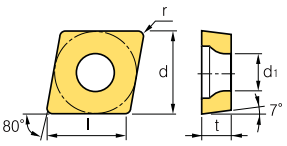

Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Rhombic **80° Positive**
Relief Angle : 7°

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ✱ ● ⬌ ✱ ✱ ● ⬌ ✱ ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	⬌ ⬌ ⬌ ⬌ ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ⬌ ⬌ ⬌ ⬌	
Hardened steel	H	⬌ ✱	

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	C05	CCGT	21.50.5-C05																								0.002~0.004	0.002~0.067
			21.51-C05																								0.003~0.007	0.004~0.067
			32.51-C05																								0.004~0.009	0.004~0.079
			32.52-C05																								0.003~0.012	0.008~0.079
			431-C05																								0.003~0.011	0.004~0.106
			432-C05																								0.003~0.012	0.008~0.106
Finishing	HFP	CCGT	21.50.5-HFP																								0.001~0.002	0.002~0.047
			21.51-HFP																								0.002~0.005	0.004~0.047
			21.52-HFP																								0.002~0.005	0.005~0.055
			32.50.5-HFP																								0.002~0.006	0.003~0.059
			32.51-HFP																								0.002~0.007	0.004~0.059
			32.52-HFP																								0.003~0.010	0.008~0.059
			431-HFP																								0.002~0.008	0.004~0.079
			432-HFP																								0.004~0.010	0.008~0.079
Finishing	KF	CCGT	21.5R-KF																								~0.002	0.002~0.051
			21.50R-KF																								0.001~0.003	0.002~0.059
			21.50.5R-KF																								0.001~0.004	0.002~0.067
			32.5R-KF																								0.001~0.003	0.002~0.059
			32.50R-KF																								0.001~0.004	0.002~0.067
			32.50.5R-KF																								0.002~0.006	0.003~0.079
			21.5L-KF																								~0.002	0.002~0.051
			21.50L-KF																								0.001~0.003	0.002~0.059
			21.50.5L-KF																								0.001~0.004	0.002~0.067
			32.5L-KF																								0.001~0.003	0.002~0.059
			32.50L-KF																								0.001~0.004	0.002~0.067
			32.50.5L-KF																								0.002~0.006	0.003~0.079
Finishing	VP1	CCGT	21.50-VP1																	●		●	●	●		●		0.002~0.003	0.002~0.039
			21.50.5-VP1																	●		●	●			●		0.001~0.004	0.003~0.059
			21.51-VP1																	●		●	●	●		●		0.002~0.005	0.004~0.059
			32.50-VP1																	●		●	●	●		●		0.001~0.005	0.002~0.039
			32.50.5-VP1																	●		●	●	●		●		0.002~0.008	0.004~0.059
			32.51-VP1																	●		●	●	●				0.002~0.006	0.003~0.059

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B123,164	**SCLCR/L**	B123,144,151,164

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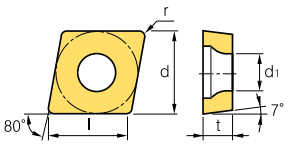
Rhombic 80° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece																									
Steel	P	●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱										●	⧓	
Stainless steel	M											⧓	⧓	●	⧓				⧓	✱			●	⧓	
Cast iron	K	●	⧓	✱	●	⧓							⧓			●	⧓	⧓							
Non-ferrous metal	N																						●	⧓	
Heat resistant alloy, Titanium alloy	S												⧓						⧓	✱	●	●	●	⧓	
Hardened steel	H																						●	⧓	

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	VP1	CCGT	21.50MFN-VP1																				●				~0.002	0.002~0.051
			21.50.5MFN-VP1																				●				0.002~0.003	0.002~0.039
			21.51MFN-VP1																				●				0.002~0.004	0.003~0.059
			32.50MFN-VP1																				●				0.005~0.005	0.004~0.059
			32.50.5MFN-VP1																				●				0.002~0.006	0.003~0.059
			32.51MFN-VP1																				●				0.005~0.008	0.004~0.059
Medium to finishing	KM	CCGT	21.5R-KM																								~0.002	0.002~0.051
			21.50R-KM																								0.001~0.003	0.002~0.059
			21.50.5R-KM																					●			0.001~0.004	0.002~0.067
			32.5R-KM																								0.001~0.003	0.002~0.059
			32.50R-KM																								0.001~0.004	0.002~0.067
			32.50.5R-KM																								0.002~0.006	0.003~0.079
			21.5L-KM																								~0.002	0.002~0.051
			21.50L-KM																								0.001~0.003	0.002~0.059
			21.50.5L-KM																								0.001~0.004	0.002~0.067
			32.5L-KM																								0.001~0.003	0.002~0.059
			32.50L-KM																								0.001~0.004	0.002~0.067
			32.50.5L-KM																								0.002~0.006	0.003~0.079
Finishing	HFP	CCMT	21.50.5-HFP																								0.001~0.002	0.003~0.047
			21.51-HFP																								0.002~0.005	0.004~0.047
			21.52-HFP																								0.002~0.005	0.004~0.055
			32.50.5-HFP																								0.002~0.006	0.003~0.059
			32.51-HFP																								0.002~0.007	0.004~0.059
			32.52-HFP																								0.003~0.010	0.008~0.059
			431-HFP																								0.003~0.009	0.004~0.079
			432-HFP																								0.003~0.012	0.005~0.087
Finishing	VF	CCMT	21.50.5-VF						●				●								●			●			0.002~0.008	0.001~0.040
			21.51-VF	●		●			●			●	●						●		●			●			0.004~0.010	0.001~0.040
			32.50.5-VF						●				●											●			0.002~0.006	0.003~0.060
			32.51-VF	●	●	●			●			●	●						●		●			●			0.002~0.008	0.012~0.060
			32.52-VF			●							●		●				●		●						0.004~0.010	0.012~0.060
			431-VF						●				●						●								0.003~0.009	0.004~0.080

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B123,164	SCLCR/L	B123,144,151,164

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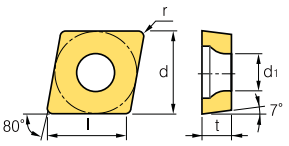
Rhombic 80° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece			
Steel	P	●	⧓
Stainless steel	M	⧓	✱
Cast iron	K		
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Machining types
- ● Continuous cutting
- ⧓ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated			Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VL	CCMT	21.51-VL	●		●	●	●		●			●		●					●	●	●	●	●				0.002~0.004	0.003~0.036
			32.51-VL	●		●	●	●	●	●			●		●					●	●	●	●	●		●	●	0.002~0.004	0.004~0.039
			32.52-VL	●		●	●	●		●			●		●					●	●	●	●	●		●	●	0.003~0.006	0.004~0.039
Medium to finishing	HMP	CCMT	21.50.5-HMP	●					●			●											●	●				0.001~0.005	0.004~0.059
			21.51-HMP	●	●	●			●		●	●		●	●	●		●		●			●	●				0.002~0.007	0.008~0.094
			21.52-HMP						●			●		●	●								●	●				0.003~0.009	0.016~0.094
			32.50.5-HMP		●							●			●								●	●				0.003~0.009	0.004~0.079
			32.51-HMP	●	●	●			●		●	●		●	●	●		●		●			●	●				0.003~0.009	0.012~0.118
			32.52-HMP	●	●	●			●		●	●		●	●			●	●	●			●	●				0.004~0.012	0.020~0.118
			431-HMP		●						●	●		●				●		●				●				0.004~0.011	0.012~0.142
			432-HMP						●		●	●		●	●			●		●				●				0.009~0.014	0.020~0.142
			433-HMP																									0.006~0.017	0.028~0.142
Medium to finishing	MP	CCMT	21.50.5-MP	●		●	●	●		●			●		●					●	●	●	●	●				0.002~0.005	0.008~0.059
			21.51-MP	●		●	●	●		●			●		●					●	●	●	●	●				0.002~0.006	0.012~0.059
			32.50.5-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.003~0.006	0.012~0.078
			32.51-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.003~0.010	0.020~0.098
			32.52-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.004~0.012	0.020~0.098
Medium	C25	CCMT	21.50.5-C25	●	●	●	●	●		●		●	●	●	●					●	●		●					0.001~0.005	0.016~0.079
			21.51-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.002~0.006	0.024~0.091
			21.52-C25	●		●	●	●		●		●	●	●	●			●	●	●	●		●					0.003~0.008	0.031~0.091
			2.522-C25									●																0.003~0.010	0.031~0.091
			32.51-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.003~0.010	0.031~0.118
			32.52-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.004~0.012	0.039~0.118
			431-C25							●		●	●	●	●			●	●	●	●		●					0.004~0.013	0.031~0.118
			432-C25	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●		●					0.005~0.014	0.047~0.138
			433-C25							●		●	●		●				●									0.006~0.016	0.055~0.138

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B123,164	SCLCR/L	B123,144,151,164

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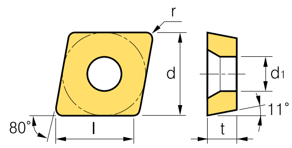


Dimensions(inch)			
Size	d	t	d1
2.5	5/16	3/32	9/64
32	3/8	1/8	11/64

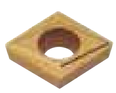
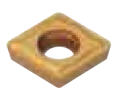
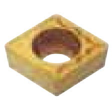
Rhombic 80° Positive

Relief Angle : 11°

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Machining types

● Continuous cutting
◆ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet: CN1500	CN2000	CN2500	Coated: CC1500	CC2500	Coated: NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	Uncoated: H01	H05	Cutting Condition: fn (ipr)	ap (inch)
Finishing 	CPGT 2.5150.5																									0.002~0.008	0.004~0.079
	2.51.51	●	●																							0.003~0.008	0.012~0.079
	2.51.52																									0.004~0.010	0.020~0.079
	320.5																									0.002~0.008	0.012~0.059
	321	●	●																							0.002~0.010	0.020~0.079
	322																									0.003~0.012	0.292~0.098
Finishing C05 	CPGT 2.51.51-C05																									0.001~0.006	0.020~0.067
	2.51.52-C05																									0.002~0.007	0.020~0.067
	321-C05																									0.001~0.008	0.028~0.079
	322-C05																									0.002~0.008	0.028~0.079
Medium to finishing HMP 	CPGT 322-HMP																									0.002~0.008	0.028~0.079
Finishing VF 	CPMT 2.51.51-VF																									0.002~0.008	0.012~0.047
	2.51.52-VF																									0.004~0.008	0.012~0.047
	321-VF												●													0.002~0.008	0.012~0.059
	322-VF												●													0.004~0.008	0.012~0.059

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

●: Stock item

Available tool holders			
Designation	Page	Designation	Page
SCLPR/L	B144, B152		

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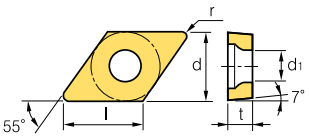


Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Rhombic **55° Positive**
Relief Angle : 7°

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ⧓ ● ● ⧓ ⧓ ● ● ⧓ ✱ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓	
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ⧓ ● ⧓	
Hardened steel	H	⧓ ✱ ● ⧓	

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF	DCET	21.5MFR-KF																								~0.002	0.002~0.051
			21.50MFR-KF																				●				0.001~0.003	0.002~0.059
			21.50.5MFR-KF																				●				0.001~0.004	0.002~0.067
			32.5MFR-KF																								0.001~0.003	0.002~0.059
			32.50MFR-KF																				●				0.001~0.004	0.002~0.067
			32.50.5MFR-KF																				●				0.002~0.006	0.003~0.079
			21.5MFL-KF																								~0.002	0.002~0.051
			21.50MFL-KF																				●				0.001~0.003	0.002~0.059
			21.50.5MFL-KF																								0.001~0.004	0.002~0.067
			32.5MFL-KF																								0.001~0.003	0.002~0.059
			32.50MFL-KF																								0.001~0.004	0.002~0.067
			32.50.5MFL-KF																								0.002~0.006	0.003~0.079
Medium to finishing (High precision)	KM	DCET	21.5MFR-KM																								~0.002	0.002~0.051
			21.50MFR-KM																				●				0.001~0.003	0.002~0.059
			21.50.5MFR-KM																				●				0.001~0.004	0.002~0.067
			32.5MFR-KM																								0.001~0.003	0.002~0.059
			32.50MFR-KM																				●				0.001~0.004	0.002~0.067
			32.50.5MFR-KM																				●				0.002~0.006	0.003~0.079
			21.5MFL-KM																								~0.002	0.002~0.051
			21.50MFL-KM																								0.001~0.003	0.002~0.059
			21.50.5MFL-KM																								0.001~0.004	0.002~0.067
			32.5MFL-KM																								0.001~0.003	0.002~0.059
			32.50MFL-KM																								0.001~0.004	0.002~0.067
			32.50.5MFL-KM																								0.002~0.006	0.003~0.079
Finishing	C05	DCGT	21.50.5-C05																								0.002~0.004	0.002~0.059
			21.51-C05																								0.002~0.007	0.003~0.059
			32.50.5-C05																								0.002~0.006	0.003~0.079
			32.51-C05																								0.002~0.009	0.004~0.079
			32.52-C05																								0.003~0.012	0.008~0.079
Finishing	HFP	DCGT	21.50.5-HFP																								0.001~0.004	0.002~0.039
			21.51-HFP																								0.002~0.005	0.003~0.039
			21.52-HFP																								0.002~0.005	0.004~0.039
			32.50-HFP																								0.001~0.005	0.002~0.039
			32.50.5-HFP																								0.002~0.006	0.003~0.059
			32.51-HFP																								0.002~0.008	0.004~0.059
			32.52-HFP																								0.003~0.010	0.008~0.059

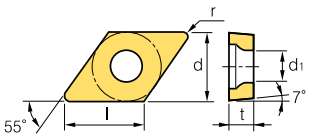
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B123	SDQCR/L	B145
SDJCR/L	B124, 164	SDUCR/L	B145
SDNCN	B124, 165	SDZCR/L	B146

DC○○

Rhombic 55° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece		
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱ ⬌ ✱
Stainless steel	M	⬌ ✱ ✱ ⬌ ⬌ ⬌ ● ⬌ ⬌ ✱ ● ⬌ ⬌
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ● ⬌ ⬌ ● ⬌
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

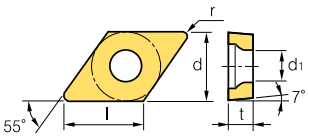
Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	KF	DCGT	21.5R-KF																								~0.002	0.002~0.051
			21.50R-KF																								0.001~0.003	0.002~0.059
			21.50.5R-KF																								0.001~0.004	0.002~0.059
			32.5R-KF																								0.001~0.003	0.002~0.059
			32.50R-KF																								0.001~0.004	0.002~0.067
			32.50.5R-KF																					●			0.002~0.006	0.003~0.079
			21.5L-KF																								~0.002	0.002~0.051
			21.50L-KF																								0.001~0.003	0.002~0.059
			21.50.5L-KF																								0.001~0.004	0.002~0.059
			32.5L-KF																								0.001~0.003	0.002~0.059
			32.50L-KF																								0.001~0.004	0.002~0.067
			32.50.5L-KF																								0.002~0.006	0.003~0.079
Finishing	VP1	DCGT	21.50-VP1																	●			●			●		0.001~0.002	0.002~0.039
			21.50.5-VP1																	●		●	●	●		●		0.001~0.004	0.003~0.059
			21.51-VP1																	●		●	●					0.002~0.005	0.004~0.059
			32.50-VP1																	●			●					0.001~0.005	0.002~0.039
			32.50.5-VP1																	●			●					0.002~0.006	0.003~0.059
			32.51-VP1																	●		●	●	●		●		0.002~0.008	0.004~0.059
Finishing (High precision)	VP1 New	DCGT	21.50MFN-VP1																				●					0.002~0.003	0.002~0.039
			21.50.5MFN-VP1																				●					0.002~0.004	0.003~0.059
			21.51MFN-VP1																				●					0.002~0.005	0.004~0.059
			32.50MFN-VP1																				●					0.002~0.005	0.002~0.039
			32.50.5MFN-VP1																				●					0.002~0.006	0.003~0.059
			32.51MFN-VP1																				●					0.005~0.008	0.004~0.059
Medium to finishing	KM	DCGT	21.5R-KM																									~0.002	0.002~0.051
			21.50R-KM																									0.001~0.003	0.002~0.059
			21.50.5R-KM																									0.001~0.004	0.002~0.059
			32.5R-KM																									0.001~0.003	0.002~0.059
			32.50R-KM																									0.001~0.004	0.002~0.067
			32.50.5R-KM																									0.002~0.006	0.003~0.079
			21.5L-KR																									~0.002	0.002~0.051
			21.50L-KF																									0.001~0.003	0.002~0.059
			21.50.5L-KF																									0.001~0.004	0.002~0.059
			32.5L-KF																									0.001~0.003	0.002~0.059
			32.50L-KF																									0.001~0.004	0.002~0.067
			32.50.5L-KF																									0.002~0.006	0.003~0.079

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B123	SDQCR/L	B145
SDJCR/L	B124, 164	SDUCR/L	B145
SDNCN	B124, 165	SDZCR/L	B146

DC○○



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Rhombic 55° Positive
Relief Angle : 7°

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ✱ ● ● ⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ✱ ✱ ● ● ⧓ ● ⧓
Hardened steel	H	✱ ✱ ● ⧓

Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	HFP	DCMT	21.50.5-HFP																								0.001~0.004	0.002~0.039
			21.51-HFP																								0.002~0.005	0.003~0.039
			21.52-HFP																								0.002~0.005	0.004~0.039
			32.50-HFP																								0.001~0.005	0.002~0.039
			32.50.5-HFP																								0.002~0.006	0.003~0.059
			32.51-HFP																								0.002~0.008	0.004~0.059
			32.52-HFP																								0.003~0.010	0.008~0.059
Finishing	VL	DCMT	21.51-VL	●		●	●	●		●			●		●					●	●	●	●	●		●	●	0.002~0.004	0.003~0.036
			32.51-VL	●		●	●	●	●	●			●		●					●	●		●				●	0.002~0.004	0.004~0.039
			32.52-VL	●		●	●	●		●			●		●					●	●	●	●	●			●	0.003~0.006	0.004~0.039
Finishing	VF	DCMT	21.50.5-VF			●			●				●										●					0.001~0.004	0.002~0.040
			21.51-VF		●	●			●			●	●					●		●			●					0.002~0.008	0.012~0.047
			32.50.5-VF	●					●			●	●															0.002~0.006	0.003~0.059
			32.51-VF	●	●	●						●	●					●		●			●					0.002~0.008	0.012~0.059
			32.52-VF	●		●														●			●					0.004~0.010	0.012~0.059
Medium to finishing	HMP	DCMT	21.50.5-HMP	●		●						●		●										●				0.001~0.005	0.004~0.059
			21.51-HMP	●	●	●			●		●	●		●	●			●		●			●	●				0.002~0.007	0.008~0.091
			21.52-HMP								●	●		●	●													0.003~0.009	0.016~0.091
			32.50.5-HMP									●		●	●								●	●				0.002~0.009	0.004~0.079
			32.51-HMP	●	●	●			●		●	●	●	●	●	●		●		●			●	●				0.003~0.009	0.012~0.118
			32.52-HMP	●		●			●		●	●		●	●			●		●			●	●				0.004~0.012	0.020~0.118
Medium	MP (New)	DCMT	21.50.5-MP	●		●	●	●		●			●		●					●	●		●	●				0.002~0.005	0.005~0.071
			21.51-MP	●		●	●	●		●			●		●					●	●	●	●	●				0.002~0.006	0.012~0.071
			21.52-MP	●		●	●	●		●			●		●					●	●		●	●				0.003~0.009	0.012~0.071
			32.50.5-MP	●		●	●	●	●	●			●		●					●	●		●	●				0.002~0.006	0.012~0.078
			32.51-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.002~0.008	0.020~0.091
			32.52-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.003~0.012	0.020~0.091
Medium	C25	DCMT	21.50.5-C25	●	●	●	●	●		●			●		●					●	●		●					0.001~0.006	0.012~0.079
			21.51-C25	●	●	●	●	●		●		●	●	●	●				●	●	●		●		●			0.002~0.008	0.020~0.098
			21.52-C25	●		●	●	●		●		●	●	●	●				●	●	●		●					0.002~0.010	0.031~0.098
			32.50.5-C25	●	●	●	●	●		●			●		●					●	●		●					0.002~0.010	0.020~0.098
			32.51-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.003~0.012	0.031~0.118
			32.52-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.004~0.012	0.039~0.118

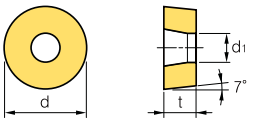
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B123	SDQCR/L	B145
SDJCR/L	B124, 164	SDUCR/L	B145
SDNCN	B124, 165	SDZCR/L	B146

RC○○

Round R° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
10	0.394	1/8	9/64
12	0.472	3/16	11/67
16	0.630	1/4	13/64
20	0.787	1/4	25/97
25	0.984	5/16	9/32
32	1.260	3/8	3/8

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05
Steel	P		●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱												
Stainless steel	M												⧓	⧓	●	⧓				⧓	✱		●	⧓		
Cast iron	K		●	⧓	✱	●	⧓							⧓			●	⧓	⧓						●	⧓
Non-ferrous metal	N																								●	⧓
Heat resistant alloy, Titanium alloy	S													⧓						⧓	✱	●	●	⧓	●	⧓
Hardened steel	H																						⧓	✱	●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

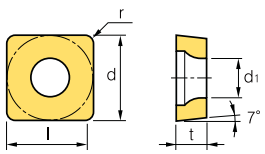
Inserts	Designation		Cermet			Coated		Coated																	Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium		RCMX 1003M0									●		●	●													0.010~0.020	0.059~0.157
		1204M0								●	●		●	●				●									0.012~0.024	0.098~0.197
		1606M0									●		●	●				●									0.016~0.028	0.118~0.276
		2006M0											●					●									0.019~0.035	0.138~0.354
		2507M0											●														0.022~0.047	0.157~0.472
		3209M0											●														0.026~0.059	0.197~0.591

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
PRDCN	B107	**PRGCR/L**	B107

SC○○

Square 90° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05
Steel	P		●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱												
Stainless steel	M												⧓	⧓	●	⧓				⧓	✱		●	⧓		
Cast iron	K		●	⧓	✱	●	⧓							⧓			●	⧓	⧓						●	⧓
Non-ferrous metal	N																								●	⧓
Heat resistant alloy, Titanium alloy	S													⧓						⧓	✱	●	●		●	⧓
Hardened steel	H																						⧓		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

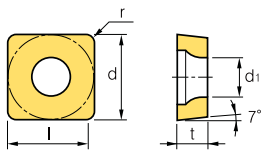
Inserts	Designation		Cermet			Coated		Coated																	Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	C05 	SCGT 32.51-C05																									0.004~0.009	0.004~0.079
		32.52-C05																									0.003~0.012	0.008~0.079
		432-C05																									0.003~0.013	0.008~0.079

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B125	**SSKCR/L**	B126,160
SSDCN	B125	**SSSCR/L**	B126,160

SC○○

Square 90° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	11/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ● ⧓ ⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ✱ ● ⧓ ● ⧓
Hardened steel	H	✱ ⧓ ● ⧓

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	HFP	SCGT	32.51-HFP																							0.002~0.010	0.004~0.059
Finishing	HFP	SCMT	32.51-HFP																							0.002~0.010	0.004~0.059
Finishing	VF	SCMT	32.51-VF										●							●			●			0.002~0.008	0.012~0.059
Finishing	VL	SCMT	09T304-VL	●		●	●	●	●	●			●		●					●	●	●	●	●			0.002~0.004	0.004~0.039
			09T308-VL	●		●	●	●		●			●		●					●	●	●	●	●			0.003~0.006	0.004~0.039
Medium to finishing	HMP	SCMT	32.51-HMP	●							●	●		●						●				●			0.003~0.009	0.012~0.118
			32.52-HMP	●					●		●	●		●	●					●				●			0.004~0.012	0.020~0.118
			431-HMP																								0.004~0.011	0.012~0.142
			432-HMP									●		●				●									0.005~0.014	0.024~0.142
Medium to finishing	MP	SCMT	32.51-MP							●			●									●	●				0.002~0.010	0.012~0.110
			32.52-MP							●			●		●							●	●				0.004~0.012	0.020~0.110
			431-MP																			●	●				0.006~0.014	0.032~0.138
Medium	C25	SCMT	21.51-C25											●													0.003~0.010	0.016~0.098
			32.51-C25	●	●	●	●	●		●		●	●	●	●			●	●	●	●		●				0.003~0.010	0.024~0.118
			32.52-C25	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●		●				0.004~0.012	0.039~0.118
			431-C25	●		●	●	●		●		●	●		●				●	●	●		●		●			0.004~0.012	0.031~0.150
			432-C25	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●		●		●			0.005~0.015	0.047~0.150

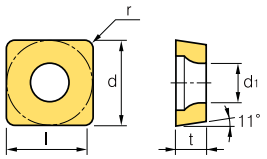
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B125	SSKCR/L	B126, 160
SSDCN	B125	SSSCR/L	B126, 160

SP○○

Square 90° Positive
Relief Angle : 11°

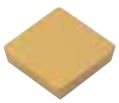


Dimensions(inch)			
Size	d	t	d1
2.5	5/16	3/32	-
21.5	1/4	3/32	7/64
32	3/8	1/8	11/64
42	1/2	1/8	-

Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	-
53	5/8	3/16	-
63	3/4	3/16	-

Workpiece		
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱
Stainless steel	M	⬌ ✱ ⬌ ⬌ ● ⬌ ✱ ✱ ⬌ ⬌ ✱ ✱ ● ⬌
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ● ⬌ ⬌
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

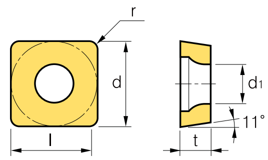
Inserts		Designation		Cermet			Coated		Coated																		Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	ST30A	fn (ipr)	ap (inch)
Medium to finishing		SPGA	21.51																									0.002~0.010	0.020~0.079
			322T	●	●																							0.004~0.010	0.028~0.118
			322T-Z		●																							0.004~0.010	0.028~0.118
			(Z=Special Nega land)																										
Medium to finishing		SPGN	2.51.50.5																									0.001~0.004	0.020~0.079
			2.51.53																									0.004~0.010	0.028~0.118
			320.5																									0.001~0.004	0.020~0.118
			321																									0.003~0.008	0.028~0.138
			322																									0.004~0.010	0.028~0.138
			420.5																									0.001~0.008	0.020~0.118
			421																									0.003~0.008	0.039~0.197
			422											●													●	0.004~0.010	0.039~0.197
			423																									0.006~0.012	0.039~0.197
			424																									0.007~0.013	0.039~0.197
			430.5																									0.001~0.008	0.020~0.118
			431																									0.003~0.008	0.039~0.197
			432																									0.004~0.010	0.039~0.197
			433																									0.006~0.012	0.039~0.197
			434																									0.007~0.013	0.039~0.197
			437.5																									0.008~0.024	0.079~0.197
			4310																									0.010~0.028	0.118~0.197
			531																									0.003~0.008	0.059~0.276
			532																									0.004~0.010	0.059~0.276
			533																									0.006~0.012	0.059~0.276
			534																									0.007~0.013	0.059~0.276
			535																									0.008~0.018	0.059~0.276
			631																									0.003~0.008	0.059~0.354
			632																									0.004~0.010	0.059~0.354
			633																									0.006~0.018	0.059~0.354
			634																									0.007~0.024	0.059~0.354
			636																									0.010~0.028	0.098~0.354
Finishing	F 	SPGR	321-F																									0.004~0.010	0.012~0.079
			421-F																									0.006~0.010	0.020~0.079

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B114	SSKCR/L	B146
CSKPR/L	B115		

SP ◯◯

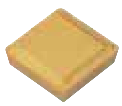
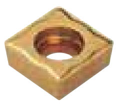
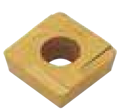
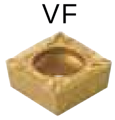
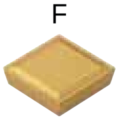
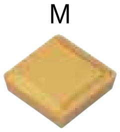
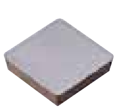


Dimensions(inch)			
Size	d	t	d1
32	3/8	1/8	11/64
42	1/2	1/8	-
53	5/8	3/16	-
63	3/4	3/16	-
84	1	1/4	-

Square **90° Positive**
Relief Angle : 11°

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	ST30A
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆				◆	✱		●	◆		
Cast iron	K	●	◆	✱	●	◆							◆			●	◆	◆						●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆						◆	✱	●	●	◆	●	◆
Hardened steel	H																					◆	✱	●	◆

Machining types
- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

Inserts	Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3010	Coated NC3215	Coated NC3120	Coated NC3220	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC9020	Coated NC9025	Coated NC6205	Coated NC6210	Coated NC6215	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Uncoated H01	Uncoated ST30A	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Medium M 	SPGR	322-M																									0.004~0.016	0.039~0.138
		422-M																									0.008~0.016	0.059~0.157
Finishing C05 	SPGT	321-C05																									0.004~0.009	0.004~0.059
		322-C05																									0.003~0.012	0.020~0.079
Medium to finishing 	SPGT	321R																									0.003~0.009	0.012~0.118
		322R																									0.004~0.012	0.020~0.118
		321L		●																							0.003~0.009	0.012~0.118
		322L																									0.004~0.012	0.020~0.118
Finishing VF 	SPMT	321-VF																									0.002~0.008	0.012~0.059
		322-VF																									0.004~0.010	0.012~0.059
Finishing F 	SPMR	321-F																									0.002~0.008	0.012~0.079
		421-F									●		●														0.004~0.010	0.020~0.079
Medium M 	SPMR	322-M									●		●														0.004~0.016	0.039~0.138
		422-M									●		●														0.004~0.016	0.059~0.157
		423-M											●														0.008~0.016	0.059~0.157
Medium to finishing 	SPUN	421																									0.004~0.012	0.039~0.197
		422									●															●	0.006~0.016	0.039~0.197
		533																									0.008~0.020	0.039~0.197
		633																								●	0.008~0.020	0.059~0.276
		634																									0.010~0.024	0.079~0.276
		845																									0.012~0.031	0.118~0.394
		422SN																									0.006~0.016	0.039~0.197

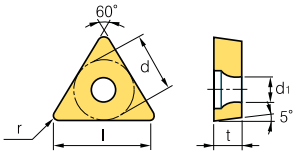
Cutting edge geometry **A38 ~ A43**　Recommended chip breaker **B04 ~ B11**　Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B114	SSKPR/L	B146
CSKPR/L	B115		

TB ○○

Triangular **60° Positive**
Relief Angle : 5°



Dimensions(inch)			
Size	d	t	d1
52	5/32	1/16	11/128

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱	● Continuous cutting
Stainless steel	M	⬌ ✱ ✱ ⬌ ⬌ ⬌ ● ⬌ ✱ ⬌ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ● ⬌ ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ● ● ⬌	
Hardened steel	H	⬌ ● ⬌	

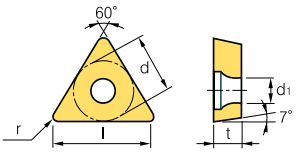
Inserts		Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		TBGT 520.5		●																			●	●		0.002~0.008	0.004~0.051
		521		●																						0.003~0.008	0.004~0.051

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STUBR	B148		

TC ○○

Triangular **60° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
73	7/32	3/32	13/128

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ● ⬌ ⬌ ⬌ ✱ ✱	
Stainless steel	M	⬌ ✱ ✱ ⬌ ⬌ ⬌ ● ⬌ ✱ ⬌ ● ⬌	
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ● ⬌ ⬌ ⬌ ● ⬌	
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ● ⬌ ● ⬌	
Hardened steel	H	⬌ ✱ ● ⬌	

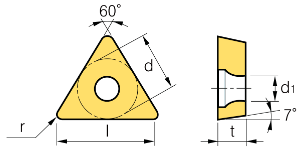
Inserts		Designation	Cermet			Coated		Coated																	Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Finishing	C05 	TCGT 731-C05																									0.002~0.008	0.004~0.067
		21.51-C05																									0.002~0.008	0.024~0.098
		21.52-C05																									0.003~0.009	0.004~0.067

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B126,165	**STTCR/L**	B127,161
STFCR/L	B126,160	**STWCR/L**	B161
STGCR/L	B127		

TC ◯◯

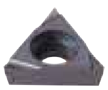
Triangular **60° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	**d**	**t**	**d1**
1.51	3/16	3/32	3/32
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	13/128

Workpiece		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Steel	P	●	◆	✱	●	◆	●	●	◆	◆	◆	✱	✱												
Stainless steel	M											◆	◆	●	◆			◆	✱		●	◆	◆		
Cast iron	K	●	◆	✱	●	◆							◆			◆	◆							●	◆
Non-ferrous metal	N																							●	◆
Heat resistant alloy, Titanium alloy	S												◆					◆	✱	●	●	◆		●	◆
Hardened steel	H																				◆	✱		●	◆

Machining types
- ● Continuous cutting
- ◆ General cutting
- ✱ Interrupted cutting

Inserts	Designation		Cermet			Coated		Coated																		Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing HFP 	TCGT	731-HFP																									0.002~0.007	0.005~0.059
		21.50.5-HFP																									0.001~0.005	0.004~0.047
		21.51-HFP																									0.002~0.007	0.006~0.059
		32.51-HFP																									0.002~0.010	0.004~0.059
Finishing KF 	TCGT	1.51.5R-KF																									~0.002	0.002~0.051
		1.51.50R-KF																									0.001~0.003	0.002~0.059
		1.51.50.5R-KF																									0.001~0.004	0.002~0.067
		1.51.5L-KF																									~0.002	0.002~0.051
		1.51.50L-KF																									0.001~0.003	0.002~0.059
		1.51.50.5L-KF																									0.001~0.004	0.002~0.067
Finishing HFP 	TCMT	731-HFP																									0.002~0.007	0.004~0.059
		21.50.5-HFP																									0.001~0.005	0.004~0.047
		21.51-HFP																									0.002~0.007	0.004~0.059
		32.50.5-HFP																									0.001~0.005	0.004~0.059
		32.51-HFP																									0.003~0.010	0.008~0.059
Finishing VF 	TCMT	21.50.5-VF																									0.001~0.005	0.002~0.028
		21.51-VF		●															●			●					0.002~0.008	0.012~0.047
		21.52-VF																	●			●					0.004~0.010	0.012~0.047
		32.50.5-VF																									0.002~0.006	0.004~0.051
		32.51-VF						●			●	●		●			●		●			●					0.002~0.006	0.012~0.059
Finishing (Mild steel) VL 	TCMT	21.51-VL																									0.002~0.006	0.004~0.051
		21.52-VL																									0.003~0.008	0.004~0.051
		32.51-VL	●		●	●	●	●	●			●							●	●	●	●	●				0.002~0.006	0.012~0.059
		32.52-VL	●		●	●	●		●			●		●					●	●	●	●	●				0.002~0.006	0.012~0.059
Medium to finishing HMP 	TCMT	731-HMP																	●								0.002~0.007	0.008~0.091
		732-HMP																	●								0.003~0.009	0.016~0.091
		21.50.5-HMP																	●								0.001~0.006	0.004~0.059
		21.51-HMP		●				●			●		●	●					●					●			0.002~0.007	0.008~0.098
		21.52-HMP									●		●	●					●					●			0.004~0.010	0.016~0.098
		32.51-HMP		●				●		●	●		●	●			●		●			●		●			0.003~0.009	0.012~0.118
		32.52-HMP						●		●	●		●	●			●		●					●			0.004~0.012	0.020~0.138
Medium MP 	TCMT	21.50.5-MP							●			●		●								●					0.001~0.005	0.008~0.059
		21.51-MP							●			●		●								●					0.002~0.006	0.008~0.059
		21.52-MP							●			●		●								●					0.004~0.011	0.010~0.078
		32.51-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.003~0.008	0.012~0.098
		32.52-MP	●		●	●	●	●	●			●		●					●	●	●	●	●				0.004~0.012	0.020~0.098
		32.53-MP							●			●		●							●	●	●				0.008~0.016	0.020~0.098

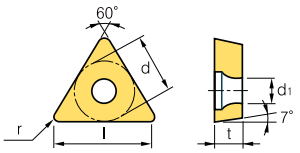
Cutting edge geometry **A38 ~ A43**   Recommended chip breaker **B04 ~ B11**   Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	**Page**	**Designation**	**Page**
STACR/L	B126,165	**STTCR/L**	B127,161
STFCR/L	B126,160	**STWCR/L**	B161
STGCR/L	B127		

TC○○

Triangular 60° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	3/8	3/32~5/32	13/128

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ⬌ ● ⬌ ⬌ ✱ ✱	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ● ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ●	
Hardened steel	H	● ⬌	

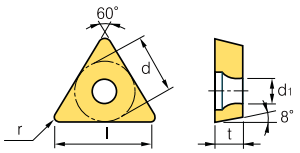
Inserts		Designation	Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	C25 	TCMT 731-C25	●		●	●	●	●	●		●	●	●	●				●	●	●	●		●			0.002~0.007	0.016~0.098
		732-C25	●		●	●	●		●		●	●		●				●	●	●	●		●			0.003~0.010	0.031~0.098
		21.50.5-C25	●		●	●	●		●		●	●		●						●	●		●			0.002~0.005	0.016~0.079
		21.51-C25	●	●	●	●	●	●	●		●	●	●	●				●	●	●	●		●			0.002~0.008	0.024~0.098
		21.52-C25	●		●	●	●		●		●	●	●	●				●	●	●	●		●	●		0.003~0.010	0.031~0.098
		32.51-C25	●		●	●	●	●	●	●	●	●	●	●				●	●	●	●		●	●		0.003~0.011	0.031~0.118
		32.52-C25	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●		●	●		0.004~0.012	0.039~0.118

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B126,165	STTCR/L	B127,161
STFCR/L	B126,160	STWCR/L	B161
STGCR/L	B127		

TO○○

Triangular 60° Positive
Relief Angle : 8°



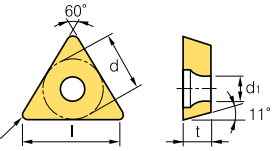
Dimensions(inch)			
Size	d	t	d1
2.52	10/31	15/128	5/32
52	5/32	1/16	11/128
73	7/32	3/32	7/64

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ⬌ ● ⬌ ⬌ ✱ ✱	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ● ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ●	
Hardened steel	H	● ⬌	

Inserts		Designation	Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	ST10	G10	fn (ipr)	ap (inch)
Medium to finishing		TOEH 520.5L																								0.002~0.007	0.004~0.059
		731L																							●		0.002~0.008	0.012~0.098
		2.521L		●																						●	0.002~0.010	0.012~0.098

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

TP ○○



Triangular **60° Positive**
Relief Angle : 11°

Dimensions(inch)			
Size	d	t	d1
22	1/4	3/32~1/8	9/64
32	3/8	1/8	-
33	3/8	3/16	-
43	1/2	3/16	-

Dimensions(inch)			
Size	d	t	d1
53	5/8	3/16	-
54	5/8	1/4	-
63	3/16	3/32	3/32
73	7/32	3/32	-

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ⧓ ⧓ ✱ ⧓ ● ⧓ ✱ ✱ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ● ● ⧓ ✱ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

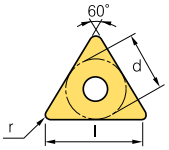
Inserts		Designation		Cermet			Coated		Coated														Uncoated				Cutting Condition	
				CN30	CN1500	CN2000	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC9030	NC6210	NC6215	PC8105	PC8110	PC8115	ST10	G10	H01	H05	fn (ipr)	ap (inch)
Finishing		TPGH	630.5L			●																					0.001~0.005	0.002~0.067
			631L		●	●																					0.001~0.006	0.003~0.067
			230.5L																								0.002~0.006	0.002~0.079
			231L																								0.003~0.008	0.003~0.118
Medium to finishing		TPGN	731																								0.003~0.008	0.028~0.079
			220.5																								0.002~0.006	0.020~0.079
			221											●									●		●		0.003~0.008	0.028~0.118
			222											●											●		0.004~0.010	0.039~0.118
			320.5																								0.002~0.007	0.039~0.197
			321	●										●									●	●	●		0.003~0.008	0.039~0.197
			322											●										●	●		0.004~0.010	0.039~0.197
			322.5																								0.004~0.010	0.039~0.197
			323											●													0.006~0.012	0.039~0.197
			324											●													0.006~0.012	0.039~0.197
			331																								0.003~0.008	0.039~0.197
			431											●									●	●			0.003~0.008	0.059~0.276
			432											●													0.004~0.010	0.059~0.276
			433											●													0.006~0.012	0.059~0.276
			437.5																								0.012~0.018	0.059~0.276
			4310																								0.012~0.020	0.059~0.276
			532																								0.006~0.010	0.118~0.315
			542																								0.006~0.010	0.118~0.315
Finishing	F 	TPGR	220.5-F																								0.002~0.006	0.004~0.059
			221-F																								0.002~0.008	0.012~0.098
			321-F																								0.003~0.010	0.012~0.098
Medium	M 	TPGR	222-M																								0.005~0.012	0.039~0.118
			322-M																								0.005~0.012	0.039~0.197

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B147	STUPR/L	B150
CTFPR/L	B115	CTGPR/L	B115

TP○○

Triangular **60° Positive**
Relief Angle : 11°



Dimensions(inch)			
Size	d	t	d1
1.5	3/16	3/32	3/32
22	1/4	1/8	9/64
32	3/8	1/8	11/64

Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	11/64
63	3/16	3/32	3/32
73	7/32	3/32	0.118

Workpiece																									
Steel	P	●	⬌	✱	●	⬌	●	●	⬌	⬌	⬌	✱	✱												
Stainless steel	M											⬌	⬌	●	⬌				⬌	✱		●	⬌		
Cast iron	K	●	⬌	✱	●	⬌							⬌			●	⬌	⬌						●	⬌
Non-ferrous metal	N																							●	⬌
Heat resistant alloy, Titanium alloy	S												⬌						⬌	✱	●	●	⬌	●	⬌
Hardened steel	H																					⬌	✱	●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

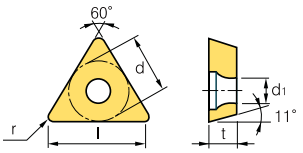
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	C05	TPGT	221-C05		●																						0.002~0.012	0.020~0.079
			331-C05																								0.002~0.012	0.031~0.079
Finishing	HFP	TPGT	221-HFP																								0.002~0.010	0.008~0.059
			322-HFP																								0.002~0.010	0.012~0.098
Medium to finishing		TPGT	630.5R																								0.002~0.008	0.012~0.059
			220.5R																								0.002~0.008	0.012~0.059
			221R		●																						0.002~0.008	0.020~0.079
			222R																								0.003~0.010	0.020~0.079
			331R		●																						0.002~0.008	0.028~0.118
			332R																								0.002~0.008	0.028~0.118
			1.51.50.5L		●																		●		●		0.002~0.008	0.012~0.059
			220.5L																								0.002~0.008	0.012~0.059
			221L	●	●																						0.002~0.008	0.020~0.079
			222L																								0.003~0.010	0.020~0.079
			331L		●																						0.002~0.008	0.028~0.118
			332L																								0.002~0.008	0.028~0.118
Medium to finishing		TPGX	730.5L																								0.004~0.008	0.012~0.039
			731L			●																					0.004~0.010	0.020~0.039
			732L																								0.004~0.012	0.039~0.039
			221L																								0.004~0.010	0.020~0.047
Finishing	F	TPMR	730.5-F																								0.002~0.006	0.004~0.039
			731-F																								0.002~0.006	0.004~0.039
			220.5-F																								0.002~0.006	0.004~0.059
			221-F						●		●	●		●				●						●			0.002~0.008	0.012~0.059
			222-F																								0.002~0.010	0.012~0.059
			321-F						●		●	●		●	●							●		●			0.003~0.010	0.020~0.079
			322-F																								0.003~0.010	0.020~0.118

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B147	STUPR/L	B150
CTFPR/L	B115	CTGPR/L	B115

TP ○○

Triangular **60° Positive**
Relief Angle : 11°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	-
22	1/4	1/8	9/64
32	3/8	1/8	-
33	3/8	3/16	11/64

Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	-
64	3/4	1/4	-
73	7/32	1/8	-

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓	● Continuous cutting
Stainless steel	M	⧓ ✱ ● ⧓ ✱ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ● ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ✱ ● ● ⧓ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

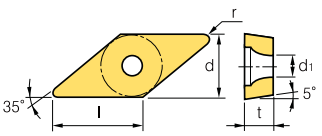
Inserts		Designation		Cermet			Coated			Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NCM325	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	ST30A	G10	fn (ipr)	ap (inch)
Medium	M	TPMR	221-M							●			●		●													0.004~0.010	0.028~0.118
			222-M																									0.005~0.012	0.039~0.118
			321-M												●													0.004~0.010	0.039~0.197
			322-M									●	●		●													0.005~0.012	0.039~0.197
			323-M												●													0.006~0.014	0.039~0.197
			432-M										●															0.005~0.012	0.059~0.276
Medium to finishing		TPUN	732																									0.004~0.012	0.020~0.079
			21.52																									0.006~0.016	0.039~0.118
			221																									0.004~0.012	0.039~0.118
			222																									0.006~0.016	0.039~0.118
			321												●											●	●	0.004~0.012	0.039~0.197
			322						●						●											●		0.006~0.016	0.039~0.197
			323												●													0.008~0.020	0.059~0.197
			431																									0.004~0.012	0.059~0.276
			432												●											●		0.006~0.016	0.059~0.276
			433																									0.008~0.020	0.059~0.276
			645																									0.012~0.028	0.118~0.394
			322TN																									0.006~0.016	0.039~0.197
			323TN																									0.008~0.020	0.059~0.197
			433TN																									0.008~0.020	0.059~0.276
Finishing	VL	TPMT	221-VL	●		●	●	●			●			●		●					●	●	●	●	●				0.002~0.006	0.004~0.051
Finishing	VF	TPMT	221-VF		●					●		●	●	●		●					●			●					0.002~0.008	0.012~0.059
			222-VF							●			●	●		●								●					0.004~0.010	0.012~0.059
			331-VF																										0.002~0.008	0.012~0.079
			332-VF																										0.004~0.010	0.012~0.079
Medium to finishing	MP New	TPMT	221-MP	●		●	●	●													●	●							0.002~0.008	0.008~0.059

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B147	STUPR/L	B150
CTFPR/L	B115	CTGPR/L	B115

VB○○

Rhombic 35° Positive
Relief Angle : 5°



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	7/64~1/9
33	3/8	3/16	11/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬣ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

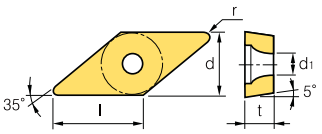
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	HFP	VBGT	220-HFP																								0.003~0.008	0.020~0.059
			332-HFP																								0.006~0.010	0.028~0.079
Finishing	KF	VBGT	22R-KF																								~0.002	0.002~0.051
			220R-KF																								0.001~0.003	0.002~0.059
			220.5R-KF																					●			0.001~0.005	0.002~0.067
			22L-KF																								~0.002	0.002~0.051
			220L-KF																								0.001~0.003	0.002~0.059
			220.5L-KF																								0.001~0.005	0.002~0.067
Medium to finishing		VBGT	331																								0.003~0.008	0.020~0.059
			332																								0.006~0.010	0.028~0.079
Medium to finishing	KM	VBGT	22R-KM																								~0.002	0.002~0.051
			220R-KM																								0.001~0.003	0.002~0.059
			220.5R-KM																								0.001~0.005	0.002~0.067
			22L-KM																								~0.002	0.002~0.051
			220L-KM																								0.001~0.003	0.002~0.059
			220.5L-KM																								0.001~0.005	0.002~0.067
Finishing	MP New	VBMT	331-MP	●		●	●		●	●			●		●					●	●	●	●	●			0.002~0.008	0.012~0.078
			332-MP	●		●	●	●	●	●			●		●					●	●	●	●	●			0.004~0.010	0.020~0.091
			333-MP	●		●				●			●		●					●	●	●	●	●			0.004~0.014	0.020~0.091

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B127	SVVBN	B129
SVHBR/L	B128	SVQBR/L	B148
SVJBR/L	B128,165	SVUBR/L	B149

VB○○



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
22	1/4	1/8	9/64
33	3/8	1/8~3/16	11/64

Rhombic **35° Positive**
Relief Angle : 5°

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ● ⧓ ⧓ ⧓ ✱ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ⧓ ✱ ● ● ⧓ ⧓ ● ⧓ ⧓ ✱ ● ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ● ⧓	
Heat resistant alloy, Titanium alloy	S	⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ⧓ ✱ ● ⧓	
Hardened steel	H	⧓ ✱ ● ⧓	

Inserts	Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VB	VBMT 331-VB	●		●							●															0.002~0.008	0.008~0.059
		VBMT 332-VB	●		●							●															0.004~0.009	0.020~0.059
Finishing	VF	VBMT 331-VF	●	●	●			●				●	●						●			●					0.002~0.008	0.012~0.040
		VBMT 332-VF	●	●	●														●								0.004~0.010	0.012~0.040
Finishing (Mild steel)	VL	VBMT 331-VL	●	●	●	●	●	●	●			●		●					●	●	●	●	●				0.002~0.008	0.012~0.059
		VBMT 332-VL	●		●	●	●		●			●		●					●	●	●	●	●				0.004~0.008	0.012~0.059
		VBMT 333-VL																				●	●				0.004~0.010	0.012~0.059
Medium to finishing		VBMT 331		●				●		●	●		●				●							●			0.003~0.008	0.020~0.059
		VBMT 332		●				●		●	●		●				●							●			0.006~0.010	0.028~0.079
Medium to finishing	HMP	VBMT 21.51-HMP									●																0.001~0.008	0.006~0.098
		21.52-HMP																									0.001~0.010	0.006~0.098
		221-HMP								●	●																0.001~0.008	0.006~0.106
		222-HMP								●	●																0.002~0.010	0.016~0.106
		331-HMP						●		●	●		●	●	●		●	●		●		●					0.003~0.008	0.008~0.106
		332-HMP						●		●	●		●	●			●	●	●	●		●		●			0.004~0.011	0.020~0.106
		333-HMP																									0.004~0.013	0.020~0.106

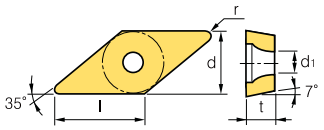
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B127	SVVBN	B129
SVHBR/L	B128	SVQBR/L	B148
SVJBR/L	B128,165	SVUBR/L	B149

VC○○

Rhombic 35° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	9/64~7/64
33	3/8	3/16	11/64

Workpiece			Machining types
Steel	P	● ⬣ ✱ ● ⬣ ● ● ⬣ ⬣ ⬣ ✱ ✱	● Continuous cutting
Stainless steel	M	⬣ ⬣ ✱ ⬣ ⬣ ✱ ⬣ ⬣ ● ⬣ ⬣ ⬣ ✱ ● ⬣ ⬣	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ⬣ ✱ ● ⬣ ⬣ ⬣ ⬣ ● ⬣	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣	
Heat resistant alloy, Titanium alloy	S	⬣ ✱ ● ● ⬣ ● ⬣	
Hardened steel	H	⬣ ✱ ● ⬣	

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF	VCET	22MFR-KF																				●				0.001~0.002	0.002~0.051
			220MFR-KF																				●				0.001~0.003	0.002~0.059
			220.5MFR-KF																				●				0.001~0.005	0.002~0.067
			22MFL-KF																								0.001~0.002	0.002~0.051
			220MFL-KF																								0.001~0.003	0.002~0.059
			220.5MFL-KF																								0.001~0.005	0.002~0.067
Medium to finishing (High precision)	KM	VCET	22MFR-KM																				●				0.001~0.002	0.002~0.051
			220MFR-KM																				●				0.001~0.003	0.002~0.059
			220.5MFR-KM																				●				0.001~0.005	0.002~0.067
			22MFL-KM																								0.001~0.002	0.002~0.051
			220MFL-KM																								0.001~0.003	0.002~0.059
			220.5MFL-KM																								0.001~0.005	0.002~0.067
Finishing	HFP	VCGT	220.5-HFP																								0.001~0.007	0.004~0.039
			221-HFP																								0.001~0.007	0.006~0.047
			222-HFP																								0.002~0.009	0.008~0.047
			331-HFP																								0.002~0.008	0.006~0.059
			332-HFP																								0.002~0.010	0.008~0.059
Finishing	VP1	VCGT	220-VP1																	●		●	●	●	●		●	0.001~0.006	0.002~0.006
			220.5-VP1																	●		●	●	●	●		●	0.001~0.007	0.004~0.039
			221-VP1																	●		●	●	●	●		●	0.001~0.007	0.006~0.047
Finishing (High precision)	VP1	VCGT	220MFN-VP1																				●					0.001~0.006	0.002~0.006
			220.5MFN-VP1																				●					0.001~0.007	0.004~0.039
			221MFN-VP1																				●					0.001~0.007	0.006~0.047
Finishing	KF	VCGT	22R-KF																									0.001 ~0.002	0.002~0.051
			220R-KF																									0.001~0.003	0.002~0.059
			220.5R-KF																						●			0.001~0.005	0.002~0.067
			22L-KF																									0.001~0.002	0.002~0.051
			220L-KF																									0.001~0.003	0.002~0.059
			220.5L-KF																									0.001~0.005	0.002~0.067

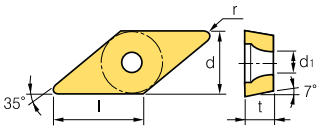
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B128,148,165	SVQCR/L	B148
SVVCN	B129	SVUCR/L	B144

VC○○

Rhombic **35° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
1.5	3/16	3/32	3/32
22	1/4	1/8	9/64~7/64
33	3/8	3/16	11/64

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05
	Steel	P	●	⧓	✱	●	⧓	●	●	⧓	⧓	⧓	✱	✱												
	Stainless steel	M											⧓	⧓	●	⧓						⧓	✱	●	⧓		
	Cast iron	K	●	⧓	✱	●	⧓							⧓			●	⧓	⧓						●	⧓
	Non-ferrous metal	N																							●	⧓
	Heat resistant alloy, Titanium alloy	S												⧓						⧓	✱	●	●	⧓	●	⧓
	Hardened steel	H																					⧓	✱	●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated																Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	KM	VCGT	22R-KM																								0.001~0.002	0.002~0.051
			220R-KM																								0.001~0.003	0.002~0.059
			220.5R-KM																					●			0.001~0.005	0.002~0.067
			22L-KM																								0.001~0.002	0.002~0.051
			220L-KM																								0.001~0.003	0.002~0.059
			220.5L-KM																								0.001~0.005	0.002~0.067
Finishing	HFP	VCMT	220.5-HFP																								0.001~0.007	0.004~0.039
			221-HFP																								0.001~0.007	0.006~0.047
			222-HFP																								0.002~0.009	0.008~0.047
			331-HFP																								0.002~0.008	0.006~0.059
			332-HFP																								0.002~0.010	0.008~0.059
Finishing	VF	VCMT	1.51.50.5-VF						●																		0.002~0.008	0.012~0.039
			1.51.51-VF												●												0.004~0.010	0.012~0.039
			221-VF						●			●	●														0.001~0.007	0.006~0.047
			331-VF						●				●		●									●			0.002~0.008	0.006~0.060
Finishing (Mild steel)	VL	VCMT	331-VL						●	●			●											●			0.002~0.008	0.012~0.059
			332-VL						●	●			●										●	●			0.002~0.008	0.012~0.059
			333-VL																								0.004~0.010	0.012~0.059
Medium to finishing	HMP	VCMT	331-HMP						●		●	●		●		●								●	●			0.002~0.008	0.012~0.106
			332-HMP								●	●		●										●	●			0.004~0.014	0.020~0.138
Medium to finishing	MP New	VCMT	331-MP							●			●											●				0.002~0.007	0.012~0.078
			332-MP							●			●										●	●				0.004~0.009	0.020~0.091
			333-MP																				●	●				0.004~0.013	0.020~0.091

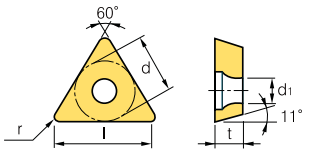
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B128,148,165	SVQCR/L	B148
SVVCN	B129	SVUCR/L	B144

VP○○

Triangular 60° Positive
Relief Angle : 11°



Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	7/64
63	3/16	3/32	6/64

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ⬌ ● ⬌ ✱ ✱	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ⬌ ⬌ ✱ ⬌ ● ⬌ ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ✱ ● ● ⬌ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF New	VPET	63013MFR-KF																								0.001~0.002	0.002~0.059
			630MFR-KF																				●				0.001~0.003	0.002~0.059
			630.5MFR-KF																				●				0.001~0.005	0.002~0.067
			63013MFL-KF																								0.001~0.002	0.002~0.059
			630MFL-KF																								0.001~0.003	0.002~0.059
			630.5MFL-KF																								0.001~0.005	0.002~0.067
Medium to finishing (High precision)	KM New	VPET	63013MFR-KM																								0.001~0.002	0.002~0.059
			630MFR-KM																				●				0.001~0.003	0.002~0.059
			630.5MFR-KM																				●				0.001~0.005	0.002~0.067
			63013MFL-KM																								0.001~0.002	0.002~0.059
			630MFL-KM																								0.001~0.003	0.002~0.059
			630.5MFL-KM																								0.001~0.005	0.002~0.067
Finishing	VP1	VPGT	220-VP1																		●		●	●	●	●	0.001~0.006	0.002~0.006
			220.5-VP1																		●		●	●	●	●	0.001~0.007	0.004~0.039
			221-VP1																		●		●	●	●	●	0.001~0.007	0.006~0.047
Finishing (High precision)	VP1 New	VPGT	220MFN-VP1																				●				0.001~0.006	0.002~0.006
			220.5MFN-VP1																				●				0.001~0.007	0.004~0.039
			221MFN-VP1																				●				0.001~0.007	0.006~0.047

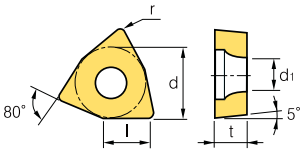
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B127	SVVBN	B128
SVJBR/L	B128, 165		

WB○○

Trigon **80° Positive**
Relief Angle : 5°



Dimensions(inch)			
Size	d	t	d1
52	5/32	1/6	11/128
63	3/16	3/32	3/32

Workpiece			Machining types
	Steel	P	
	Stainless steel	M	
	Cast iron	K	
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	WBGT **520.5R**																									~0.002	0.004~0.012
	631R																									~0.004	0.004~0.020
	520.5L		●																			●	●			~0.003	0.004~0.016
	630.5L																									~0.003	0.004~0.016
	631L																									~0.004	0.004~0.020

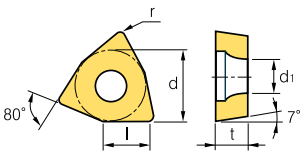
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SWUBR/L	B150		

WC○○

Trigon **80° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
43	1/2	3/16	0.217

Workpiece			Machining types
	Steel	P	
	Stainless steel	M	
	Cast iron	K	
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet			Coated		Coated																Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3010	NC3215	NC3120	NC3220	NC3225	NC3030	NC5330	NC9020	NC9025	NC6205	NC6210	NC6215	PC5300	PC5400	PC8105	PC8110	PC8115	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	WCGT **432-C05**																									0.003~0.012	0.008~0.106
	C05																										

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SWACR/L	B129	**SWLCR/L**	B149

Technical Information for Aluminum

AK special chip breaker for aluminum

▶ Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
▶ High rake angle at cutting edge part reduces cutting load to increase tool life.
▶ Buffed finish on top face controls chip flow reducing built-up edge

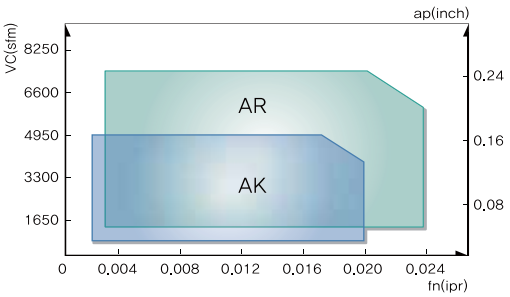
❶ High rake angle & tabby pattern chip pocket - Low cutting load
❷ Unique rake angle design - Effective chip breaking and good chip flow
❸ Unique and 3-dimensional top face - Longer tool life & Excellent surface roughness
❹ Tabby pattern & Sharp cutting edge - Distributing cutting load, long tool life
❺ Buffed on top face - Excellent machining, Reducing built-up edge, Excellent chip flow

AR special chip breaker for aluminum

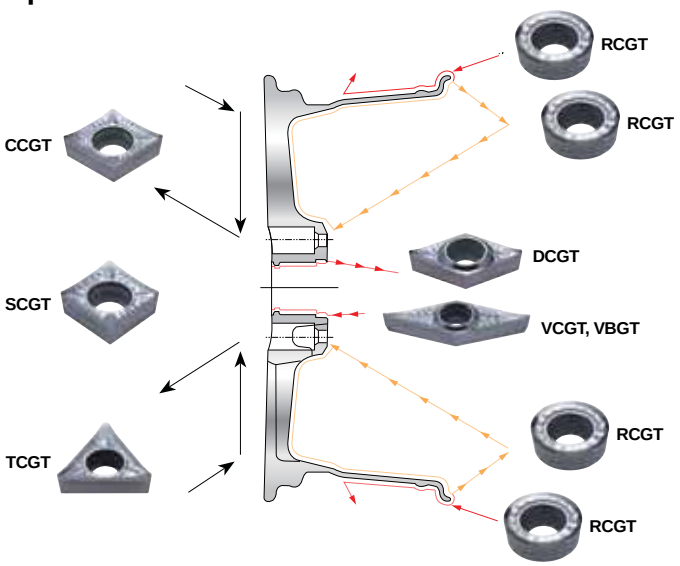
▶ AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining

❶ Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
❷ Specially buffed on top face controls chip flow reducing built-up edge
❸ KORLOY's own technology applied for cutting edge and corner shape controlling chip flow ensures longer tool life
❹ KORLOY special chip breaker design controls chip flow at high speed machining

AK and AR chip breaker specially developed for aluminum



	Recommendation range	Grades
AK	ap=0.004~0.20inch fn =0.001~0.020ipr	H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating)
AR	ap=0.004~0.20inch fn =0.001~0.020ipr	H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating) PD1000(DLC coating)



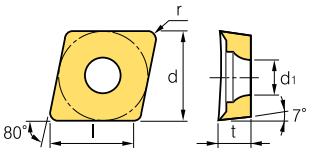
Features of H01 and cutting conditions

• Useful for aluminum and alloyed steel machining • Buffed on top face reduced built-up edge
• 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining

Workpiece		Hardness(HB)	kc(MPa)	vc(sfm)	fn(ipr)
Aluminum alloy (forged)	before heat treatment	50 ~ 70	500 ~ 600	3300~8250	0.004~0.024
	after heat treatment	90 ~ 110	700 ~ 900	990~3300	0.004~0.020
Aluminum alloy (cast)	before heat treatment	70 ~ 80	700 ~ 800	990~3300	0.004~0.024
	after heat treatment	80 ~ 100	800 ~ 950	660~1980	0.004~0.016
Copper alloy	-	90 ~ 110	700	820~1980	0.004~0.020
Non-ferrous metal, etc	-	100	1700	490~990	0.004~0.024

CC ○○

Rhombic **80° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	**d**	**t**	**d1**
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece							
	Steel	P					
	Stainless steel	M					
	Cast iron	K					
	Non-ferrous metal	N	✖	⬌	●	⬌	✖
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types
● Continuous cutting
⬌ General cutting
✖ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	CCGT	**21.50.5-AK**	●			●		0.001~0.005	0.002~0.118
		21.51-AK	●			●		0.001~0.006	0.004~0.118
		21.52-AK				●		0.001~0.008	0.004~0.157
		32.50.5-AK	●			●		0.001~0.008	0.002~0.118
		32.51-AK	●			●		0.001~0.012	0.004~0.197
		32.52-AK	●			●		0.001~0.020	0.004~0.197
		430.5-AK				●		0.001~0.012	0.002~0.157
		431-AK	●			●		0.001~0.020	0.004~0.197
		432-AK				●		0.002~0.031	0.004~0.217
AR 	CCGT	**21.50.5-AR**				●		0.001~0.012	0.012~0.157
		21.51-AR						0.001~0.014	0.020~0.177
		21.52-AR						0.002~0.020	0.020~0.177
		32.50.5-AR				●		0.001~0.018	0.012~0.157
		32.51-AR				●		0.002~0.020	0.020~0.177
		32.52-AR				●		0.002~0.024	0.020~0.236
		430.5-AR						0.002~0.020	0.012~0.197
		431-AR				●		0.002~0.024	0.020~0.236
		432-AR				●		0.002~0.026	0.020~0.236
		433-AR						0.003~0.028	0.020~0.256

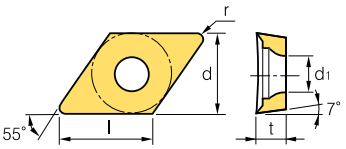
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	**Page**	**Designation**	**Page**
SCACR/L	B123, 164	**SCLCR/L**	B133, 144, 164

DC ○○

Rhombic 55° Positive
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece								
	Steel	P						
	Stainless steel	M						
	Cast iron	K						
	Non-ferrous metal	N	✖	●	●	●	✖	
	Heat resistant alloy, Titanium alloy	S						
	Hardened steel	H						

Machining types
● Continuous cutting
● General cutting
✖ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	DCGT	21.50.5-AK	●			●		0.001~0.008	0.002~0.118
		21.51-AK	●			●		0.001~0.012	0.004~0.157
		21.52-AK	●			●		0.001~0.016	0.004~0.157
		32.50.5-AK	●			●		0.001~0.012	0.002~0.157
		32.51-AK	●		●	●		0.001~0.020	0.004~0.197
		32.52-AK	●			●		0.001~0.020	0.004~0.197
		32.53-AK				●		0.002~0.024	0.006~0.197
AR 	DCGT	21.50.5-AR				●		0.001~0.012	0.012~0.157
		21.51-AR				●		0.001~0.016	0.020~0.197
		21.52-AR				●		0.002~0.020	0.020~0.197
		32.50.5-AR						0.001~0.018	0.012~0.236
		32.51-AR				●		0.002~0.020	0.020~0.236
		32.52-AR				●		0.002~0.024	0.020~0.236
		32.53-AR				●		0.003~0.026	0.020~0.256

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

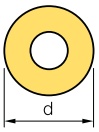
● : Stock item

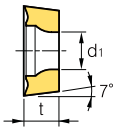
Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B123	SDQCR/L	B145
SDJCR/L	B124,164	SDUCR/L	B145
SDNCN	B124,165	SDZCR/L	B146

RC ○○

Round **Positive**

Relief Angle : 7°





Dimensions(inch)			
Size	d	t	d1
06	0.236	3/32	11/128
08	0.315	1/8	9/64
10	0.394	1/8~5/32	5/32~11/64
12	0.472	3/16	11/64

Workpiece							
	Steel	P					
	Stainless steel	M					
	Cast iron	K					
	Non-ferrous metal	N	✖	➲	●	➲	✖
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types

● Continuous cutting
➲ General cutting
✖ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	RCGT	**0602M0-AK**				●		0.002~0.008	0.020~0.079
		0803M0-AK				●		0.002~0.010	0.020~0.098
		1003M0-AK				●		0.004~0.012	0.039~0.118
		10T3M0-AK						0.004~0.012	0.039~0.118
		1204M0-AK				●		0.004~0.014	0.039~0.138
AR 	RCGT	**0602M0-AR**						0.002~0.008	0.020~0.079
		0803M0-AR						0.002~0.010	0.020~0.098
		1003M0-AR				●		0.004~0.012	0.039~0.118
		10T3M0-AR						0.004~0.012	0.039~0.118
		1204M0-AR						0.004~0.014	0.039~0.138

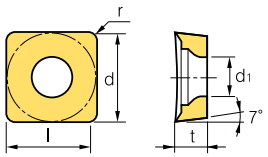
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SRDCN	B124	**SRGCR/L**	B125

SC ○○

Square **90° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
32.5	8/3	5/32	11/64
43	1/2	3/16	7/32

Workpiece							
Steel	P						
Stainless steel	M						
Cast iron	K						
Non-ferrous metal	N	✱	⬌	●	⬌	✱	
Heat resistant alloy, Titanium alloy	S						
Hardened steel	H						

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	SCGT	32.50.5-AK	●					0.001~0.012	0.004~0.157
		32.51-AK	●			●		0.002~0.016	0.004~0.197
		32.52-AK				●		0.001~0.016	0.004~0.197
		431-AK				●		0.001~0.020	0.004~0.197
		432-AK				●		0.002~0.024	0.004~0.217
		434-AK						0.002~0.024	0.004~0.217
AR 	SCGT	32.50.5-AR						0.001~0.016	0.020~0.197
		32.51-AR				●		0.002~0.020	0.020~0.236
		32.52-AR						0.002~0.020	0.020~0.256
		431-AR				●		0.002~0.024	0.020~0.256
		432-AR						0.002~0.024	0.020~0.276
		434-AR						0.002~0.024	0.020~0.276

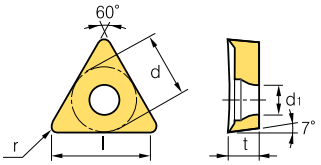
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B125	SSKCR/L	B126
SSDCN	B125	SSSCR/L	B126

TC ○○

Triangular **60° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	13/128

Workpiece								
	Steel	P						
	Stainless steel	M						
	Cast iron	K						
	Non-ferrous metal	N	✖	⬣	●	⬣	✖	
	Heat resistant alloy, Titanium alloy	S						
	Hardened steel	H						

Machining types
● Continuous cutting
⬣ General cutting
✖ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	TCGT	730.5-AK				●		0.000~0.005	0.002~0.118
		731-AK				●		0.001~0.006	0.004~0.157
		21.50.5-AK	●			●		0.001~0.008	0.002~0.157
		21.51-AK	●			●		0.001~0.012	0.004~0.157
		21.52-AK				●		0.001~0.016	0.004~0.197
		32.50.5-AK				●		0.001~0.012	0.002~0.197
		32.51-AK				●		0.001~0.016	0.004~0.217
		32.52-AK				●		0.001~0.020	0.004~0.217
		32.53-AK				●		0.002~0.024	0.006~0.217
		32.54-AK				●		0.002~0.031	0.006~0.217
		32.56.3-AK						0.002~0.035	0.008~0.276
AR 	TCGT	730.5-AR						0.001~0.007	0.012~0.118
		731-AR				●		0.001~0.010	0.012~0.197
		21.50.5-AR						0.001~0.012	0.012~0.157
		21.51-AR				●		0.001~0.016	0.012~0.197
		21.52-AR						0.002~0.018	0.020~0.236
		32.50.5-AR				●		0.001~0.018	0.012~0.197
		32.51-AR				●		0.002~0.020	0.020~0.236
		32.52-AR				●		0.002~0.024	0.020~0.236
		32.53-AR						0.002~0.026	0.020~0.236
		32.54-AR						0.003~0.028	0.020~0.256
		32.56.3-AR						0.004~0.039	0.031~0.276

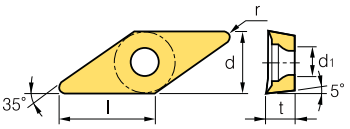
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B126,165	STTCR/L	B127,161
STFCR/L	B126,160	STWCR/L	B161
STGCR/L	B127		

VB ○○

Rhombic **35° Positive**
Relief Angle : 5°



Dimensions(inch)			
Size	**d**	**t**	**d1**
22	1/4	1/8	7/64
33	3/8	3/16	11/64

Workpiece								
Steel	P							
Stainless steel	M							
Cast iron	K							
Non-ferrous metal	N	⧓	⧓	●	⧓	✱		
Heat resistant alloy, Titanium alloy	S							
Hardened steel	H							

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC205K	PC8110	PD1000	H01	H10	fn (ipr)	ap (inch)
AK 	VBGT	**220.5-AK**				●		0.001~0.006	0.002~0.118
		221-AK				●		0.001~0.006	0.004~0.157
		222-AK						0.001~0.007	0.004~0.197
		330.5-AK						0.001~0.012	0.002~0.157
		331-AK				●		0.001~0.016	0.004~0.197
		332-AK				●		0.001~0.020	0.004~0.197
		333-AK						0.002~0.024	0.004~0.217
AR 	VBGT	**220.5-AR**						0.001~0.014	0.012~0.118
		221-AR						0.001~0.018	0.012~0.157
		222-AR						0.001~0.020	0.020~0.236
		330.5-AR						0.002~0.018	0.012~0.197
		331-AR				●		0.002~0.020	0.020~0.236
		332-AR				●		0.002~0.024	0.020~0.236
		333-AR						0.002~0.028	0.020~0.256

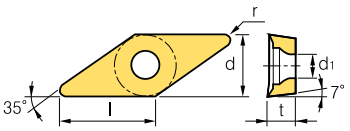
Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

● : Stock item

Available tool holders			
Designation	**Page**	**Designation**	**Page**
SVABR/L	B127	**SVVBN**	B129
SVHBR/L	B128	**SVQBR/L**	B148
SVJBR/L	B128,165	**SVUBR/L**	B149

VC ○○

Rhombic **35° Positive**
Relief Angle : 7°



Dimensions(inch)			
Size	d	t	d1
2.5	5/16	1/8	7/64~9/64
22	1/4	1/8	7/64
33	3/8	3/16	11/64
44.5	1/2	7/32	7/32

Workpiece							
Steel	P						Machining types
Stainless steel	M						
Cast iron	K						● Continuous cutting
Non-ferrous metal	N	✖	⬌	●	⬌	✖	⬌ General cutting
Heat resistant alloy, Titanium alloy	S						✖ Interrupted cutting
Hardened steel	H						

Inserts	Designation		Coated			Uncoated		Cutting Condition	
			PC5040	PC130	PD1000	H01	H10	fn (mm/rev)	ap (inch)
AK 	VCGT	220-AK						0.001~0.006	0.002~0.118
		220.5-AK	●			●		0.001~0.008	0.002~0.118
		221-AK	●			●		0.001~0.010	0.004~0.157
		222-AK						0.001~0.012	0.004~0.197
		2.520.5-AK	●			●		0.001~0.014	0.004~0.197
		2.521-AK	●			●		0.001~0.014	0.004~0.197
		2.522-AK						0.002~0.016	0.004~0.197
		330.5-AK				●		0.001~0.012	0.002~0.197
		331-AK			●	●		0.001~0.016	0.004~0.197
		332-AK				●		0.001~0.020	0.004~0.197
		333-AK				●		0.001~0.020	0.004~0.197
		43.54-AK				●		0.001~0.024	0.004~0.276
		43.56.3-AK						0.002~0.028	0.004~0.276
		43.57.5-AK				●		0.003~0.039	0.004~0.276
AR 	VCGT	220-AR						0.001~0.008	0.004~0.118
		220.5-AR				●		0.001~0.010	0.012~0.118
		221-AR				●		0.001~0.014	0.012~0.157
		222-AR						0.002~0.018	0.020~0.236
		2.520.5-AR						0.001~0.016	0.020~0.118
		2.521-AR				●		0.001~0.018	0.020~0.157
		2.522-AR						0.002~0.020	0.020~0.197
		330.5-AR				●		0.001~0.016	0.012~0.197
		331-AR				●		0.002~0.020	0.020~0.236
		332-AR				●		0.002~0.024	0.020~0.236
		333-AR						0.002~0.026	0.020~0.256
		43.54-AR						0.004~0.026	0.031~0.256
		43.56.3-AR						0.004~0.028	0.031~0.276
		43.57.5-AR				●		0.005~0.030	0.039~0.276

Cutting edge geometry **A38 ~ A43** Recommended chip breaker **B04 ~ B11** Code system **B18 ~ B19**

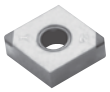
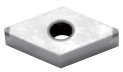
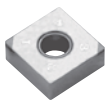
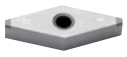
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B128,148,165	**SVQCR/L**	B148
SVVCN	B129	**SVUCR/L**	B144

cBN

Multi-Corner Type (Negative)

Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
44			

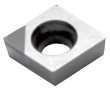
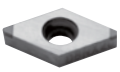
Inserts	Designation		Uncoated										Available tool holders			
			DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation		Page	
CN○○ 80° Nega 	2NU-CNGA	431	●	●		●	●				●		DCBNR/L	DCLNR/L	B 99	B 99
		431F	●				●						MCKNR/	MCLNR/L	B116	B116
		431T	●			●	●						MCMNN	PCBNR/L	B116	B104
		431W	●										PCLNR/L		B105	
		431WF	●													
		432	●	●		●	●				●					
		432F	●				●									
		432T	●			●	●									
		432W	●	●		●	●				●					
		432WF	●				●									
		432WT				●	●									
		433	●	●												
		433F	●													
		433T	●													
		433W	●			●	●				●					
		433WF	●				●									
		433WT				●	●									
	T-2NU-CNGA	432	●													
	2NU-CNMA	431							●							
		432							●							
	2NS-CNGA	432			●			●								
DN○○ 55° Nega 	2NU-DNGA	431	●	●		●	●		●		●		DDJNR/L	MDJNR/L	B 100	B117
		431F	●				●						MDNNN	MDQNR/L	B117	B118
		431T	●			●	●						MDUNR/L	PDJNR/L	B142	B105
		432	●	●		●	●		●		●		PDNNR/L	PDSNR/L	B106	B138
		432F	●				●						PDUNR/L		B139	
		432T	●			●	●									
		433	●	●												
		433F	●													
		433T	●													
		442										●				
	T-2NU-DNGA	443	●													
	2NS-DNGA	442			●			●								
SN○○ 90° Nega 	4NU-SNGA	431	●			●	●				●		DSBNR/L	MSBNR/L	B100	B118
		431F					●						MSDNN	MSKNR/L	B118	B119
		431T				●	●						MSRNR/L	MSSNR/L	B119	B120
		432	●			●	●				●		PSBNR/L	PSDNN	B108	B108
		432F					●						PSKNR/L		B109	
		432T				●	●									
		433									●					
	2NS-SNGA	432			●			●								
TN○○ 60° Nega 	3NU-TNGA	331	●	●		●	●		●		●		MTENN	MTFNR/L	B120	B120
		331F	●				●						MTGNR/	MTJNR/L	B121	B121
		331T	●			●	●						PTFNR/L	PTGNR/L	B110	B110
		332	●	●		●	●				●		PTTNR/L	WTENN	B111	B112
		332F	●				●						WTJNR/L	WTXNR/L	B112	B112
		332T	●			●	●									
		333		●												
	2NS-TNGA	332			●			●								
VN○○ 35° Nega 	2NU-VNGA	331	●	●		●	●		●		●		MVJNR/L		B121	
		331F	●				●						MVQNR/L		B122	
		331T	●			●	●						MVUNR/L		B143	
		332	●	●		●	●		●		●		MVVNN		B122	
		332F	●				●									
		332T	●			●	●									
	2NS-VNGA	332			●			●								

● : Stock item

cBN

Multi-Corner Type (Positive)

Dimensions(inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	7/64

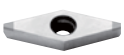
Inserts	Designation		Uncoated										Available tool holders	
			DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation	Page
CC○○ 80° Posi 	2NU-CCGW	21.50.5	●										SCACR/L	B123
		21.50.5F	●										SCLCR/L	B123
		21.50.5T	●											
		21.51	●			●	●							
		21.51F	●				●							
		21.51T	●			●	●							
		21.52				●	●							
		21.52F					●							
		21.52T				●	●							
		32.51	●	●		●	●		●		●			
		32.51F	●				●							
		32.51T	●			●	●							
		32.52	●	●		●	●		●		●			
		32.52F	●				●							
		32.52T	●			●	●							
		32.52W	●											
		32.52WF	●											
DC○○ 55° Posi 	2NU-DCGW	21.51				●	●						SDACR/L	B123
		21.51F					●						SDJCR/L	B124
		21.51T				●	●						SDNCN	B145
		21.52				●	●						SDQCR/L	B145
		21.52F					●						SDUCR/L	B146
		21.52T				●	●						SDZCR/L	
		32.51	●	●		●	●		●		●			
		32.51F	●				●							
		32.51T	●			●	●							
		32.52	●	●		●	●		●		●			
		32.52F	●				●							
		32.52T	●			●	●							
	T-2NU-DCGW	32.51	●											
TC○○ 60° Posi 	3NU-TCGW	731	●										STACR/L	B126
		731F	●										STFCR/L	B126
		731T	●										STGCR/L	B127
													STTCR/L	B127

● : Stock item

cBN

Multi-Corner Type (Positive)

Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	7/64
33	3/8	3/16	11/64

Inserts	Designation		Uncoated										Available tool holders		
			DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation	Page	
TP○○ 60° Posi 	3NU-TPGB	221	●						●				CTFPR/L	B115	
		221F	●										CTGPR/L	B115	
		221T	●												
		222	●						●						
		222F	●												
		222T	●												
	3NU-TPGN	221				●	●						CTFPR/L	B115	B141
		221F					●						CTGPR/L	B115	
		221T				●	●								
		222				●	●								
		222F					●								
		222T				●	●								
		331	●	●											
		332	●	●											
	3NU-TPGW	221	●	●		●	●				●				
		221F	●				●								
		221T	●			●	●								
		222	●	●		●	●				●				
		222F	●				●								
		222T	●			●	●								
VB○○ 35° Posi 	2NU-VBGW	331	●	●		●	●		●		●		SVABR/L	B127	
		331F	●				●						SVHBR/L	B128	
		331T	●			●	●						SVJBR/L	B128	
		332	●	●		●	●		●		●		SVQBR/L	B148	
		332F	●				●						SVUBR/L	B149	
		332T	●			●	●								
VC○○ 35° Posi 	2NU-VCGW	331	●	●		●	●				●				
		331F	●				●								
		331T	●			●	●								
		332	●	●		●	●				●				
		332F	●				●								
		332T	●			●	●								

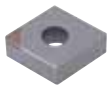
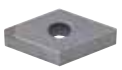
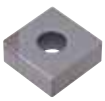
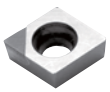
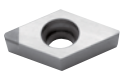
● : Stock item

cBN

Regrinding Type (Negative / Positive)

Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	-
32.5	3/8	5/32	11/64

Dimensions(inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Inserts	Designation		Uncoated									Available tool holders			
			DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation		Page	
CN○○ 80° Nega 	CNMA	431							●				DCBNR/L	MCKNR/L	B99	B116
		432							●			●	DCLNR/L	MCLNR/L	B100	B116
	T-CNMA	432							●				PCBNR/L	MCMNN	B104	B116
													PCLNR/L		B105	
DN○○ 55° Nega 	DNMA	431							●				DDJNR/L	MDJNR/L	B100	B117
		432							●	●			MDNNN	MDQNR/L	B117	B118
													MDUNR/L	PDJNR/L	B142	B105
													PDNNR/L	PDSNR/L	B106	B137
													PDUNR/L		B139	
SN○○ 90° Nega 	SNMA	431							●				DSBNR/L	MSBNR/L	B100	B118
		432							●				MSDNN	MSKNR/L	B118	B119
													MSRNR/L	MSSNR/L	B119	B120
													PSBNR/L	PSDNN	B108	B108
													PSKNR/L		B109	
TN○○ 60° Nega 	TNMA	331							●				MTENNS	MTFNR/L	B120	B120
		332							●				MTGNR/L	MTJNR/L	B121	B121
													PTFNR/L	PTGNR/L	B110	B110
													PTTNR/L	WTENN	B111	B112
													WTJNR/L	WTXNR/L	B112	B112
VN○○ 35° Nega 	VNMA	331							●				MVJNR/L		B121	
		332							●				MVQNR/L		B122	
	T-VNMA	331							●				MVUNR/L		B143	
													MVVNN		B122	
CC○○ CP○○ 80° Posi  (CCMW)	CCMW	32.51							●				SCACR/L		B123	
													SCLCR/L		B123	
DC○○ 50° Posi 	DCGW	32.52							●				SDACR/L		B123	
	T-DCGW	32.52							●				SDJCR/L		B124	
													SDNCN/L		B124	
TP○○ 60° Posi 	TPGB	221							●	●			CTFPR/L		B115	B141
		222							●				CTGPR/L		B115	
VB○○ 35° Posi 	VBMW	331							●				SVABR/L		B127	
		332							●				SVHBR/L		B128	
													SVJBR/L		B128	
													SVQBR/L		B148	
													SVUBR/L		B149	

● : Stock item

PCD

Insert (Negative / Positive)

Dimensions(inch)			
Size	d	t	d1
2.5	5/16	3/32	5/32
21.5	1/4	3/32	7/64
32	3/8	1/8	11/64

Dimensions(inch)			
Size	d	t	d1
32.5	3/8	5/32	11/64
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Inserts	Designation		Grades			Available tool holders			
			DP90	DP150	DP200	Designation		Page	
CN○○ 80° Nega (CNMX)	CNMM	431		●		DCBNR/L	DCLNR/L	B 99	B 99
		432		●		MCKNR/L	MCLNR/L	B116	B116
		433				MCMNN	PCBNR/L	B116	B104
	CNMX	431				PCLNR/L		B105	
		432							
		433							
DN○○ 55° Nega (DNMX)	DNMM	431		●		DDJNR/L	MDJNR/L	B100	B117
		432		●		MDNNN	MDQNR/L	B116	B118
		433				MDUNR/L	PDJNR/L	B142	B105
	DNMX	431				PDNNR/L	PDSNR/L	B106	B138
		432				PDUNR/L		B139	
		433							
TN○○ 60° Nega	TNMX	331				MTENNS	MTFNR/L	B120	B120
		332				MTGNR/L	MTJNR/L	B121	B121
		333				PTFNR/L	PTGNR/L	B110	B110
						PTTNR/L	WTENN	B111	B112
						WTJNR/L	WTXNR/L	B112	B112
VN○○ 35° Nega	VNMX	431				MVJNR/L		B121	
		432				MVQNR/L		B122	
		433				MVUNR/L		B143	
						MVVNN		B122	
CC○○ CP○○ 80° Posi	CCMT	21.50.5		●		SCACR/L		B123	
		21.51		●		SCLCR/L		B123	
		21.52							
		32.51		●					
		32.52		●					
		32.53							
	CPMT	2.51.51							
		2.51.52							
		2.51.53							
		321							
		322							
		323							
DC○○ 55° Posi	DCMT	21.50.5		●		SDACR/L		B123	
		21.51		●		SDJCR/L		B124	
		21.52				SDNCN		B145	
		32.50.5				SDQCR/L		B145	
		32.51		●		SDUCR/L		B146	
		32.52		●		SDZCR/L			
SC○○ SP○○ 90° Posi (SCMT)	SCMT	32.51				SSBCR/L		B125	
		32.52				SSDCN		B125	
		32.53				SSKCR/L		B126	
	SPGW	32.50.5				SSSCR/L		B126	
		32.51							
		32.52							

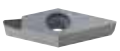
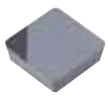
● : Stock item

PCD

Insert (Positive)

Dimensions(inch)			
Size	d	t	d1
22	1/4	1/8	7/64
23	1/4	3/32	7/64
32	3/8	1/8	-
33	3/8	3/16	11/64

Dimensions(inch)			
Size	d	t	d1
42	1/2	1/8	-
52	5/32	1/16	7/64
63	3/16	3/32	3/32
73	7/32	3/32	3/32

Inserts	Designation		Grades			Available tool holders	
			DP90	DP150	DP200	Designation	Page
TB ○○ TC ○○ TP ○○ 60° Posi  (TBGN)	TBGW	520.5				STUBR/L	B150
		521					
	TCMT	730				STACR/L	B126
		730.5				STFCR/L	B126
		731				STFPR/L	B154
		230				STGCR/L	B127
		230.5				STTCR/L	B127
		231					
	TPGB	631					
		632					
		731		●			
		732		●			
		221					
		222					
	TPGW	630.5					
		631					
		731	●				
		732	●				
		220.5					
		221		●			
		222		●			
		331					
		332					
	TPGT	220.5				STFPR/L	B147
		221				STUPR/L	B150
VB ○○ VC ○○ 35° Posi 	VBMT	220.5				SVABR/L	B127
		221		●		SVHBR/L	B128
		222		●		SVJBR/L	B128
		330.5				SVQBR/L	B148
		331		●		SVUBR/L	B149
		332		●			
		333		●			
	VCMT	220.5				SVJCR	B128
		221		●		SVVCN	B129
		222		●			
		331		●			
		332		●			
		333					
TP ○○ 60° Posi 	TPGN	731				CTFPR/L	B115
		732				CTGPR/L	B115
		220.5					
		221		●			
		222		●			
		320.5					
		321					
		322					
SP ○○ 90° Posi 	SPGN	321		●		CSDPN	B114
		322				CSKPR/L	B115
		421					
		422					

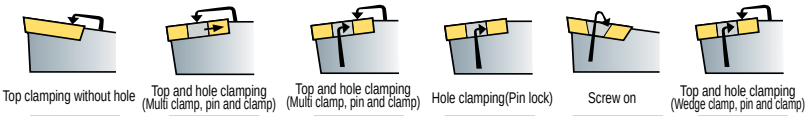
● : Stock item

P S K N R 16 - 4 D

1	2	3	4	5	6	7	8
Clamping Method of Insert	Insert Shape	Holder Style	Clearance Angle of Insert	Hand	Height of Shank	Length of Insert Cutting Edge	Length of Holder

1 Clamping Method of Insert

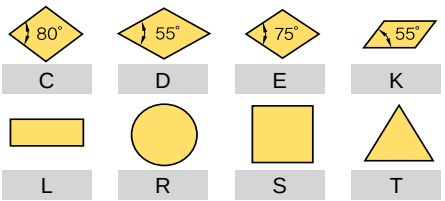
P S K N R 16 - 4 D



C | D | M | P | S | W

2 Insert Shape

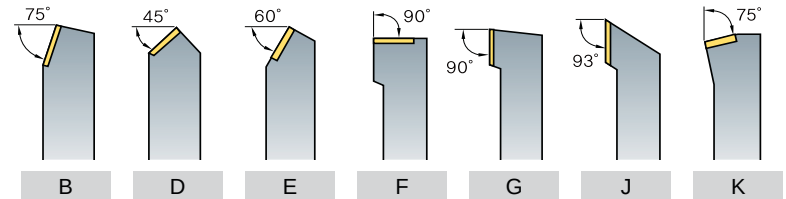
P S K N R 16 - 4 D



C | D | E | K | L | R | S | T | V | W

3 Holder Style

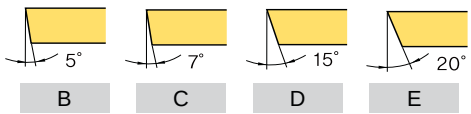
P S K N R 16 - 4 D



B | D | E | F | G | J | K | L | N | R | S | T | V | Y

4 Clearance Angle of Insert

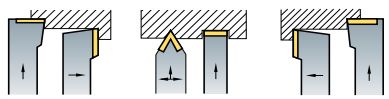
P S K N R 16 - 4 D



B | C | D | E | F | N | P

5 Hand

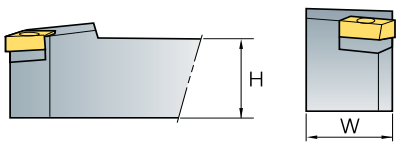
P S K N R 16 - 4 D



L | N | R

6 Height of Shank

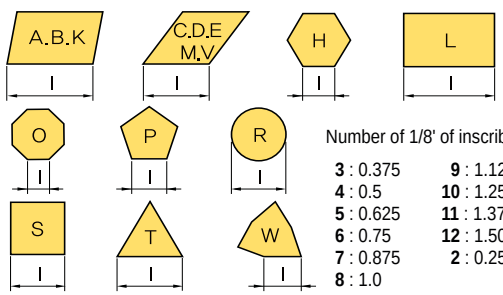
P S K N R 16 - 4 D



No.	width	Height	No.	width	Height
10	0.625	0.625	06	0.375	0.375
12	0.75	0.75	05	0.3125	0.3125
16	1.00	1.00	64	0.75	1.00
20	1.25	1.25	66	1.75	1.50
24	1.50	1.50	85	1.00	1.25
32	2.00	2.00	86	1.00	1.50
08	0.50	0.50	91	1.25	1.50

7 Length of Insert Cutting Edge

P S K N R 16 - 4 D

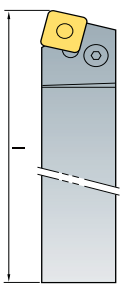


Number of 1/8' of inscribed circle

3 : 0.375 **9** : 1.125
4 : 0.5 **10** : 1.250
5 : 0.625 **11** : 1.375
6 : 0.75 **12** : 1.50
7 : 0.875 **2** : 0.25
8 : 1.0

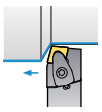
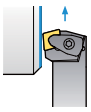
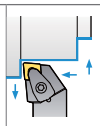
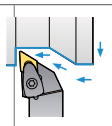
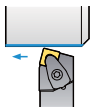
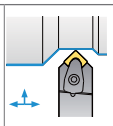
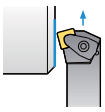
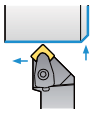
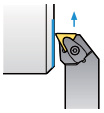
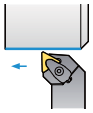
8 Length of Holder

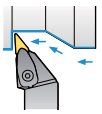
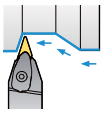
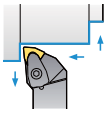
P S K N R 16 - 4 D



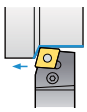
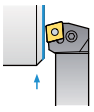
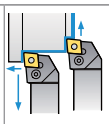
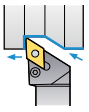
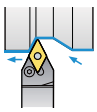
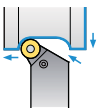
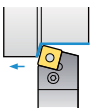
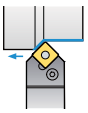
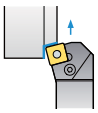
A : Qualified back and end 4' long
B : Qualified back and end 4.5' long
C : Qualified back and end 5' long
D : Qualified back and end 6' long
E : Qualified back and end 7' long
F : Qualified back and end 8' long
M : Qualified back and end 4' long
N : Qualified back and end 4.5' long
P : Qualified back and end 5' long
R : Qualified back and end 6' long
S : Qualified back and end 7' long
T : Qualified back and end 8' long
G : Qualified back and end 10' long
H : Qualified back and end 12' long
I : Qualified back and end 2.5' long
J : Qualified back and end 2.75' long
K : Qualified back and end 3.15' long
x : Special

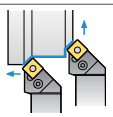
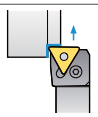
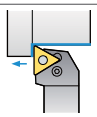
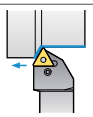
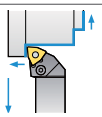
Double Clamp System

Cutting Shape										
Designation	DCBNR/L	DCKNR/L	DCLNR/L	DDJNR/L	DSBNR/L	DSDNN	DSKNR/L	DSSNR/L	DTFNR/L	DTGNR/L
Approach angle	75°	75°	95°	93°	75°	45°	75°	45°	90°	90°
Page	B99	B99	B99	B100	B100	B101	B101	B101	B102	B102
Turning	●		●	●	●	●		●		●
Copying				●						
Facing		●	●				●	●	●	
Chamfering						●				
Back turning			●	●						

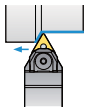
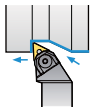
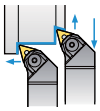
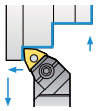
Cutting Shape			
Designation	DVJNR/L	DVVNN	DWLNR
Approach angle	93°	72.5°	95°
Page	B102	B103	B103
Turning	●	●	●
Copying	●	●	
Facing			●
Chamfering			
Back turning	●		●

Lever Lock System

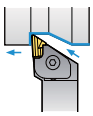
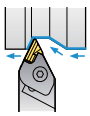
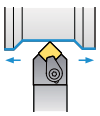
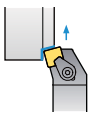
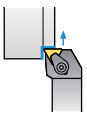
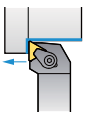
Cutting Shape										
Designation	PCBNR/L	PCKNR/L	PCLNR/L	PDJNR/L	PDNNR/L	PRDCN	PRGCR/L	PSBNR/L	PSDNN	PSKNR/L
Approach angle	75°	75°	95°	93°	62.5°	-	-	75°	45°	75°
Page	B104	B104	B105	B105, B106	B106	B107	B107	B108	B108	B109
Turning	●	●	●	●	●	●	●	●	●	
Copying				●	●	●	●			
Facing			●							●
Chamfering										
Back turning			●	●						

Cutting Shape					
Designation	PSSNR/L	PTFNR/L	PTGNR/L	PTTNR/L	PWLNR/L
Approach angle	45°	90°	90°	60°	95°
Page	B109	B110	B110	B111	B111
Turning	●		●	●	●
Copying					
Facing	●	●			●
Chamfering				●	
Back turning					●

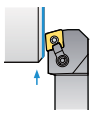
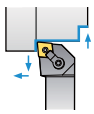
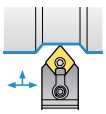
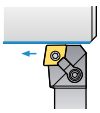
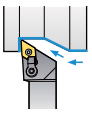
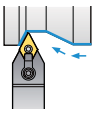
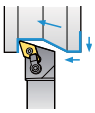
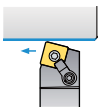
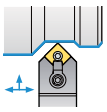
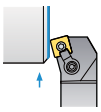
Wedge Clamp System

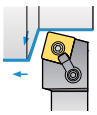
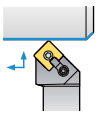
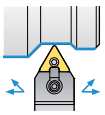
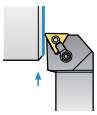
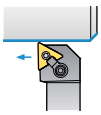
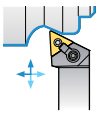
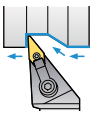
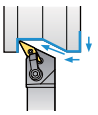
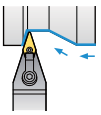
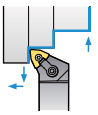
Cutting Shape										
Designation	WTENN	WTJNR/L	WTXNR/L	WWLNR/L						
Approach angle	60°	93°	105°	95°						
Page	B112	B112	B112	B113						
Turning	●	●	●	●						
Copying	●	●	●							
Facing				●						
Chamfering										
Back turning		●	●	●						

Clamp on System

Cutting Shape										
Designation	CKJNR/L	CKNNR/L	CSDPN	CSKPR/L	CTFPR/L	CTGPR/L				
Approach angle	93°	62.5°	45°	75°	90°	90°				
Page	B114	B114	B114	B115	B115	B115				
Turning	●	●	●			●				
Copying	●	●								
Facing				●	●					
Chamfering										
Back turning	●									

Multi Lock System

Cutting Shape										
Designation	MCKNR/L	MCLNR/L	MCMNN	MCRNR/L	MDJNR/L	MDNNN	MDQNR/L	MSBNR/L	MSDNN	MSKNR/L
Approach angle	75°	95°	50°	75°	93°	62.5°	107.5°	75°	45°	75°
Page	B116	B116	B116	B117	B117	B117	B118	B118	B118	B119
Turning		●	●	●	●	●	●	●	●	
Copying					●	●	●			
Facing	●	●								●
Chamfering										
Back turning		●			●		●			

Cutting Shape										
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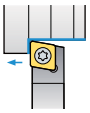
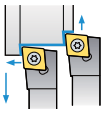
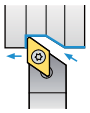
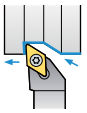
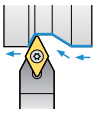
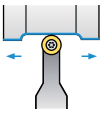
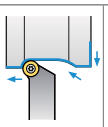
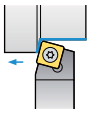
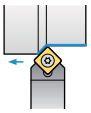
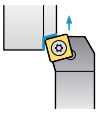
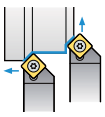
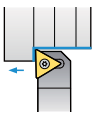
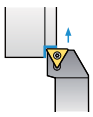
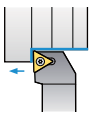
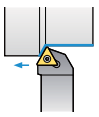
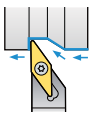
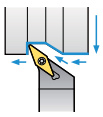
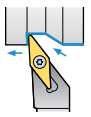
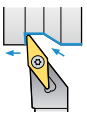
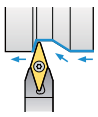
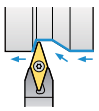
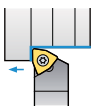
Approach angle	75°	45°	60°	90°	90°	93°	93°	117.5°	72.5°	95°
Page	B119	B120	B120	B120	B121	B121	B121	B122	B122	B122
Turning	●	●	●		●	●	●	●	●	●
Copying			●			●	●	●	●	
Facing		●		●		●				●
Chamfering										
Back turning						●	●	●		●

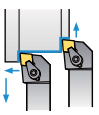
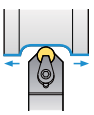
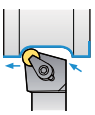
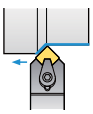
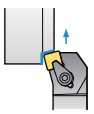
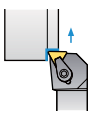
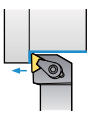
Screw on System

Cutting Shape										
Designation	SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SRDCN	SRGCR/L	SSBCR/L	SSDCN	SSKCR/L
Approach angle	90°	95°	90°	93°	62.5°	-	-	75°	45°	75°
Page	B123	B123	B123	B124	B124	B124	B125	B125	B125	B126
Turning	●	●	●	●	●	●	●	●	●	
Copying			●	●	●	●	●			
Facing		●								●
Chamfering										
Back turning		●		●						

Cutting Shape										
Designation	SSSCR/L	STACR/L	STFCR/L	STGCR/L	STTCR/L	SVABR/L	SVHBR/L	SVJBR/L	SVJCR/L	SVVBN
Approach angle	45°	90°	90°	90°	60°	90°	107.5°	93°	93°	72.5°
Page	B126	B126	B126	B127	B127	B127	B128	B128	B128	B129
Turning	●	●		●	●	●	●	●	●	●
Copying						●	●	●	●	●
Facing	●		●							
Chamfering										
Back turning						●	●	●	●	

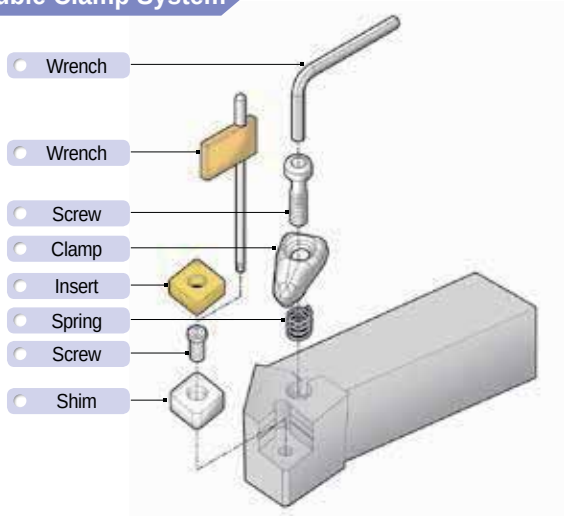
Cutting Shape		
Designation	SVVCN	SWACR/L
Approach angle	72.5°	90°
Page	B129	B129
Turning	●	●
Copying	●	
Facing		
Chamfering		
Back turning		

Ceramic Holder

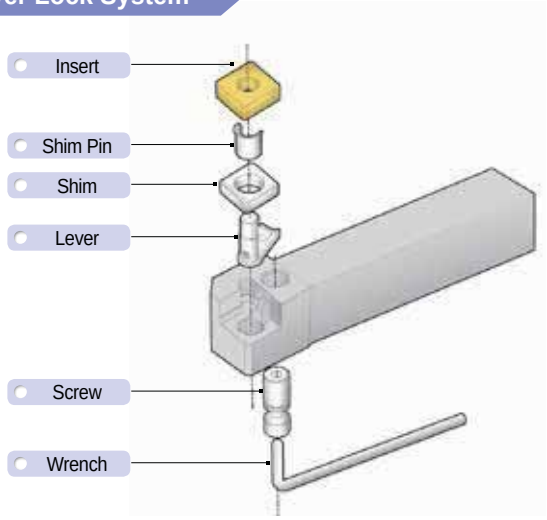
Cutting Shape							
Designation	CCNLR/L	CRDNN	CRGNR/L	CSDNN	CSKNR/L	CTFNR/L	CTGNR/L
Approach angle	95°	-	-	45°	75°	90°	90°
Page	B130	B130	B130	B130	B131	B131	B131
Turning	●	●	●	●			●
Copying			●				
Facing	●				●	●	
Chamfering							
Back turning	●						

Instruction of External Holder

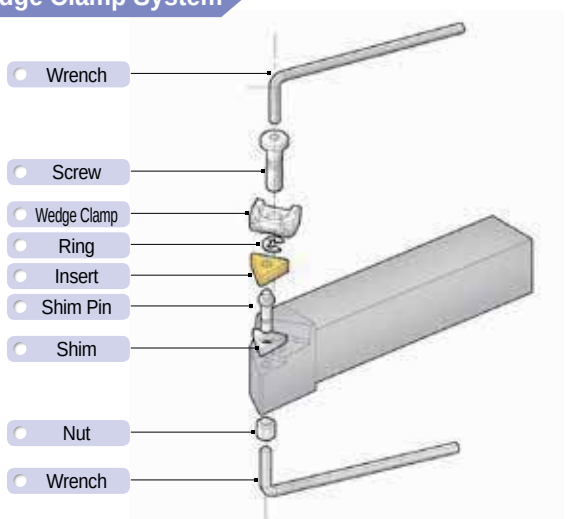
Double Clamp System



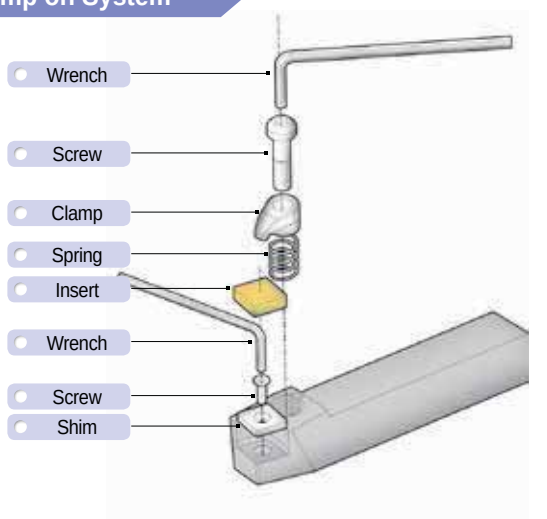
Lever Lock System



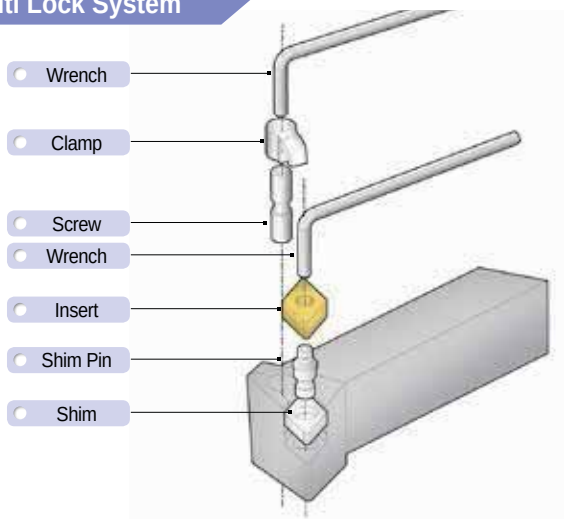
Wedge Clamp System



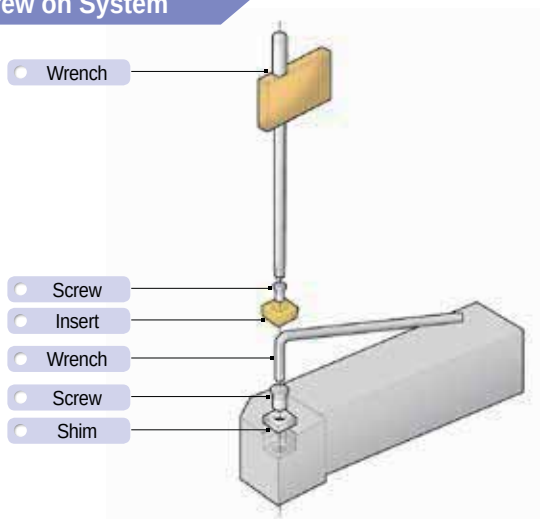
Clamp on System



Multi Lock System



Screw on System

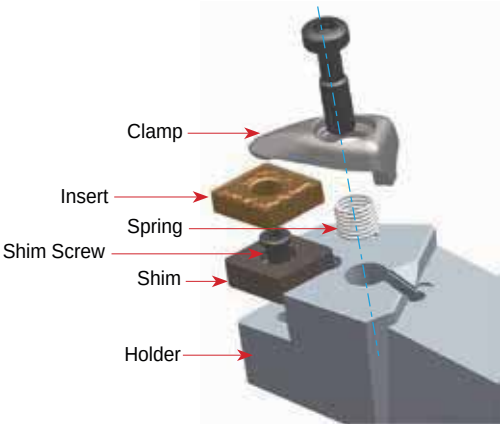


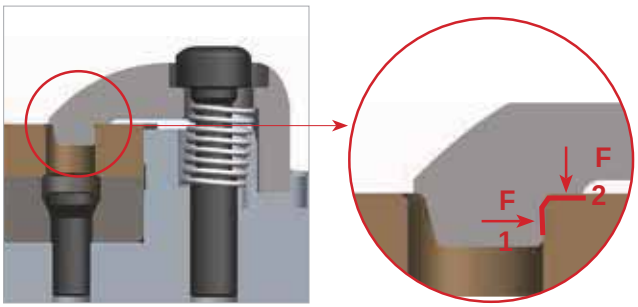
Double Clamp System

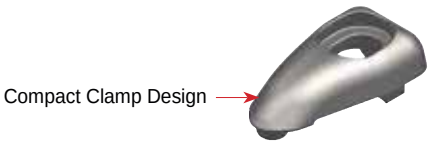
Stable clamping with double clamp system

Features

- Simple and powerful clamping system operated by only a single clamp screw
- The powerful double-clamping system (upper and internal) is suitable for machining in very tough cutting conditions
- The holder offers precision due to the special design in the rear of the clamp
- Compact and optimized design for avoiding chip interference with a powerful clamp





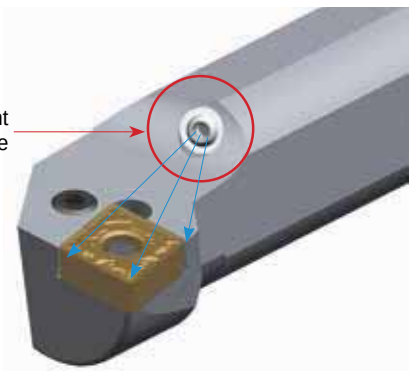


Lever Lock System

Stable clamping with double clamp system

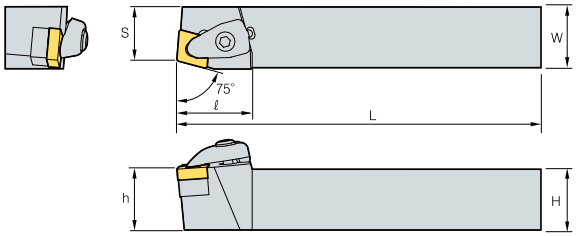
Features

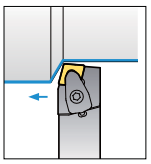
- The holder offers precision due to the special design due to the improved Lever tip seat
- The durability of parts has been improved
- Superior tool life due to powerful clamping system and optimized design of part.
- Part designation on holder body makes it easy to check the right part description for each product
- Adjustable coolant nozzle gives the option to change the direction of the coolant to optimize chip control and improve tool life



DCBNR/L

CN□□





75°

• R type insert

(inch)

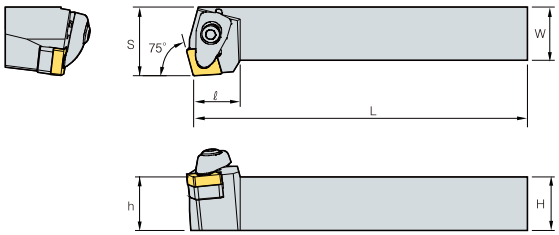
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DCBNR/L	**12-4B**	3/4	3/4	4 1/2	0.600	0.750	1.220	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	0.790	1.220							
	85-4D	1 1/4	1	6	1.250	1.063	1.220							
	16-5D	1	1	6	0.790	1.000	1.417	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.417							
	20-6D	1 1/4	1/ 1/4	6	0.990	1.250	1.574	CN□□64□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.574							

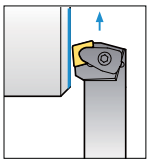
Applicable inserts **B20 ~ B25**

● : Stock item

DCKNR/L

CN□□





75°

• R type insert

(inch)

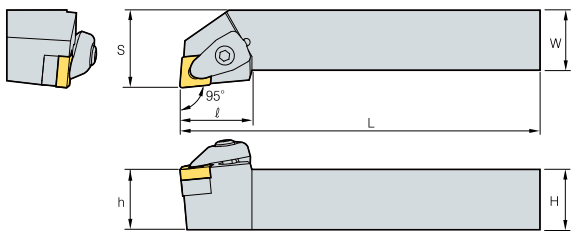
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DCKNR/L	**12-4B**	3/4	3/4	4 1/2	0.790	0.750	0.827	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.063	0.790	0.827							
	85-4D	1 1/4	1	6	1.063	1.063	0.827							
	20-5D	1 1/4	1/ 1/4	6	1.500	1.063	1.024	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	24-5D	1 1/2	1 1/2	7	2.000	1.500	1.024							

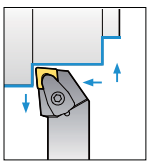
Applicable inserts **B20 ~ B25**

● : Stock item

DCLNR/L

CN□□





95°

• R type insert

(inch)

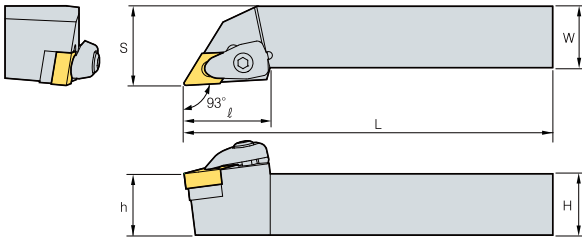
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DCLNR/L	**12-3B**	3/4	3/4	4/12	1.000	0.750	0.964	CN□□32□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	1.250	1.000	0.964							
	12-4B	1	1	6	1.250	1.000	1.181	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.250	1.250	1.181							
	85-4D	1 1/4	1	6	1.500	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.181							
	16-5D	1	1	6	1.250	1.000	1.417	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	85-5D	1 1/4	1	6	1.250	1.250	1.417							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.417							
	16-6D	1	1	6	1.250	1.000	1.575	CN□□64□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	85-6D	1 1/4	1	6	1.250	1.250	1.575							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.575							
	24-6D	1 1/2	1 1/2	6	2.000	1.250	1.575							

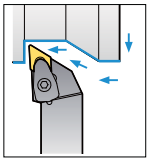
Applicable inserts **B20 ~ B25**

● : Stock item

DDJNR/L

DN□□





93°

• R type insert

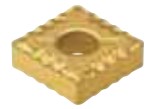
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DDJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.181	DN□□33□	CVH3	CHX04	15SD32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	1.250	1.000	1.181							
	85-3D	1 1/4	1	6	1.250	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.181							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□44□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.250	1.000	1.378							
	85-4D	1 1/4	1	6	1.250	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□43□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	HW30P
	16-4D-3	1	1	6	1.250	1.000	1.378							
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.378							

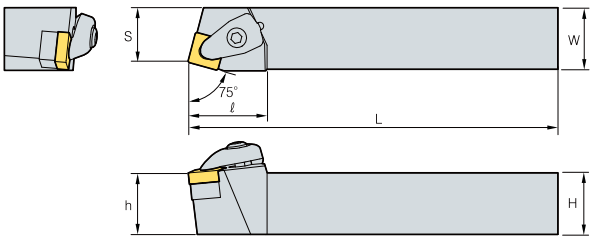
Applicable inserts **B26 ~ B31**

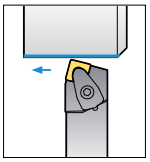
● : Stock item

DSBNR/L



SN□□





75°

• R type insert

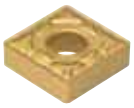
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DSBNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	0.984	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	16-3B	1	1	6	0.790	1.000	0.984							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.260	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.260							
	85-4D	1 1/4	1	6	0.790	1.250	1.260							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.260							
	16-5D	1	1	6	0.790	1.000	1.496	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	85-5D	1 1/4	1	6	0.790	1.250	1.496							
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.693	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.693							

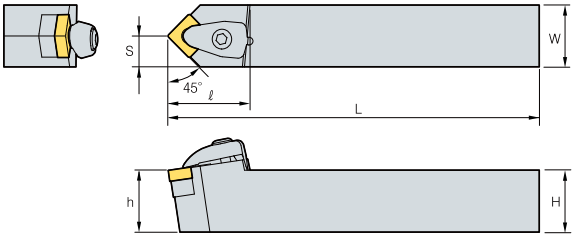
Applicable inserts **B33 ~ B40**

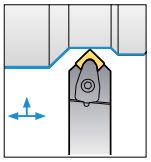
● : Stock item

DSDNN



SN□□





45°

• R type insert

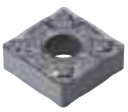
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DSDNN	**12-3B**	3/4	3/4	4 1/2	0.375	0.750	1.043	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.299	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.500	1.000	1.299							
	85-4D	1 1/4	1	6	0.500	1.000	1.299							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.299							
	16-5D	1 1/4	1 1/4	6	0.500	1.000	1.551	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.693	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.771							

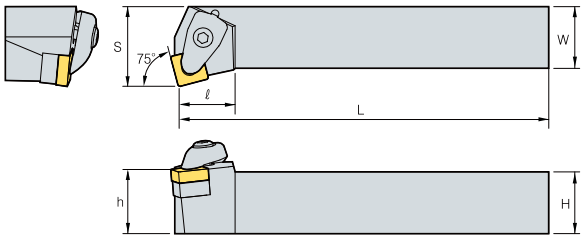
Applicable inserts **B33 ~ B40**

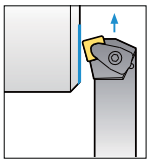
● : Stock item

DSKNR/L



SN□□





75°

• R type insert

(inch)

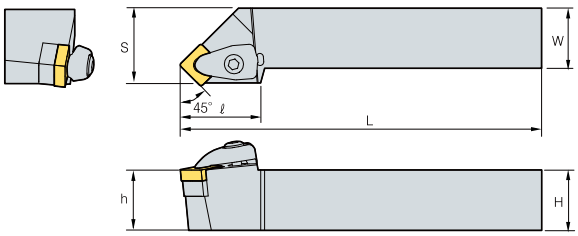
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DSKNR/L	**12-3B**	3/4	3/4	4 1/2	1.00	0.750	0.787	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	1.00	0.750	0.906	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.25	1.000	0.906							
	20-4D	1 1/4	1 1/4	6	1.50	1.250	0.906							
	20-5D	1 1/4	1 1/4	6	1.50	1.250	1.102	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	20-6D	1 1/4	1 1/4	6	1.50	1.250	1.378	SN□□64□	CVH6	CHX0622	SC64V	FTNA0511	SPR0811	HW40L
	25-6E	1 1/2	1 1/2	7	2.00	1.500	1.693							

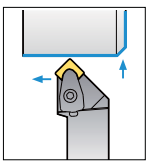
Applicable inserts **B33 ~ B40**

● : Stock item

DSSNR/L

SN□□





45°

• R type insert

(inch)

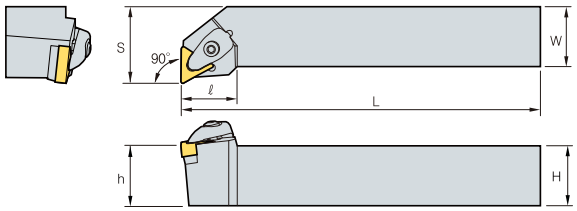
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DSSNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	1.220	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.378	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.378							
	85-4D	1 1/4	1	6	0.790	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.378							
	16-5D	1	1	6	0.790	1.000	1.516	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.516							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.811	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.811							

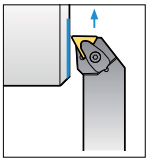
Applicable inserts **B33 ~ B40**

● : Stock item

DTFNR/L

TN□□





90°

• R type insert

(inch)

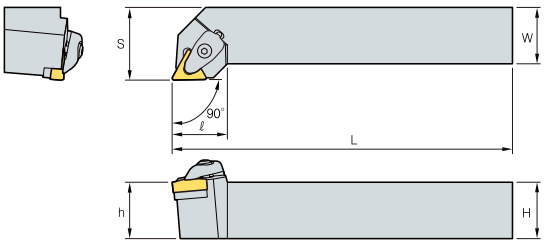
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DTFNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	0.965	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.790	1.000	0.965							
	20-3D	1 1/4	1 1/4	6	0.990	1.250	0.965							
	16-4D	1	1	6	0.790	1.000	1.299	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	85-4D	1 1/4	1	6	0.790	1.250	1.299							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.299							

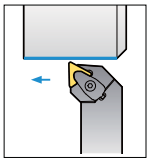
Applicable inserts **B41 ~ B48**

● : Stock item

DTGNR/L

TN□□





90°

• R type insert

(inch)

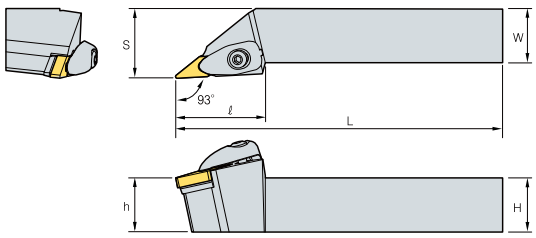
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DTGNR/L	**12-3B**	3/4	3/4	4 1/2	0.60	0.75	0.965	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.79	1.00	0.965							
	20-3D	1 1/4	1 1/4	6	0.99	1.25	0.965							
	16-4D	1	1	6	0.79	1.00	1.283	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	85-4D	1 1/4	1	6	0.79	1.25	1.283							
	20-4D	1 1/4	1 1/4	6	0.99	1.25	1.283							

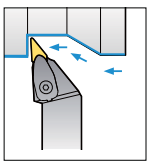
Applicable inserts **B41 ~ B48**

● : Stock item

DVJNR/L

VN□□





93°

• R type insert

(inch)

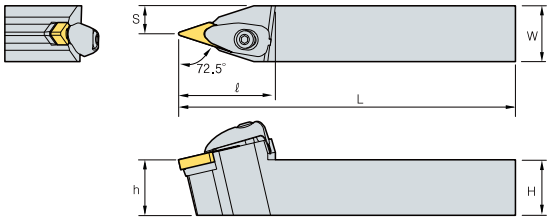
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DVJNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	1.634	VN□□33□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	16-3D	1	1	6	0.790	1.000	1.634							
	20-3D	1 1/4	1 1/4	6	0.990	1.250	1.634							

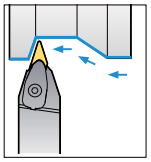
Applicable inserts **B49 ~ B50**

● : Stock item

DVVNN

VN□□





72.5°

• R type insert

(inch)

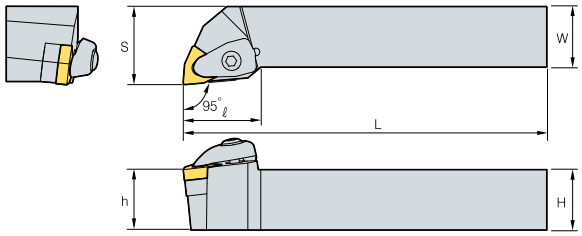
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DVVNN	**12-3B**	3/4	3/4	4 1/2	0.375	0.750	1.575	VN□□33□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	16-3D	1	1	6	0.500	1.000	1.575							
	20-3D	1 1/4	1 1/4	6	0.625	1.250	1.575							

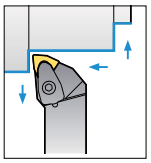
Applicable inserts **B49 ~ B50**

● : Stock item

DWLNR/L

WN□□





95°

• R type insert

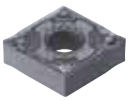
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Wrench
DWLNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	1.024	WN□□33□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.790	1.000	1.024							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.260	WN□□43□	CVH4	CHX0518	SW44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.260							

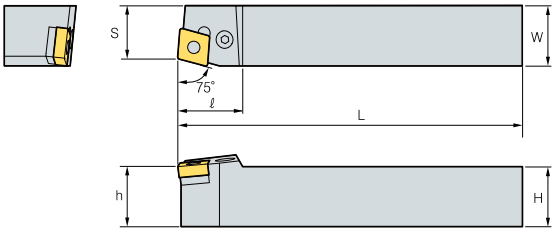
Applicable inserts **B51 ~ B54**

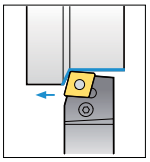
● : Stock item

PCBNR/L



CN□□





75°

• R type insert

(inch)

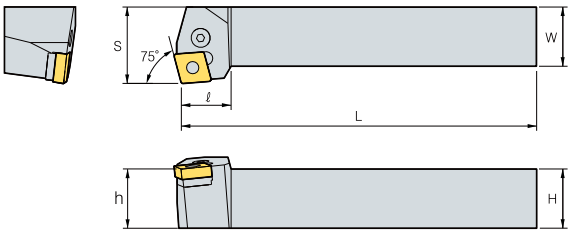
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PCBNR/L	**12-4B**	3/4	3/4	4 1/2	0.600	0.750	1.063	CN□□43□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.790	0.790	1.000							
	85-4D	1/4	1	6	1.250	1.063	1.063							
	16-5D	1	1	6	0.790	1.000	1.299	CN□□54□	LV5	VHX0825	SC53	SP5	HW30L	LSPS6
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.299							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.496	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.496							
	24-8E	1 1/2	1 1/2	7	1.186	1.500	1.772	CN□□86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	24-8E-5	1 1/2	1 1/2	7	1.186	1.500	1.772	CN□□85□						
	32-8G	2	2	8	1.693	2.000	1.772	CN□□86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
PCBNR/L	**12-4BN**	3/4	3/4	4 1/2	0.600	0.750	1.063	CN□□43□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.790	0.790	1.000							
	85-4DN	1/4	1	6	1.250	1.063	1.063							
	16-5DN	1	1	6	0.790	1.000	1.299	CN□□54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0.990	1.250	1.299							

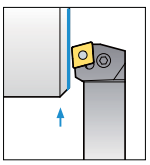
Applicable inserts **B20 ~ B25**

● : Stock item

PCKNR/L

CN□□





95°

• R type insert

(inch)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PCKNR/L	**12-4B**	3/4	3/4	4 1/2	0.984	0.787	1.063	CN□□43□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.260	0.984	1.063							
	85-4D	1/4	1	6	1.500	1.260	1.181							
	20-5D	1 1/4	1 1/4	6	1.500	1.260	1.023	CN□□54□□	LV5	VHX0825	SC53	SP5	HW30L	HW30L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	0.984							
PCKNR/L	**12-4BN**	3/4	3/4	4 1/2	0.984	0.787	1.063	CN□□43□□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.260	0.984	1.063							
	85-4DN	1/4	1	6	1.500	1.260	1.181							
	20-5DN	1 1/4	1 1/4	6	1.500	1.260	1.023	CN□□54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	0.984							

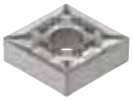
Applicable inserts **B20 ~ B25**

● : Stock item

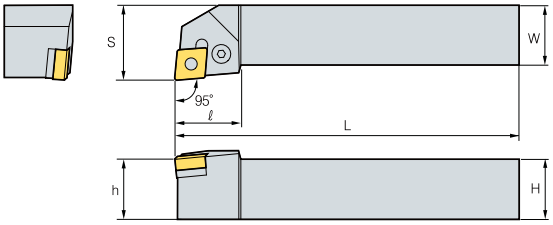
■ Improved holders and parts ensure performance and durability

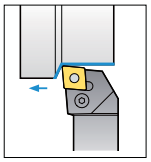
■ "N" stand for New type (Holders and parts)

PCLNR/L



CN□□





95°

• R type insert

(inch)

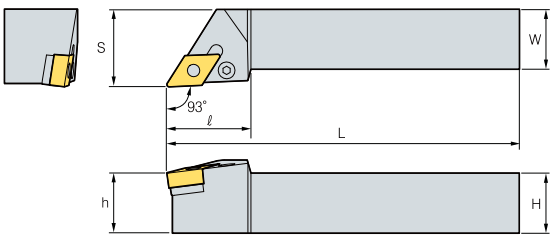
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PCLNR/L	10-3A	5/8	5/8	4	1.000	0.625	0.787	CN□□32□	LV3	VHX0617	SC32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.866							
	16-3D	1	1	6	1.250	1.000	0.866							
	10-4A	5/8	5/8	4	1.000	0.625	1.102	CN□□43□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.102							
	16-4D	1	1	6	1.250	1.000	1.102							
	85-4D	1 1/4	1	6	1.250	1.250	1.102							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.102							
	16-5D	1	1	6	1.250	1.000	1.299	CN□□54□	LV5	VHX0825	SC53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299							
	16-6D	1	1	6	1.250	1.000	1.496	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	85-6D	1 1/4	1	6	1.250	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.496							
	24-6D	1 1/2	1 1/2	6	2.000	1.500	1.496							
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.496							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.772							
	32-8G	2	2	8	2.500	2.000	1.772	CN□□86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	24-8E-5	1 1/2	1 1/2	7	2.000	1.500	1.772							
	32-8G-5	2	2	8	2.500	2.000	1.772	CN□□85□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
PCLNR/L	10-3AN	5/8	5/8	4	1.000	0.625	0.787	CN□□32□	LV3N	VHX0617N	SC32N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.866							
	16-3DN	1	1	6	1.250	1.000	0.866							
	10-4AN	5/8	5/8	4	1.000	0.625	1.102	CN□□43□	LV4N	VHX0817N / VHX0820N	SC42N	SP4N	HW30L	LSPS4
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.102							
	16-4DN	1	1	6	1.250	1.000	1.102							
	85-4DN	1 1/4	1	6	1.250	1.250	1.102							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.102							
	16-5DN	1	1	6	1.250	1.000	1.299	CN□□54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.299							

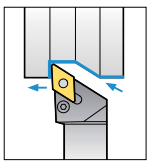
Applicable inserts **B20 ~ B25**

● : Stock item

PDJNR/L

DN□□





93°

• R type insert

(inch)

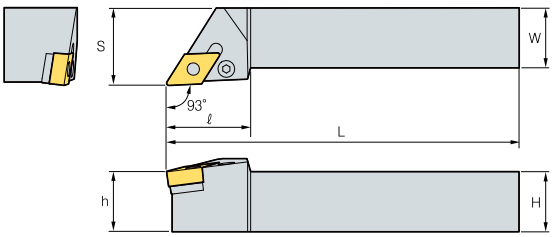
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PDJNR/L	10-3A	5/8	5/8	4	0.875	0.625	0.984	DN□□33□	LV3	VHX0617	SD317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.984							
	16-3D	1	1	6	1.250	1.000	1.181							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□44□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	0.984							
	85-4D	1 1/4	1	6	1.250	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□43□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D-3	1	1	6	1.250	1.000	1.378							
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.378							

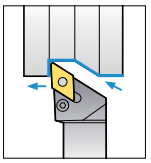
Applicable inserts **B26 ~ B31**

● : Stock item

PDJNR/L

DN□□





93°

• R type insert

(inch)

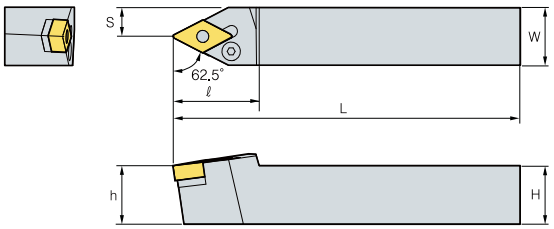
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PDJNR/L	**10-3AN**	5/8	5/8	4	0.875	0.625	0.984	DN□□33□	LV3AN	VHX0617N	SD32N	SP3N-1	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.984							
	16-3DN	1	1	6	1.250	1.000	1.181							
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	0.984							
	85-4DN	1 1/4	1	6	1.250	1.250	1.378							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3N	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□43□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	16-4D-3N	1	1	6	1.250	1.000	1.378							
	20-4D-3N	1 1/4	1 1/4	6	1.500	1.250	1.378							

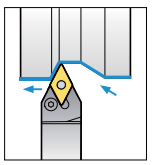
Applicable inserts **B26 ~ B31**

● : Stock item

PDNNR/L

DN□□





62.5°

• R type insert

(inch)

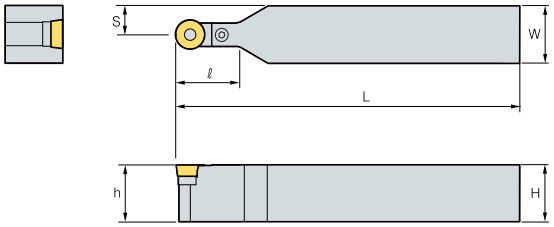
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PDNNR/L	**12-4B**	3/4	3/4	4 1/2	0.320	0.750	1.457	DN□□44□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.500	1.000	1.457							
	86-4D	1 1/2	1	6	0.500	1.500	1.457							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.457							
	16-4D-3	1	1	6	0.500	1.000	1.457	DN□□43□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	86-4D-3	1 1/2	1	6	0.500	1.500	1.457							
PDNNR/L	**12-4BN**	3/4	3/4	4 1/2	0.320	0.750	1.457	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.500	1.000	1.457							
	20-4DN	1 1/2	1	6	0.500	1.500	1.457							
	16-4D-3N	1	1	6	0.500	1.000	1.457	DN□□43□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	20-4D-3N	1 1/2	1	6	0.500	1.500	1.457							

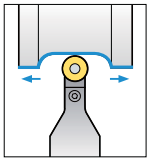
Applicable inserts **B26 ~ B31**

● : Stock item

PRDCN

RCMX





(inch)

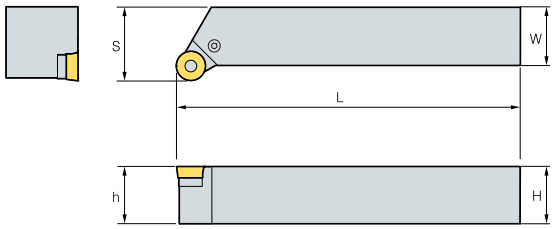
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PRDCN	**12-10D**	3/4	3/4	6	0.375	0.750	0.866	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	16-10D	1	1	6	0.689	1.000	0.945							
	16-12D	1	1	6	0.500	1.000	0.945	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	12-12C	3/4	3/4	5	0.630	0.750	0.945							
	85-12E	1 1/4	1	7	0.728	1.250	0.945							
	16-16E	1	1	7	0.807	1.000	1.181	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	85-16E	1 1/4	1	7	0.708	1.250	1.181							
	20-16E	1 1/4	1 1/4	7	0.945	1.250	1.378							
	20-20E	1 1/4	1 1/4	7	1.024	1.250	1.500	RCMX 2006M0	LR20	VHX0823	SR20	SP20	HW30L	LSPS5
	24-25E	1 1/2	1 1/2	7	1.250	1.500	1.653	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6
	24-25H	1 1/2	1 1/2	7	1.250	1.500	1.653							
	32-32H	2	2	7	1.500	2.000	2.047	RCMX 3209M0	LR32	VHX1236	SR32	SP8N	HW50L	LSPS8

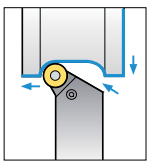
Applicable inserts **B63**

● : Stock item

PRGCR/L

RCMX





• R type insert

(inch)

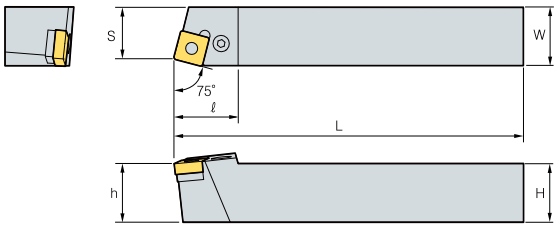
Designation		H	W	L	S	h	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PRGCR/L	**12-10B**	3/4	3/4	4 1/2	1.000	0.750	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	16-10D	1	1	6	1.250	1.000							
	12-12B	3/4	3/4	4 1/2	1.000	0.750	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	16-12D	1	1	6	1.250	1.000							
	85-12D	1 1/4	1	6	1.250	1.250							
	16-16D	1	1	6	1.250	1.000	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	85-16D	1 1/4	1	6	1.250	1.250							
	20-20D	1 1/4	1 1/4	6	1.500	1.250	RCMX 2006M0	LR20	VHX0823	SR20	SP20	HW30L	LSPS5
	24-25D	1 1/2	1 1/2	7	2.000	1.500	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6

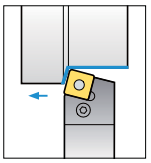
Applicable inserts **B63**

● : Stock item

PSBNR/L

SN□□





75°

• R type insert

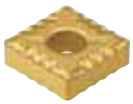
(inch)

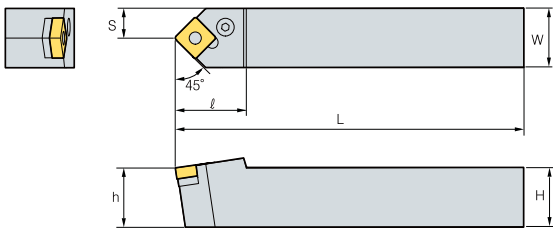
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PSBNR/L	**10-3A**	5/8	5/8	4	0.500	0.625	0.827	SN□□54□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	0.600	0.750	0.906							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.102	SN□□54□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.790	1.000	1.102							
	85-4D	1 1/4	1	6	0.790	1.250	1.102							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.102							
	16-5D	1	1	6	0.790	1.000	1.378	SN□□64□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.378							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.575	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	1.186	1.500	2.000	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	1.186	1.500	2.000	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E	2	2	8	1.382	2.000	2.000	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSBNR/L	**10-3AN**	5/8	5/8	4	0.500	0.625	0.827	SN□□54□	LV3N	VHX0617N	SS32N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	0.600	0.750	0.906							
	12-4BN	3/4	3/4	4 1/2	0.600	0.750	1.102	SN□□54□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.790	1.000	1.102							
	85-4DN	1 1/4	1	6	0.790	1.250	1.102							
	20-4DN	1 1/4	1 1/4	6	0.990	1.250	1.102							
	16-5DN	1	1	6	0.790	1.000	1.378	SN□□64□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0.990	1.250	1.378							

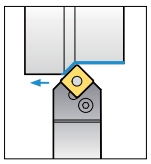
Applicable inserts **B33 ~ B40**

● : Stock item

PSDNN







45°

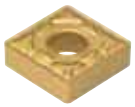
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PSDNN	**10-3A**	5/8	5/8	4	0.313	0.625	0.906	SN□□32□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.181	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.500	1.000	1.181							
	85-4D	1 1/4	1	6	0.500	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.575							
	16-5D	1 1/4	1 1/4	6	0.500	1.000	1.575	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	0..625	1.250	1.575							
	85-6D	1 1/4	1	6	0.500	1.250	1.575	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.575							
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	0.750	1.500	1.969	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E	2	2	8	1.000	2.000	1.969							
	24-8E-6	1 1/2	1 1/2	7	0.750	1.500	1.969	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E-6	2	2	8	1.000	2.000	1.969							
PSDNN	**10-3AN**	5/8	5/8	4	0.313	0.625	0.906	SN□□32□	LV3N	VHX0617N	SS32N	SP3N	HW25L	LSPS3
	12-4BN	3/4	3/4	4 1/2	0.375	0.750	1.181	SN□□43□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.500	1.000	1.181							
	85-4DN	1 1/4	1 1/4	6	0.500	1.250	1.181							
	20-4DN	1 1/4	1 1/4	6	0.625	1.250	1.575							
	16-5DN	1 1/4	1 1/4	6	0.500	1.000	1.575	SN□□54□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0..625	1.250	1.575							

Applicable inserts **B36 ~ B40**

● : Stock item

PSKNR/L



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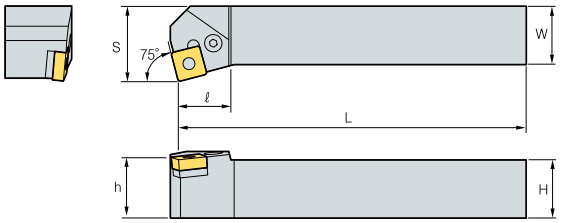
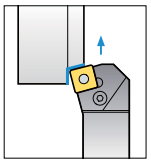




75°

• R type insert

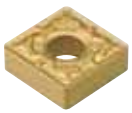
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PSKNR/L	10-3A	5/8	5/8	4	0.750	0.625	0.669	SN□□32□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.024	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	1.024							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.024							
	16-5D	1	1	6	1.250	1.000	1.260	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.260							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.417	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.732	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	2.000	1.500	1.732	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E-6	2	2	8	2.500	2.000	1.476	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSKNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.669	SN□□32□	LV3N	VHX0617N	SS32N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787							
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.024	SN□□43□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	1.024							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.024							
	16-5DN	1	1	6	1.250	1.000	1.260	SN□□54□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.260							

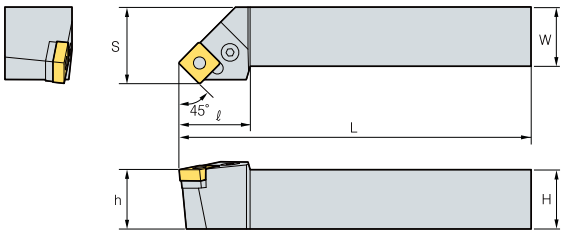
Applicable inserts **B33 ~ B40**

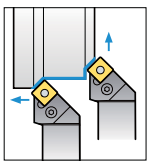
● : Stock item

PSSNR/L



SN□□





45°

• R type insert

(inch)

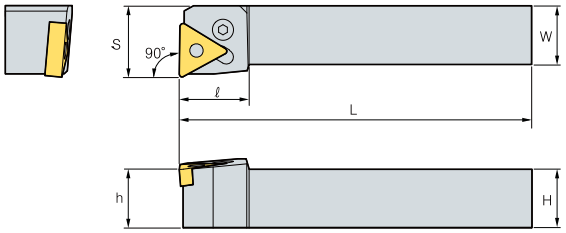
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PSSNR/L	10-3A	5/8	5/8	4	0.750	0.625	0.984	SN□□32□	LV3	VHX0617	SS32	SP10	HW25L	LSPS3
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.181	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	1.417							
	85-4D	1 1/4	1	6	1.250	1.250	1.772							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.575	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	16-5D	1	1	6	1.250	1.000	1.417							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.772	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.772							
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.969							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.969	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	2.000	1.500	1.969	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSSNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.984	SN□□32□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.181	SN□□43□	LV4N	VHX0821N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	1.417							
	85-4DN	1 1/4	1	6	1.500	1.000	1.417							
	20-4DN	1 1/4	1 1/4	6	1.250	1.000	1.772							
	16-5DN	1	1	6	1.500	1.250	1.575	SN□□54□	LV5N	VHX08209N	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.250	1.000	1.417							

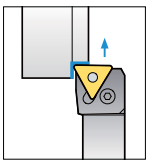
Applicable inserts **B33 ~ B40**

● : Stock item

PTFNR/L

TN□□





90°
• R type insert
(inch)

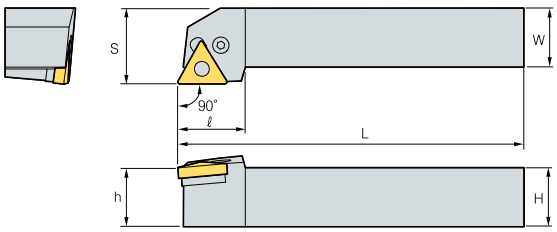
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PTFNR/L	**10-3A**	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3D	1	1	6	1.250	1.000	0.787							
	16-4D	1	1	6	1.250	1.000	0.984	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	20-4D	1 1/4	1 1/4	6	1.500	1.250	0.984							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.339	TN□□54□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.339							
PTFNR/L	**10-3AN**	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3DN	1	1	6	1.250	1.000	0.787							
	16-4DN	1	1	6	1.250	1.000	0.984	TN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	0.984							
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.339	TN□□54□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	1.339							

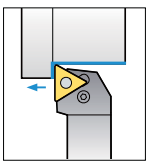
Applicable inserts **B41 ~ B48**

● : Stock item

PTGNR/L

TN□□





90°
• R type insert
(inch)

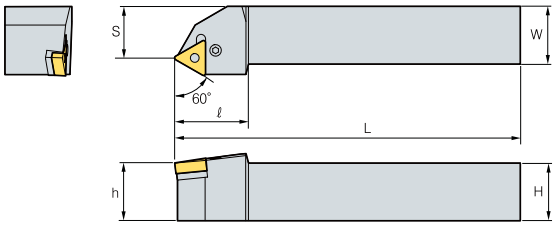
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PTGNR/L	**08-2K**	1/2	1/2	3 3/20	0.625	0.500	0.630	TN□□21.5□	LV2	VHX0509B	-	-	HW20L	-
	10-2A	5/8	5/8	4	0.750	0.625	0.709							
	12-2B	3/4	3/4	41/2	0.100	0.750	0.748							
	16-2D	1	1	6	1.250	1.000	0.787							
	10-3A	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3D	1	1	6	1.250	1.000	0.787							
	20-3D	1 1/4	1 1/4	6	1.500	1.250	0.787							
	16-4D	1	1	6	1.250	1.000	1.102	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.102							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299	TN□□54□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.299							
PTGNR/L	**10-3AN**	5/8	5/8	4	0.750	0.625	0.709	TN□□33□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	41/2	0.100	0.750	0.748							
	16-3DN	1	1	6	1.250	1.000	0.787							
	20-3DN	1 1/4	1 1/4	6	1.500	1.250	0.787							
	16-4DN	1	1	6	1.250	1.000	1.102	TN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.102							
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.299	TN□□54□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	1.299							

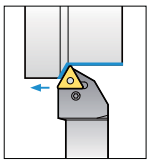
Applicable inserts **B41 ~ B48**

● : Stock item

PTTNR/L

TN□□





60°

• R type insert

(inch)

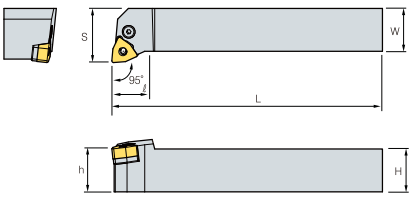
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch
PTTNR/L	**10-3A**	5/8	5/8	4	0.511	0.625	0.984	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	0.669	0.750	0.984							
	16-3D	1	1	6	0.866	1.000	1.260							
	16-4D	1	1	6	0.866	1.000	1.260	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
PTTNR/L	**10-3AN**	5/8	5/8	4	0.511	0.625	0.984	TN□□33□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	0.669	0.750	0.984							
	16-3DN	1	1	6	0.866	1.000	1.260							
	16-4DN	1	1	6	0.866	1.000	1.260	TN□□43□						

Applicable inserts **B41 ~ B48**

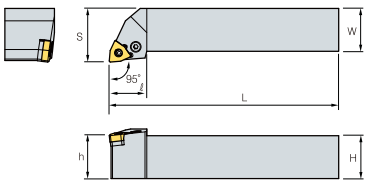
● : Stock item

PWLNR/L

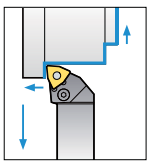
WN□□



[Fig.1]



[Fig.2]



95°

• R type insert

(inch)

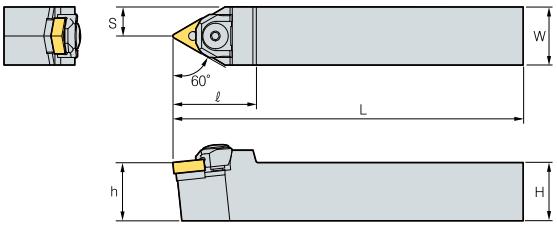
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	ShimPin Punch	Fig
PWLNR/L	**10-3A**	5/8	5/8	4	0.750	0.625	0.787	WN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3	1
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787								
	16-3D	1	1	6	1.250	1.000	0.787								
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.024	WN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4	2
	16-4D	1	1	6	1.250	1.000	1.024								
PWLNR/L	**10-3AN**	5/8	5/8	4	0.750	0.625	0.787	WN□□33□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3	1
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787								
	16-3DN	1	1	6	1.250	1.000	0.787								
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.024	WN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4	2
	16-4DN	1	1	6	1.250	1.000	1.024								

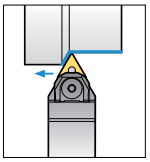
Applicable inserts **B51 ~ B54**

● : Stock item

WTENN

TN□□





60°

• R type insert

(inch)

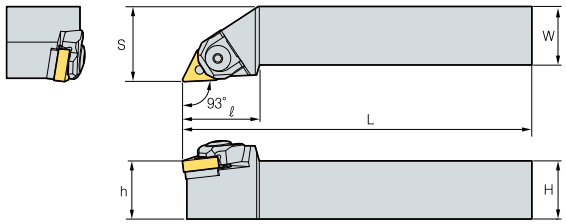
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	StopperRing	Shim	Shim Pin	Nut	Wrench
WTENN	**12-3C**	3/4	3/4	5	0.375	0.750	1.417	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	16-3D	1	1	6	0.500	1.000	1.417								
	16-4D	1	1	6	0.500	1.000	1.654	TN□□43□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	20-4E	1 1/4	1 1/4	7	0.625	1.250	1.654								

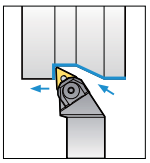
Applicable inserts **B41 ~ B48**

● : Stock item

WTJNR/L

TN□□





93°

• R type insert

(inch)

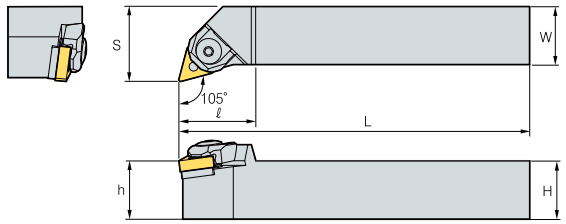
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	StopperRing	Shim	Shim Pin	Nut	Wrench
WTJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.299	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	16-3D	1	1	6	1.250	1.000	1.299								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.299								
	16-4D	1	1	6	1.250	1.000	1.387	TN□□43□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.387								

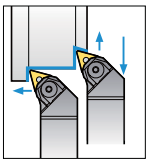
Applicable inserts **B41 ~ B48**

● : Stock item

WTXNR/L

TN□□





105°

• R type insert

(inch)

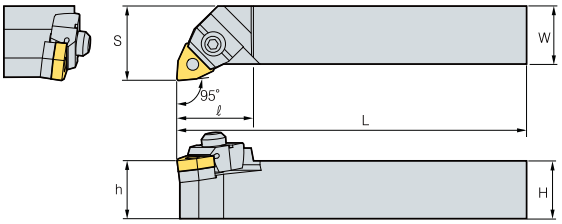
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	StopperRing	Shim	Shim Pin	Nut	Wrench
WTXNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.181	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW25L / HW30L
	16-3D	1	1	6	1.250	1.000	1.299								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.299								

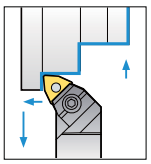
Applicable inserts **B41 ~ B48**

● : Stock item

WWLNR/L

WN□□





95°

• R type insert

(inch)

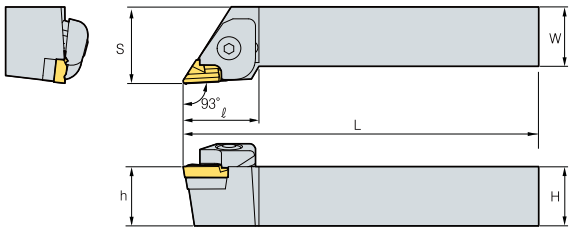
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	C-Ring	Shim	Shim Pin	Nut	Wrench
WWLNR/L	**12-4B**	3/4	3/4	4 1/2	1.000	0.750	1.260	WN□□43□	CMH6R/L3	MHX0630	CR05	SW43M	SP2M	N0508	HW30L
	16-4D	1	1	6	1.250	1.000	1.299		CMH6R2				SP4M		HW40L
	20-4F	1 1/4	1 1/4	6	1.500	1.250	1.299		CMH6R2						

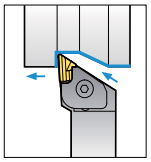
Applicable inserts **B51 ~ B54**

● : Stock item

CKJNR/L

KN□□





93°

• R type insert

(inch)

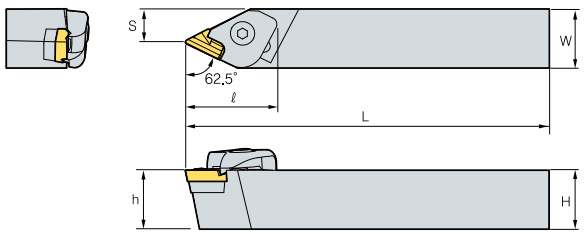
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKJNR	**12-3B**	3/4	3/4	4 1/2	1.120	0.750	1.260	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 / SR4	SHX0310	HW20L HW40L
	16-3D	1	1	6	1.250	1.000	1.260								
	85-3D	1 1/4	1	6	1.250	1.250	1.260								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.260								
	24-3E	1 1/2	1 1/2	7	2.000	1.500	1.260								
CKJNL	**12-3B**	3/4	3/4	4 1/2	1.120	0.750	1.260	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 / SR4	SHX0310	HW20L HW40L
	16-3D	1	1	6	1.250	1.000	1.260								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.260								
	24-3E	1 1/2	1 1/2	7	2.000	1.500	1.260								

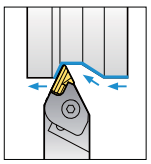
Applicable inserts **B32**

● : Stock item

CKNNR/L

KN□□





62.5°

• R type insert

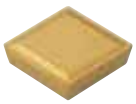
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKNNR	**16-3D**	1	1	6	0.570	1.000	1.457	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 / SR4	SHX0310	HW20L HW40L
	20-3D	1 1/4	1 1/4	6	0.660	1.250	1.457								
CKNNL	**16-3D**	1	1	6	0.570	1.000	1.457	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 / SR4	SHX0310	HW20L HW40L
	20-3D	1 1/4	1 1/4	6	0.660	1.250	1.457								

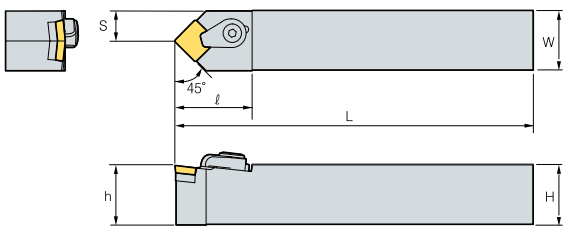
Applicable inserts **B32**

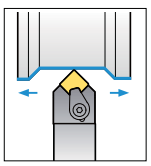
● : Stock item

CSDPN



SP□R





45°

• R type insert

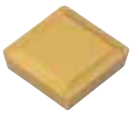
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	C-Ring	Wrench
CSDPN	**10-3A**	5/8	5/8	4	0.3125	0.625	1.181	SP□R 32□	CH53R1	CH0515C	SS32C	SP3C	CR03C	HW25L
	16-4D	1	1	6	0.5000	1.000	1.378	SP□R 42□	CH6R5	CHX0622C	SS42C	SP3C	CR04C	HW30L

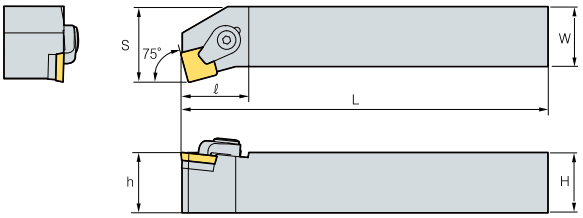
Applicable inserts **B65 ~ B66**

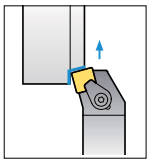
● : Stock item

CSKPR/L



SP□R





75°

• R type insert

(inch)

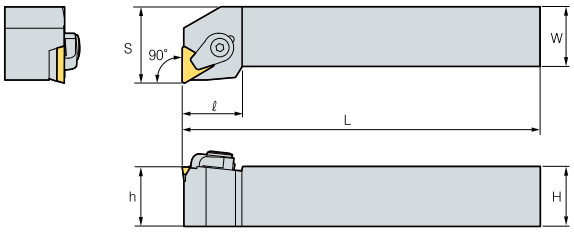
Designation	H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	C-Ring	Wrench
CSKPR/L **16-4D**	1	1	6	1.250	0.750	1.260	SP□R42□	CH6RO	CHX0622C	SS42C	SP3C	CR04C	HW30L

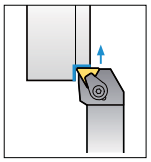
Applicable inserts **B65 ~ B66**

● : Stock item

CTFPR/L

TP□R





90°

• R type insert

(inch)

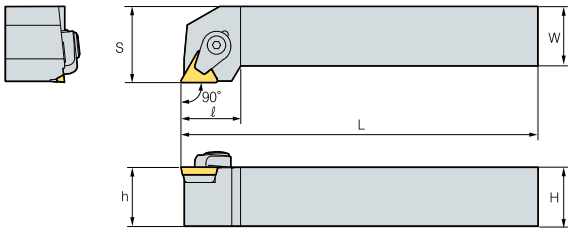
Designation	H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	C-Ring	Wrench
CTFPR/L **12-4B**	3/4	3/4	4 1/2	1.000	0.750	1.260	TP□R32□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
16-4D	1	1	6	1.250	1.000	1.260							

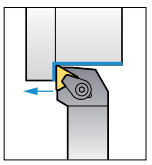
Applicable inserts **B70 ~ B72**

● : Stock item

CTGPR/L

TP□R





90°

• R type insert

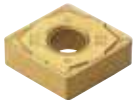
(inch)

Designation	H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	C-Ring	Wrench
CTGPR/L **08-2K**	1/2	1/2	3 1/8	0.625	0.500	0.787	TP□R22□	CH53R1	CHX0515C	-	-	CR03C	HW25L
10-2K	5/8	5/8	3 1/8	0.750	0.625	0.787							
12-2B	5/8	5/8	4	0.750	0.625	0.787							
12-3B	3/4	3/4	4 1/2	1.000	0.750	0.984	TP□R32□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
16-3D	1	1	6	1.250	1.000	0.984							
16-4D	1	1	6	1.250	1.000	1.260	TP□R43□	CH83R1	CHX0823C	ST43C	SP4C	CR05C	HW40L
20-4D	1 1/4	1 1/4	7	1.500	1.250	1.260							

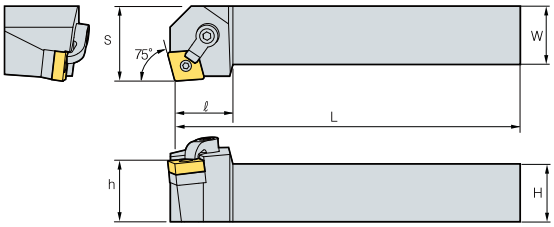
Applicable inserts **B70 ~ B72**

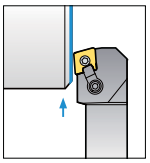
● : Stock item

MCKNR/L



CN□□





75°

• R type insert

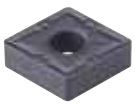
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MCKNR/L	**12-4B**	3/4	3/4	4 1/2	1.000	0.750	1.250	CN□□R42□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	20-4D	1 1/4	1 1/4	6	1.400	1.250	1.250						

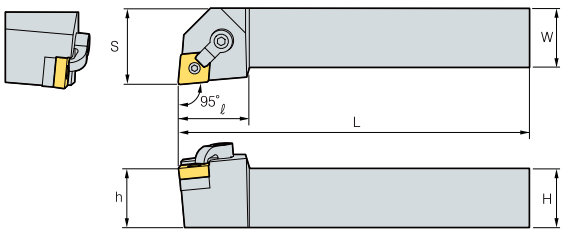
Applicable inserts **B20 ~ B25**

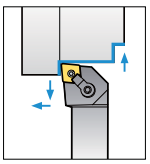
● : Stock item

MCLNR/L



CN□□





95°

• R type insert

(inch)

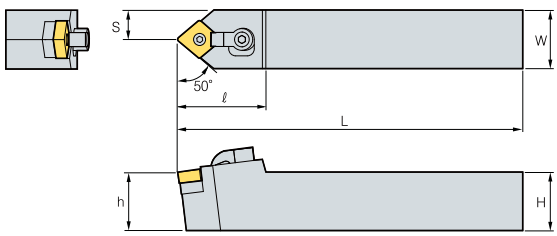
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MCLNR/L	**10-3A**	5/8	5/8	4	0.875	0.625	1.000	CN□□32□	CDH7N	DHA10-32-19	SC32D	SP3DS	HW23.8L HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.000						
	16-3C	1	1	5	1.250	1.000	1.000						
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.250	CN□□43□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	85-4D	1	1 1/4	6	1.250	1.250	1.250						
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	16-5D	1	1	6	1.250	1.000	1.299	CN□□54□	CDH8N	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299						
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.299						
	16-6D	1	1	6	1.250	1.000	1.102	CN□□64□	CDH8N	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.102						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.102						
	26-8E	1 1/2	1 1/2	7	2.000	1.500	1.102	CN□□85□	CDH8N3	DHA3/8-35	SC84D	SP8D	HW39.7L HW47.6L

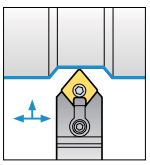
Applicable inserts **B20 ~ B25**

● : Stock item

MCMNN

CN□□





50°

• R type insert

(inch)

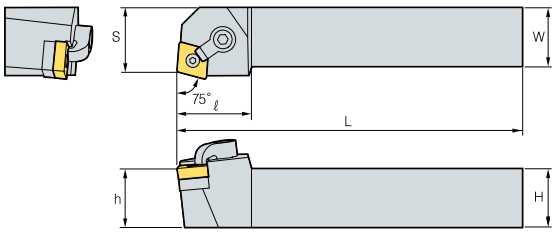
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MCMNN	**12-4B**	1 1/4	1 1/4	4 1/2	0.375	0.750	1.250	CN□□43□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	0.500	1.000	1.250						
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.250						
	16-5D	1	1	6	0.500	1.000	1.500	CN□□54□	CDH8N	DHA5/16-32	SC53S	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.500						
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.500	CN□□64□	CDH8N	DHA5/16-32	SD63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.728						

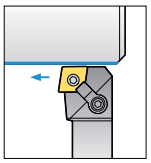
Applicable inserts **B20 ~ B25**

● : Stock item

MCRNR/L

CN□□





75°

• R type insert

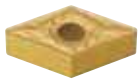
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MCRNR/L	12-4B	3/4	3/4	4 1/2	0.751	0.750	1.250	CN□□43□	CDH8N1	DHA5/16-32	SC43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	1.251	1.000	1.250						
	16-5D	1	1	6	1.251	1.000	1.299	CN□□54□	CDH8N1	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299						
	20-6D	1 1/4	1 1/4	6	1.501	1.250	1.514	CN□□64□	CDH8N1	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	2.001	1.500	1.514						

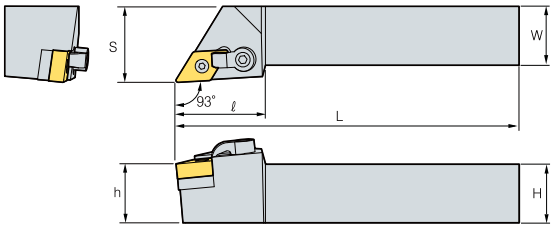
Applicable inserts **B20 ~ B25**

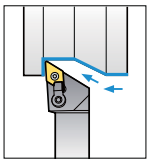
● : Stock item

MDJNR/L



DN□□





93°

• R type insert

(inch)

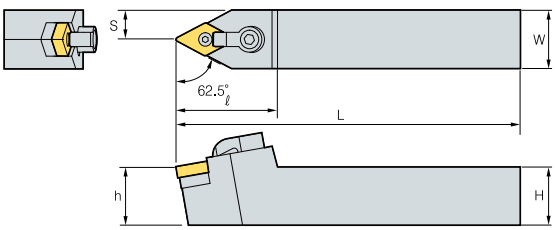
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MDJNR/L	12-3B	1 1/4	1 1/4	4 1/2	1.000	0.750	1.250	DN□□33□	CDH6N	DHA1/4-19	SD32D	SP3D	HW31.8L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.420	DN□□43□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L HW23.8L
	16-4B-3	1	1	4 1/2	1.250	1.000	1.420						
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.420						
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.420	DN□□42□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.420						
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.420						

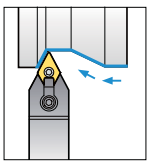
Applicable inserts **B26 ~ B31**

● : Stock item

MDNNN

DN□□





62.5°

(inch)

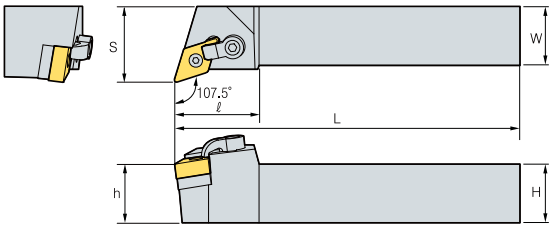
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MDNNN	16-4D-3	1	1	6	0.500	1.000	1.614	DN□□43□	CDH8N	DHA5/16-32	SD43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	0.500	1.000	1.614	DN□□44□	CDH8N	DHA5/16-32	SD43D	SP4DL	HW39.7L HW23.8L

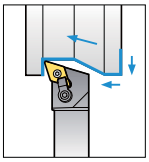
Applicable inserts **B26 ~ B31**

● : Stock item

MDQNR/L

DN□□





107.5°

• R type insert

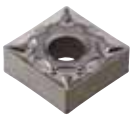
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MDQNR/L	**16-4D**	1	1	6	1.250	0.750	1.614	DN□□44□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.000	1.614						HW23.8L
	16-4D-3	1	1	6	1.250	0.750	1.614	DN□□43□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L
	20-4D-3	1 1/4	1 1/4	6	1.500	1.000	1.614						HW23.8L

Applicable inserts **B26 ~ B31**

● : Stock item

MSBNR/L



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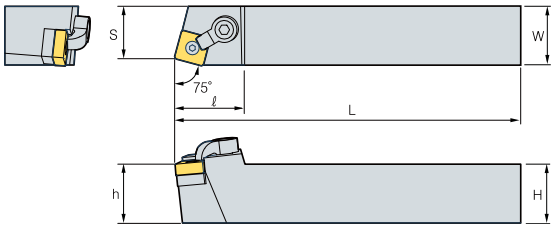
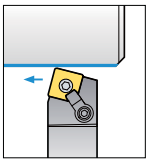




75°

• R type insert

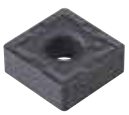
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MSBNR/L	**12-4B**	3/4	3/4	4 1/2	0.669	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
	16-4D	1	1	6	0.866	1.000	1.250						HW23.8L
	16-5D	1	1	6	0.866	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
	20-5D	1 1/4	1 1/4	6	0.866	1.250	1.378						HW31.8L
	20-6D	1 1/4	1 1/4	6	1.063	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
	24-6E	1 1/2	1 1/2	7	1.378	1.500	1.500						HW35.7L

Applicable inserts **B33 ~ B40**

● : Stock item

MSDNN



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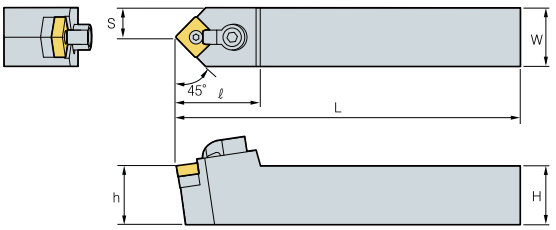
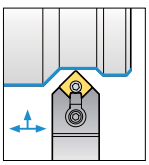




45°

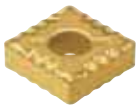
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MSDNN	**10-3A**	5/8	5/8	4	0.313	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
	12-3B	3/4	3/4	4 1/2	0.375	0.750	1.102						HW23.8L
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
	16-4D	1	1	6	0.500	1.000	1.250						HW23.8L
	85-4D	1 1/4	1	6	0.500	1.250	1.250						
	16-5D	1	1	6	0.500	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
	85-5D	1 1/4	1	6	0.500	1.250	1.378						
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.378						HW31.8L
	24-5E	1 1/2	1 1/2	7	0.750	1.500	1.378						
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.728	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.728						HW35.7L

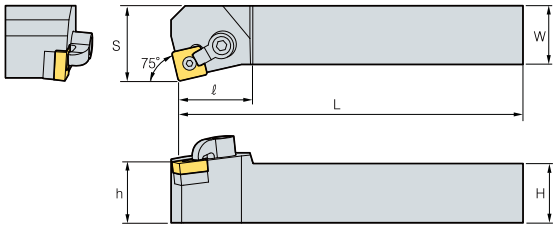
Applicable inserts **B33 ~ B40**

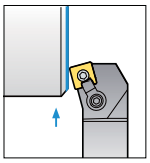
● : Stock item

MSKNR/L



SN□□





75°

• R type insert

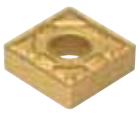
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MSKNR/L	**10-3A**	5/8	5/8	4	0.875	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.102						HW23.8L
	12-4D	3/4	3/4	6	1.000	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
	16-4D	1	1	6	1.250	1.000	1.250						HW23.8L
	85-4D	1 1/4	1	6	1.250	1.250	1.250						
	16-5D	1	1	6	1.250	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
	20-5D	1 1/4	1 1/4	6	1.250	1.250	1.378						HW31.8L
	20-6D	1 1/4	1 1/4	6	1.250	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500						HW35.7L
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.500	SN□□85□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

Applicable inserts **B33 ~ B40**

● : Stock item

MSRNR/L



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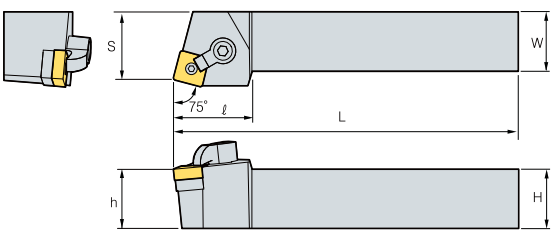
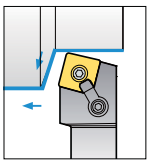




75°

• R type insert

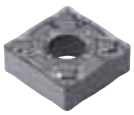
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MSRNR/L	**10-3A**	5/8	5/8	4	0.738	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
	12-3B	3/4	3/4	4 1/2	0.878	0.750	1.102						HW23.8L
	12-4B	3/4	3/4	4 1/2	0.878	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
	16-4D	1	1	6	1.128	1.000	1.250						HW23.8L
	16-5D	1	1	6	1.100	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
	20-5D	1 1/4	1 1/4	6	1.350	1.250	1.378						HW31.8L
	85-6D	1 1/4	1	6	1.068	1.250	1.500						
	20-6D	1 1/4	1 1/4	6	1.318	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
	24-6E	1 1/2	1 1/2	7	1.818	1.500	1.500						HW35.7L
	24-8E	1 1/2	1 1/2	7	1.762	1.500	1.500	SN□□85□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

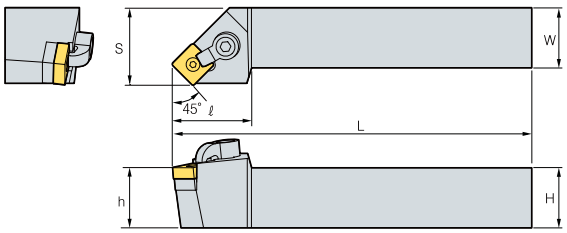
Applicable inserts **B33 ~ B40**

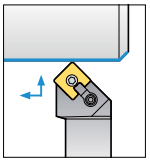
● : Stock item

MSSNR/L



SN□□





45°

• R type insert

(inch)

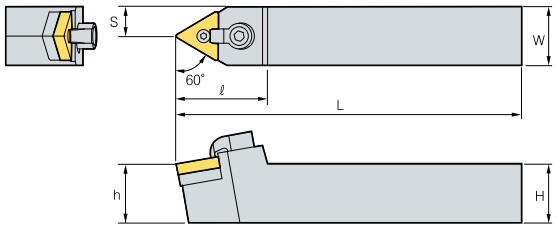
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MSSNR/L	10-3A	5/8	5/8	4	0.516	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
	12-3B	3/4	3/4	4 1/2	0.641	0.750	1.102						HW23.8L
	12-4B	3/4	3/4	4 1/2	0.662	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
	16-4D	1	1	6	0.912	1.000	1.250						HW23.8L
	16-5D	1	1	6	0.828	1.000	1.378	SN□□54□	CDH8N1	DHA5/16-32	SS53D	SP5D	HW39.7L
	20-5D	1 1/4	1 1/4	6	1.078	1.250	1.378						HW31.8L
	20-6D	1 1/4	1 1/4	6	0.992	1.250	1.500	SN□□64□	CDH8N1	DHA5/16-32	SS63D	SP6D	HW39.7L
	24-6	1 1/2	1 1/2	7	1.492	1.500	1.500						HW35.7L

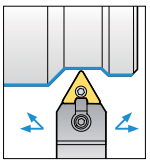
Applicable inserts **B33 ~ B40**

● : Stock item

MTENN

TN□□





60°

(inch)

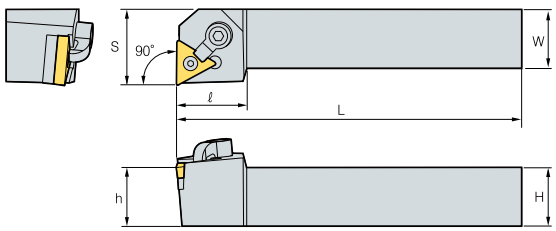
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MTENN	12-3B	3/4	3/4	4 1/2	0.375	0.750	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L
	16-3D	1	1	6	0.500	1.000	1.250						HW19.8L
	16-4D	1	1	6	0.500	1.000	1.378	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L
													HW23.8L
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L
													HW31.8L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L
													HW35.7L

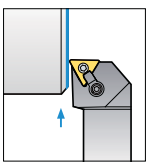
Applicable inserts **B41 ~ B48**

● : Stock item

MTFNR/L

TN□□





90°

• R type insert

(inch)

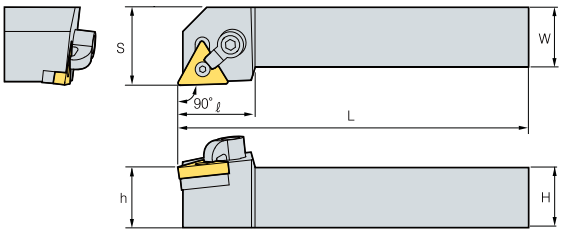
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MTFNR/L	10-3A	5/8	5/8	4	0.875	0.625	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250						HW19.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						HW23.8L
	24-4E	1 1/2	1 1/2	7	2.000	1.500	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.378						HW31.8L
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L
													HW35.7L

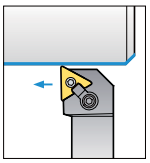
Applicable inserts **B41 ~ B48**

● : Stock item

MTGNR/L

TN□□





90°

• R type insert

(inch)

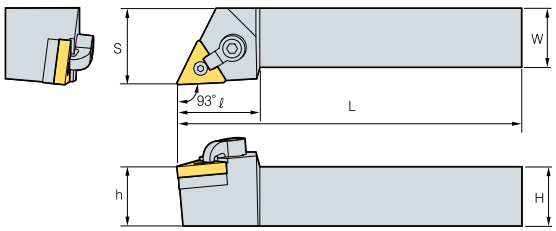
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MTGNR/L	**10-3A**	5/8	5/8	4	0.875	0.625	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250						
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.378						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

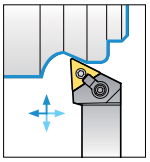
Applicable inserts **B41 ~ B48**

● : Stock item

MTJNR/L

TN□□





93°

• R type insert

(inch)

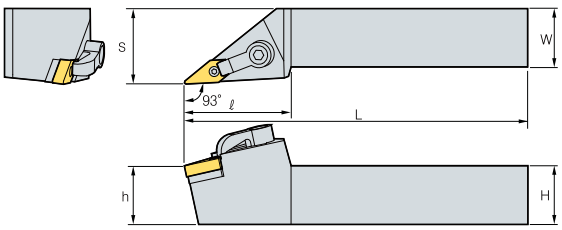
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MTJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-5E	1 1/2	1 1/2	7	2.000	1.250	1.378						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

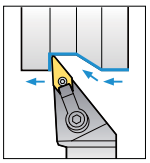
Applicable inserts **B41 ~ B48**

● : Stock item

MVJNR/L

VN□□





93°

• R type insert

(inch)

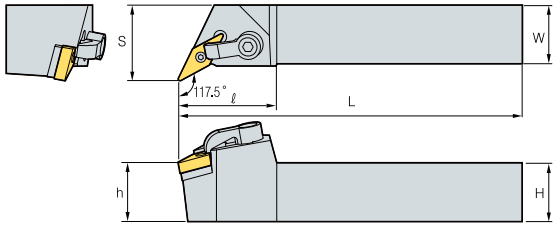
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew		Shim Pin	Wrench
MVJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.467	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.467						
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.467						
	16-4D	1	1	6	1.250	1.000	2.000	VN□□43□	CDH8N2	DHA5/16-32	SV43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	2.000						
	24-4E	1 1/2	1 1/2	7	2.000	1.500	2.000						

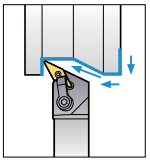
Applicable inserts **B49 ~ B50**

● : Stock item

MVQNR/L

VN□□





117.5°

• R type insert

(inch)

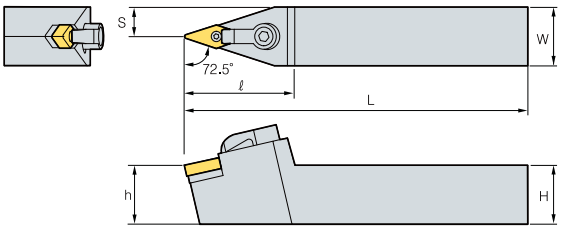
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MVQNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.467	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.467						
	20-3D	1 1/4	1 1/4	6	1.500	1.500	1.467						

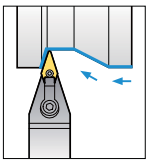
Applicable inserts **B49 ~ B50**

● : Stock item

MVVNN

VN□□





72.5°

(inch)

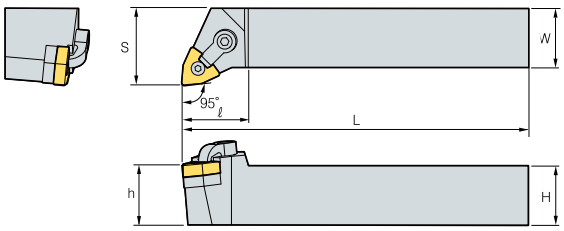
Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MVVNN	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.728	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.728						

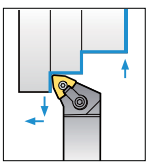
Applicable inserts **B49 ~ B50**

● : Stock item

MWLNR/L

WN□□





95°

• R type insert

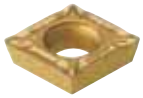
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Pin	Wrench
MWLNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.250	WN□□33□	CDH7N	DHA10-32-19	SW32D	SP3D	HW19.8L HW23.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	20-3D	11/4	11/4	6	1.500	1.250	1.250						
	12-4B	3/4	3/4	4 1/2	1.000	1.750	1.250	WN□□43□	CDH6N	DHA1/4-21	SW43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	20-4D	11/4	11/4	6	1.500	1.250	1.250						

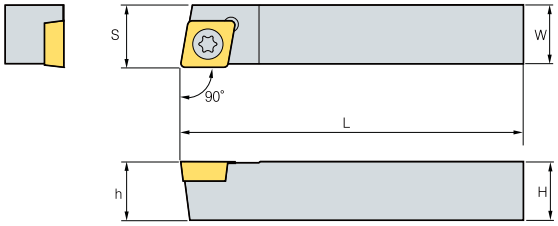
Applicable inserts **B51 ~ B54**

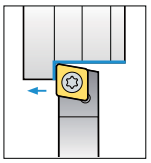
● : Stock item

SCACR/L



CC□□





90°

• R type insert

(inch)

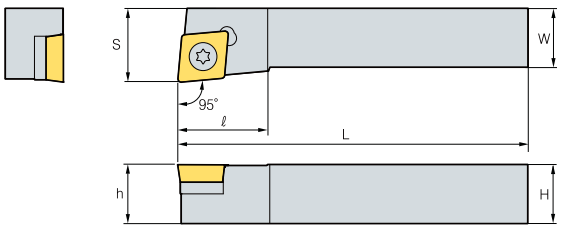
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SCACR/L	**06-2J**	3/8	3/8	2 3/4	0.375	0.375	CC□T21.5□	FTKA02565	-	-	TW07P
	08-3K	1/2	1/2	3 1/8	0.500	0.500	CC□T32.5□	FTKA03508	-	-	TW15P

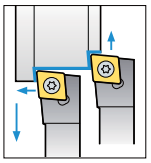
Applicable inserts **B55 ~ B58, B80**

● : Stock item

SCLCR/L

CC□□





95°

• R type insert

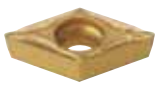
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SCLCR/L	**05-2I**	5/16	5/16	2 1/2	0.375	0.3125	0.394	CC□T21.5□	FTKA02565	-	-	TW07P
	06-2J	3/8	3/8	2 3/4	0.500	0.375	0.394					
	08-3K	1/2	1/2	3 1/8	0.625	0.500	0.630	CC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.750	0.625	0.630					
	12-3C	3/4	3/4	5	1.000	0.750	0.630					
	16-3D	1	1	6	1.250	1.000	1.024	CC□T43□	FTGA0411F	SC42S	SHXN0610F	TW15P HW40L
	12-4B	3/4	3/4	4 1/2	1.000	0.750	0.984					
	16-4D	1	1	6	1.250	1.000	1.024					

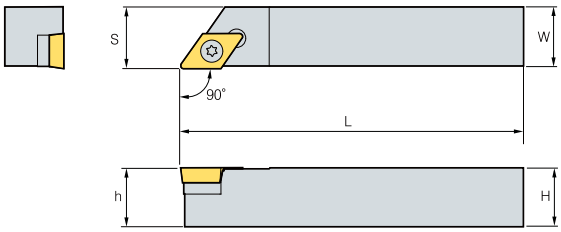
Applicable inserts **B55 ~ B58, B80**

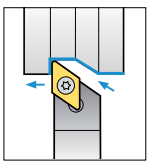
● : Stock item

SDACR/L



DC□□





90°

• R type insert

(inch)

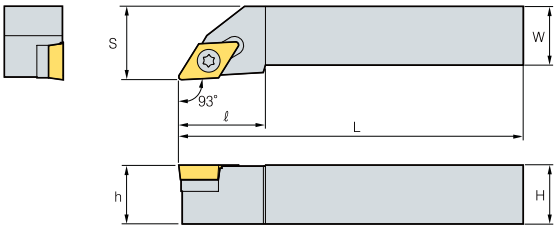
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SDACR/L	**06-2J**	3/8	3/8	2 3/4	0.375	0.375	DC□T21.5□	FTKA02565	-	-	TW07P
	08-3K	1/2	1/2	3 1/8	0.500	0.500	DC□T32.5□	FTKA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.625	0.625		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L

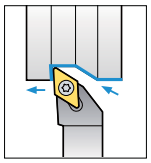
Applicable inserts **B60 ~ B62, B81**

● : Stock item

SDJCR/L

DC□□





93°

• R type insert

(inch)

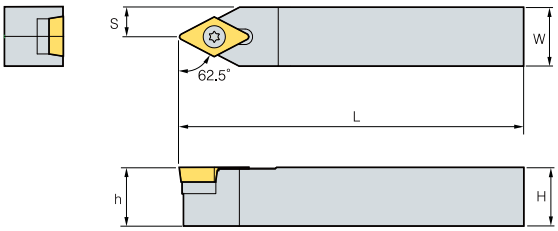
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SDJCR/L	**06-2J**	3/8	3/8	2 3/4	0.500	0.375	0.591	DC□T21.5□	FTKA02565	-	-	TW07P
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.591					
	10-2A	5/8	5/8	4	0.750	0.625	0.709					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	0.787					
	08-3K	1/2	1/2	3 1/8	0.625	0.500	0.591	DC□T32.5□	FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
	10-3A	5/8	5/8	4	0.750	0.625	0.945					
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.945					
	16-3D	1	1	6	1.250	1.000	1.142					
	16-4D	1	1	6	1.250	1.000	1.417	DC□T43□	FTGA0411F	SD42S	SHXN0610F	TW15P, HW40L

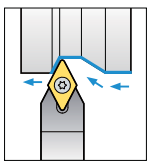
Applicable inserts **B60 ~ B62, B81**

● : Stock item

SDNCN

DC□□





62.5°

(inch)

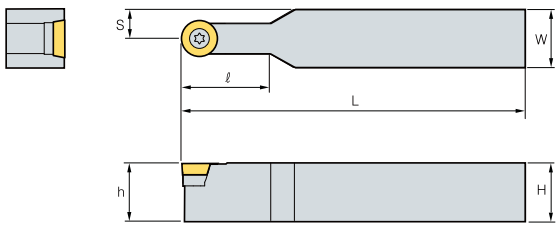
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SDNCN	**06-2J**	3/8	3/8	2 3/4	0.185	0.375	DC□T21.5□	FTKA02565	-	-	TW07P
	08-2K	1/2	1/2	3 1/8	0.250	0.500					
	08-3A	1/2	1/2	4	0.250	0.500	DC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.313	0.625	DC□T32.5□	FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					

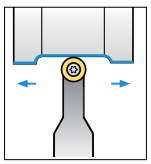
Applicable inserts **B60 ~ B62, B81**

● : Stock item

SRDCN

RCGT





(inch)

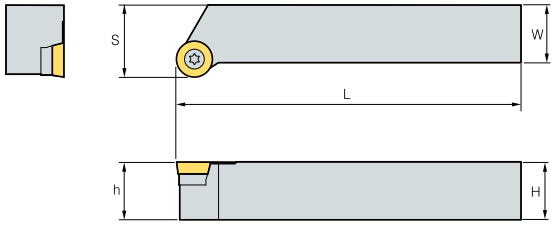
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SRDCN	**06-06J**	3/8	3/8	2 3/4	0.200	0.375	0.394	RC□T 21.5M0	FTKA02565	-	-	TW07P
	08-06K	1/2	1/2	3 1/8	0.236	0.500	0.472					
	10-06A	5/8	5/8	4	0.315	0.625	0.472					
	16-06D	1	1	6	0.500	0.984	0.787					
	10-08A	5/8	5/8	4	0.315	0.630	0.630	RC□T 2.52M0	FTNA0307	-	-	TW09P
	12-08B	3/4	3/4	4 1/2	0.375	0.787	0.787					
	16-08D	1	1	6	0.500	0.984	0.787					
	10-10A	5/8	5/8	4	0.315	0.630	0.984	RC□T 32M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	12-10B	3/4	3/4	4 1/2	0.375	0.787	0.984					
	16-10D	1	1	6	0.500	0.984	0.984					
	12-12B	3/4	3/4	4 1/2	0.375	0.787	1.102	RC□T 43M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	16-12D	1	1	6	0.500	0.984	1.102					

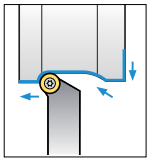
Applicable inserts **B82**

● : Stock item

SRGCR/L

RCGT





• R type insert

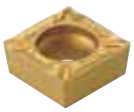
(inch)

Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SRGCR/L	**06-06J**	3/8	3/8	2 3/4	0.500	0.375	RC□T 21.5M0	FTKA02565	-	-	TW07P
	08-06K	1/2	1/2	3 1/8	0.625	0.500					
	10-06A	5/8	5/8	4	0.750	0.625					
	10-08A	5/8	5/8	4	0.750	0.630	RC□T 2.52M0	FTNA0307	-	-	TW09P
	12-08B	3/4	3/4	4 1/2	1.000	0.787					
	16-08D	1	1	6	1.250	0.984					
	10-10A	5/8	5/8	4	0.750	0.630	RC□T 32M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	12-10B	3/4	3/4	4 1/2	1.000	0.787					
	16-10D	1	1	6	1.250	0.984					
	12-12B	3/4	3/4	4 1/2	1.000	0.787	RC□T 43M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	16-12D	1	1	6	1.250	0.984					

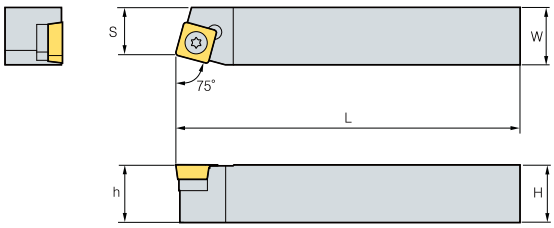
Applicable inserts **B82**

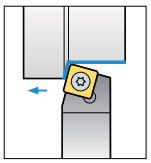
● : Stock item

SSBCR/L



SC□□





75°

• R type insert

(inch)

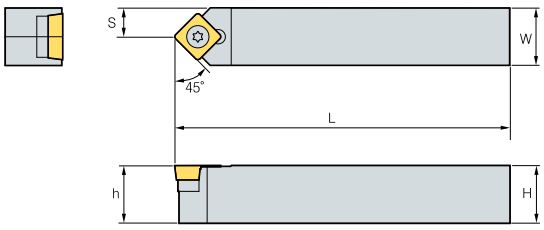
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SSBCR/L	**08-3K**	1/2	1/2	3 1/8	0.450	0.500	SC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.500	0.625		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
	12-4B	3/4	3/4	4 1/2	0.600	0.750	SC□T43□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

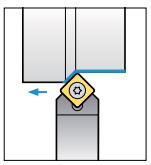
Applicable inserts **B63, B83**

● : Stock item

SSDCN

SC□□





45°

(inch)

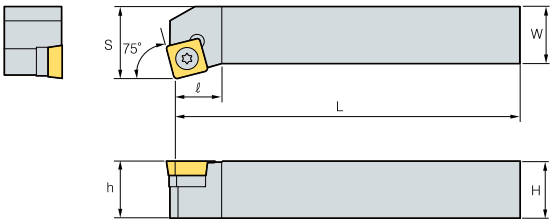
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SSDCN	**08-3K**	1/2	1/2	3 1/8	0.250	0.500	SC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.313	0.625		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

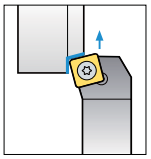
Applicable inserts **B63, B83**

● : Stock item

SSKCR/L

SC□□





75°

• R type insert

(inch)

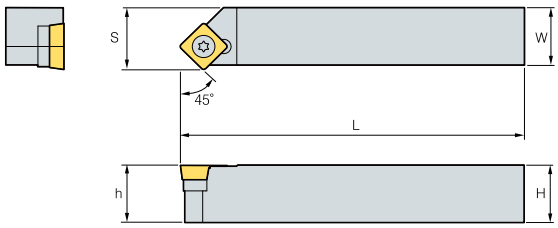
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SSKCR/L	10-3A	5/8	5/8	4	0.750	0.625	0.512	SC□T32.5□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

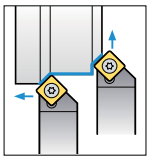
Applicable inserts **B63, B83**

● : Stock item

SSSCR/L

SC□□





45°

• R type insert

(inch)

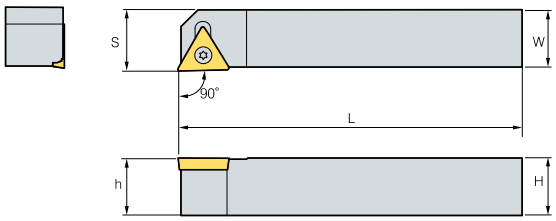
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SSSCR/L	10-3A	5/8	5/8	4	0.670	0.625	SC□T32.5□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
	12-4B	3/4	3/4	4 1/2	0.827	0.750	SC□T43□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L
	16-4D	1	1	6	1.024	0.984	SC□□43□□				

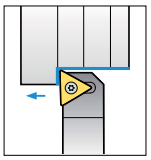
Applicable inserts **B63, B83**

● : Stock item

STACR/L

TC□□





90°

• R type insert

(inch)

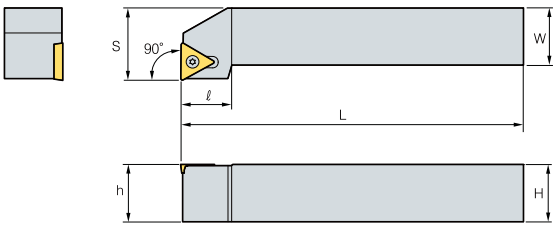
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
STACR/L	06-1.8J	3/8	3/8	2 3/4	0.375	0.375	TC□T1.81.5□	FTKA02206	-	-	TW06P
	08-2K	1/2	1/2	3 1/8	0.500	0.500	TC□T21.5□	FTKA02565	-	-	TW07P

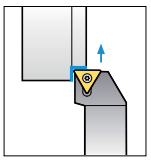
Applicable inserts **B66, B79**

● : Stock item

STFCR/L

TC□□





90°

• R type insert

(inch)

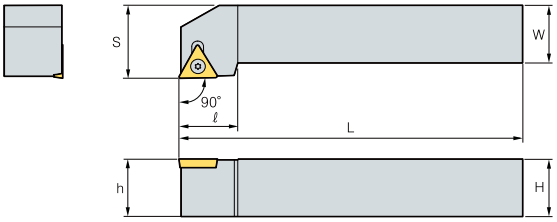
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
STFCR/L	06-1.8J	3/8	3/8	2 3/4	0.500	0.375	0.394	TC□T1.81.5□	FTKA02206	-	-	TW06P
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.551	TC□T21.5□	FTKA02565	-	-	W07P
	10-2A	5/8	5/8	4	0.750	0.625	0.551					
	10-3A	5/8	5/8	4	0.750	0.625	0.748	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.748					
	16-3D	1	1	6	1.250	1	0.992	TC□16T3□				

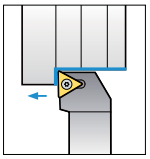
Applicable inserts **B67 ~ B69, B84**

● : Stock item

STGCR/L

TC□□





90°

• R type insert

(inch)

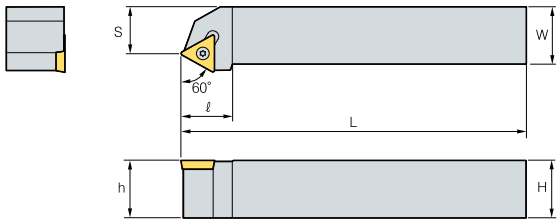
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
STGCR/L	**05-1.8I**	5/16	5/16	2 1/2	0.370	0.313	0.433	TC□T1.81.5□	FTKA02206	-	-	TW06P
	06-1.8J	3/8	3/8	2 3/4	0.500	0.375	0.433					
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.551	TC□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	0.630					
	10-3A	5/8	5/8	4	0.750	0.625	0.827	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.827					
	16-3D	1	1	6	1.250	1.000	0.827					

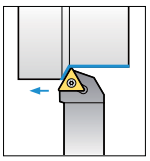
Applicable inserts **B67 ~ B69, B84**

● : Stock item

STTCR/L

TC□□





60°

• R type insert

(inch)

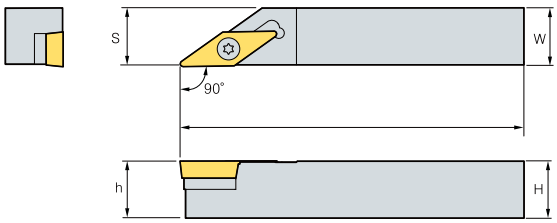
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
STTCR/L	**10-2A**	5/8	5/8	4	0.500	0.625	0.551	TC□T21.5□	FTKA02565	-	-	TW07P
	10-3A	5/8	5/8	4	0.500	0.625	0.748	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.670	0.750	0.748					

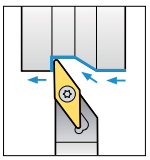
Applicable inserts **B67 ~ B69, B84**

● : Stock item

SVABR/L

VB□□





90°

• R type insert

(inch)

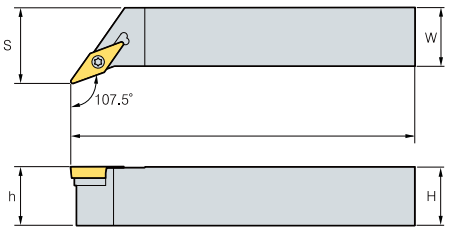
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SVABR/L	**10-3A**	5/8	5/8	4	0.630	0.625	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.755	0.750					

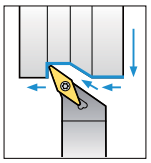
Applicable inserts **B73 ~ B74, B85**

● : Stock item

SVHBR/L

VB□□





107.5°

• R type insert

(inch)

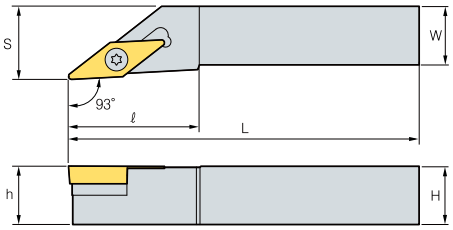
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SVHBR/L	**16-3D**	1	1	6	1.250	1.000	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	20-3D	1 1/4	1 1/4	6	1.250	1.250					

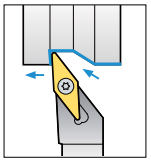
Applicable inserts **B73 ~ B74, B85**

● : Stock item

SVJBR/L

VB□□





93°

• R type insert

(inch)

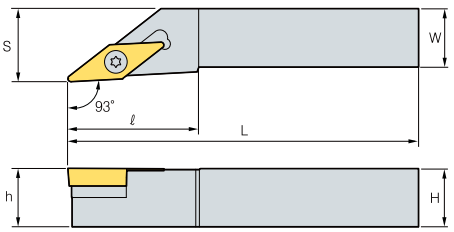
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SVJBR/L	**08-2K**	1/2	1/2	3 1/8	0.625	0.500	1.063	VB□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	1.063					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	1.063					
	10-3A	5/8	5/8	4	0.750	0.625	1.417	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.614					
	16-3D	1	1	6	1.250	1.000	1.614	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	20-3D	1 1/4	1	6	1.250	1.250	2.165					
	85-3D	1 1/4	1 1/4	6	1.575	1.299	2.165					

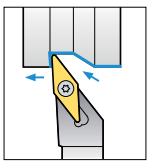
Applicable inserts **B73 ~ B74, B85**

● : Stock item

SVJCR/L

VC□□





93°

• R type insert

(inch)

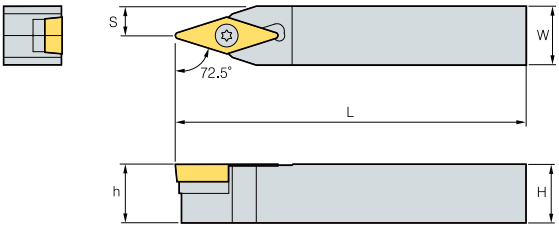
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
SVJCR/L	**08-2K**	1/2	1/2	3 1/8	0.625	0.500	0.984	VC□T22□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	0.984					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	0.984					
	08-2.5K	1/2	1/2	3 1/8	0.625	0.500	1.260	VC□T2.52□	FTKA0307	-	-	TW09P
	10-2.5A	5/8	5/8	4	0.750	0.625	1.260					
	12-2.5B	3/4	3/4	4 1/2	1.000	0.750	1.260					
	10-3A	5/8	5/8	4	0.750	0.625	1.575	VC□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.575					
	16-3D	1	1	6	1.250	1.000	1.575					

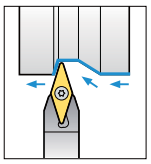
Applicable inserts **B75 ~ B76, B86**

● : Stock item

SVVBN

VB□□





72.5°

(inch)

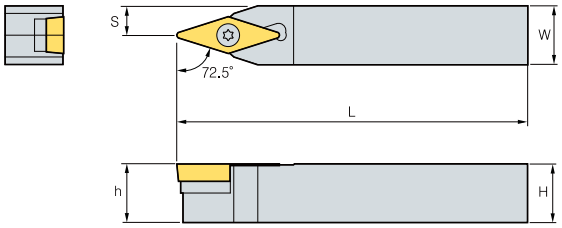
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SVVBN	**08-2K**	1/2	1/2	3 1/8	0.250	0.500	VB□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.313	0.625					
	12-2B	3/4	3/4	4 1/2	0.375	0.750					
	10-3A	5/8	5/8	4	0.313	0.625	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					
	16-3D	1	1	6	0.500	1.000					
	85-3D	1 1/4	1	6	0.500	1.250					

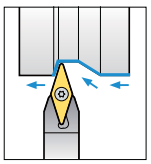
Applicable inserts **B73 ~ B74, B85**

● : Stock item

SVVCN

VC□□





72.5°

(inch)

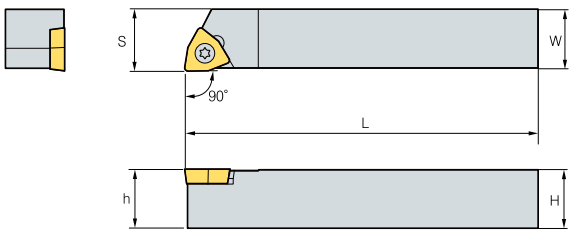
Designation		H	W	L	S	h	Insert	Screw	Shim	ShimScrew	Wrench
SVVCN	**08-2K**	1/2	1/2	3 1/8	0.250	0.500	VC□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.313	0.625					
	12-2B	3/4	3/4	4 1/2	0.375	0.750					
	08-2.5K	1/2	1/2	3 1/8	0.250	0.500	VC□T2.51.5□	FTNA0307	-	-	TW09P
	10-2.5A	5/8	5/8	4	0.313	0.625					
	12-2.5B	3/4	3/4	4 1/2	0.375	0.750					
	10-3A	5/8	5/8	4	0.313	0.625	VC□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					
	16-3D	1	1	6	0.500	1.000					

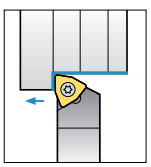
Applicable inserts **B75 ~ B76, B86**

● : Stock item

SWACR/L

WC□□





90°

• R type insert

(inch)

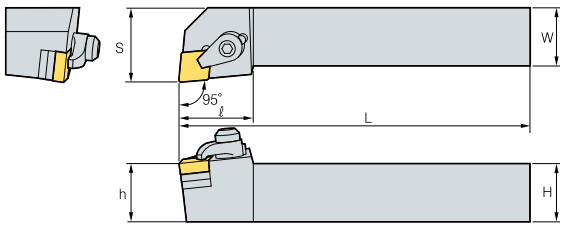
Designation		H	W	L	S	h	Insert	Screw	Wrench
SWACR/L	**06-2J**	3/8	3/8	2 3/4	0.375	0.375	WC□T21.5□	FTKA02565	TW07P
	08-2A	1/2	1/2	4	0.500	0.500			
	10-3A	5/8	5/8	4	0.625	0.625	WC□T32.5□	FTGA03508	TW15P
	12-4B	3/4	3/4	4 1/2	0.750	0.750	WC□T43□	FTGA0411F	TW15P

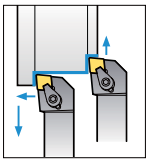
Applicable inserts **B78**

● : Stock item

CCLNR/L

CN□N





95°

• R type insert

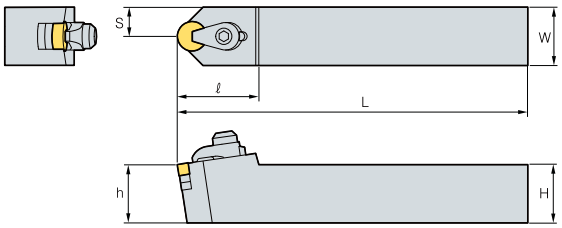
(inch)

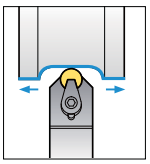
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CCLNR/L **16-4D**	1	1	6	1.250	1.000	1.260	CN□N 43□ 45□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

● : Stock item

CRDNN

RN□N





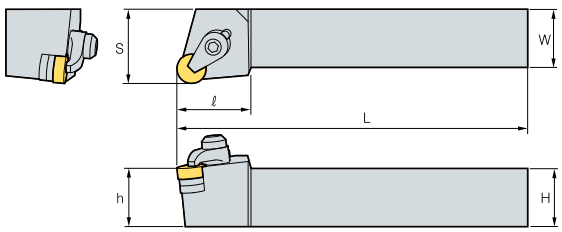
(inch)

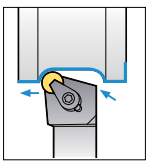
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRDNN **16-4D**	1	1	6	0.500	1.000	1.378	RN□N 43□ 45□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

● : Stock item

CRGNR/L

RN□N





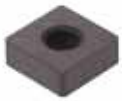
• R type insert

(inch)

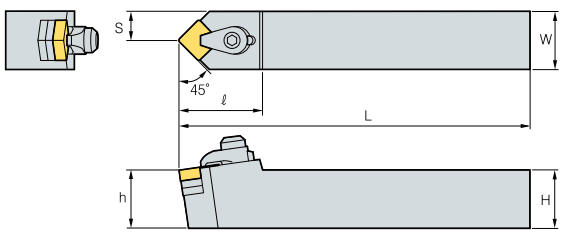
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRGNR/L **16-4D**	1	1	6	1.250	1.000	1.260	RN□N 43□ 45□	CH6R3	MHX0630 SHX0310	SR42CC	SR3	HW40L HW20L

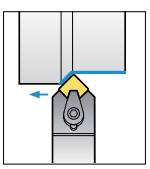
● : Stock item

CSDNN



SN□N





45°

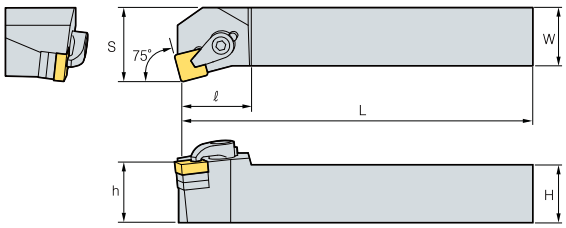
(inch)

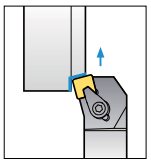
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSDNN **16-4D**	1	1	6	0.500	1.000	1.378	SN□N 43□	CH6R3	MHX0630 SHX0310	SS42CC	SR3	HW40L HW20L

● : Stock item

CSKNR/L

SN□N





75°

• R type insert

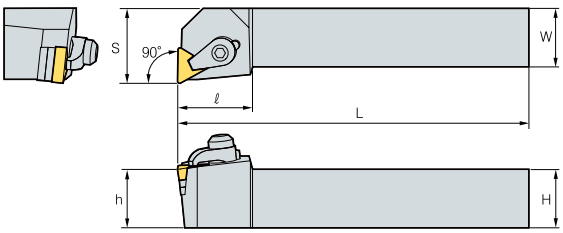
(inch)

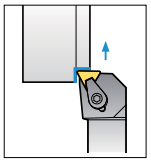
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSKNR/L **16-4D**	1	1	6	1.250	1.000	1.102	SN□N 43□ 45□	CH6R3	MHX0630 SHX0310	SR42CC	SR3	HW40L HW20L

● : Stock item

CTFNR/L

TN□N





90°

• R type insert

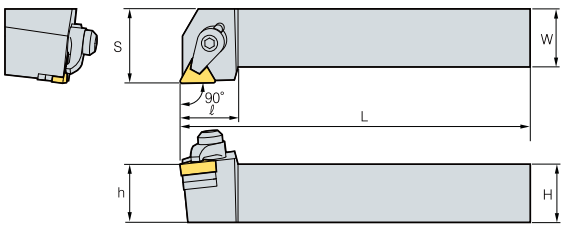
(inch)

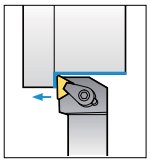
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTFNR/L **16-4D**	1	1	6	1.250	1.000	1.260	TN□N 33□ 35□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

● : Stock item

CTGNR/L

TN□N





90°

• R type insert

(inch)

Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTGNR/L **16-4D**	1	1	6	1.250	1.000	0.984	TN□N 32□ 35□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

● : Stock item

Note) Generally, two shims are clamped to a Ceramic Holder.
However, only one shim is used in clamping 45□□ and 35□□ sized inserts.

S 24 U - M C L N R 4 □

1	2	3	4	5	6	7	8	9	10
Type of Bar	Bar Diameter	Bar Length	Method of Mounting Insert	Insert Shape	Lead Angle of Boring Bar	Relief Angle of Insert	Hand of Bar	Length of Cutting Edge	Manufacturing option

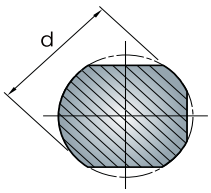
1 Type of Bar

S 24 U - M C L N R 4 □

A : Soild Steel with coolant hole
B : Soild Steel with anti-vibration
C : Carbide bar with fixed steel head
D : Soild Steel bar with anti-vibration device and coolant hole
E : Carbide bar with fixed steel head and coolant hole
G : Carbide bar with fixed steel head and anti-vibration device and coolant hole
H : Solid heavy metal with coolant
J : Solid heavy metal with coolant
S : Soild Steel bar
X : Special bar

2 Bar Diameter

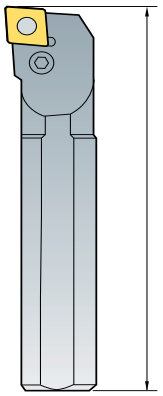
S 24 U - M C L N R 4 □



03 : 0.1875	16 : 1.000
04 : 0.2500	20 : 1.250
05 : 0.3125	24 : 1.500
06 : 0.3700	28 : 1.750
08 : 0.5000	32 : 2.000
10 : 0.6250	36 : 2.250
12 : 0.7500	40 : 2.500

3 Bar Length

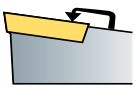
S 24 U - M C L N R 4 □

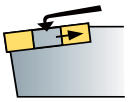


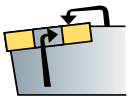
length(L)	(inch)
F	3
G	3.5
H	4
J	4.5
K	5.0
L	5.5
M	6
N	6.5
P	6.75
Q	7.0
R	8.0
S	10.0
T	12.0
U	14.0
V	16.0
W	18.0
Y	20.0
X	Special length

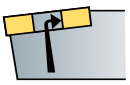
4 Method of Mounting Insert

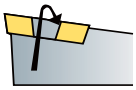
S 24 U - M C L N R 4 □


Top clamping
C


Top and hole clamping
D

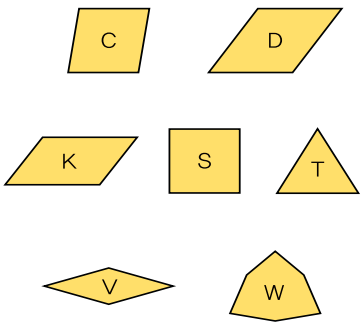

Top and hole clamping
M


Hole clamping
P


Screw on
S

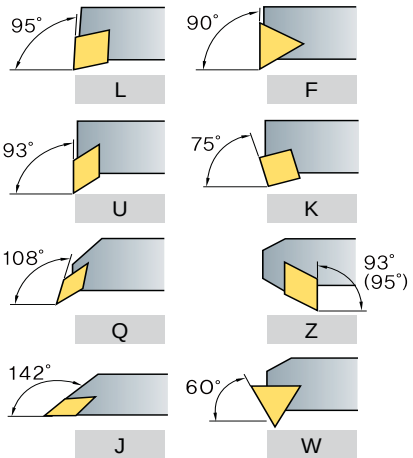
5 Insert Shape

S 24 U - M C L N R 4 □



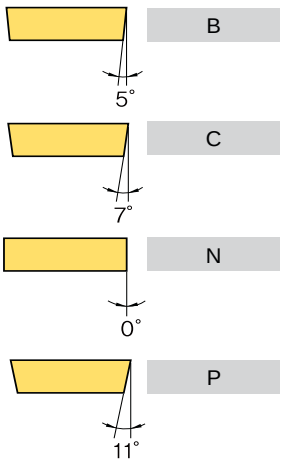
6 Lead Angle of Boring Bar

S 24 U - M C L N R 4 □



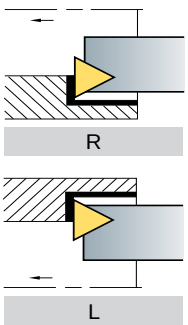
7 Relief Angle of Insert

S 24 U - M C L N R 4 □



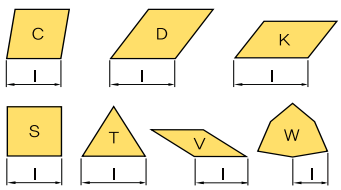
8 Hand of Bar

S 24 U - M C L N R 4 □



9 Length of Cutting Edge

S 24 U - M C L N R 4 □

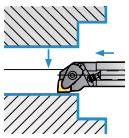
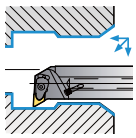
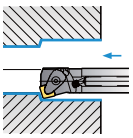
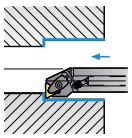
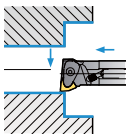


10 Manufacturing option

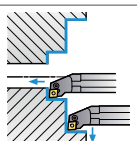
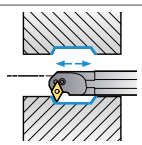
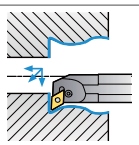
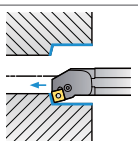
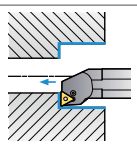
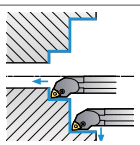
S 24 U - M C L N R 4 □

Manufacturing option

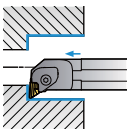
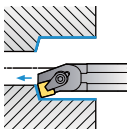
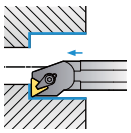
Double Clamp System

Cutting Shape								
Designation	**DCLNR/L**	**DDUNR/L**	**DSKNR/L**	**DTFNR/L**	**DWLNR/L**			
Approach angle	95°	93°	75°	90°	95°			
Page	B136	B136	B136	B137	B137			
Copying		●						
Facing	●				●			
Back turning		●						
Turning	●	●	●	●	●			

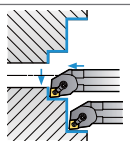
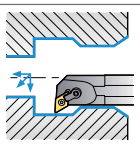
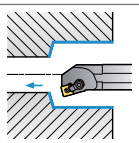
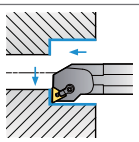
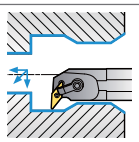
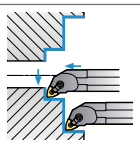
Lever Lock System

Cutting Shape								
Designation	**PCLNR/L**	**PDSNR/L**	**PDUNR/L**	**PSKNR/L**	**PTFNR/L**	**PWLNR/L**		
Approach angle	95°	62.5°	93°	75°	90°	95°		
Page	B138	B138	B139	B139	B140	B140		
Copying		●	●					
Facing	●					●		
Back turning		●	●			●		
Turning	●	●	●	●	●	●		

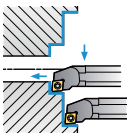
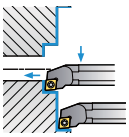
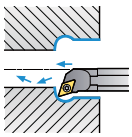
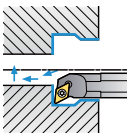
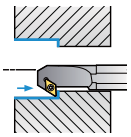
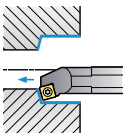
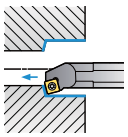
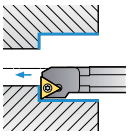
Clamp on System

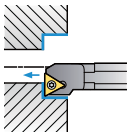
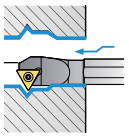
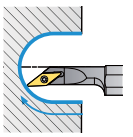
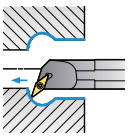
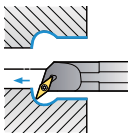
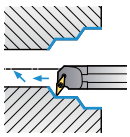
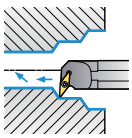
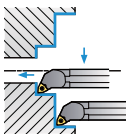
Cutting Shape								
Designation	**CKUNR/L**	**CSKPR/L**	**CTFPR/L**					
Approach angle	93°	75°	90°					
Page	B141	B141	B141					
Copying								
Facing								
Back turning	●							
Turning	●	●	●					

Multi Lock System

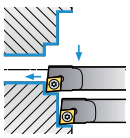
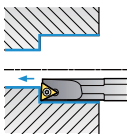
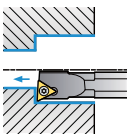
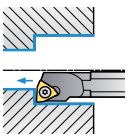
Cutting Shape								
Designation	**MCLNR/L**	**MDUNR/L**	**MSKNR/L**	**MTFNR/L**	**MVUNR/L**	**MWLNR/L**		
Approach angle	95°	93°	75°	90°	93°	95°		
Page	B142	B142	B142	B143	B143	B143		
Copying		●			●			
Facing	●					●		
Back turning		●			●			
Turning	●	●	●	●	●	●		

Screw on System

Cutting Shape								
Designation	SCLCR/L	SCLPR/L	SDQCR/L	SDUCR/L	SDZCR/L	SSKCR/L	SSKPR/L	STFCR/L
Approach angle	95°	95°	107.5°	93°	3°	75°	75°	90°
Page	B142	B142	B145	B145	B146	B146	B146	B147
Copying			●	●				
Facing	●	●						
Back turning			●	●	●			
Turning	●	●	●	●	●	●	●	●

Cutting Shape								
Designation	STFPR/L	STWPR/L	SVJCR/L	SVQBR/L	SVQCR/L	SVUBR/L	SVUCR/L	SWLCR/L
Approach angle	90°	60°	142°	108°	108°	93°	93°	95°
Page	B147	B147	B148	B148	B148	B149	B149	B149
Copying			●	●	●	●	●	●
Facing								
Back turning				●	●	●	●	●
Turning	●	●	●	●	●	●	●	●

Compact Mini

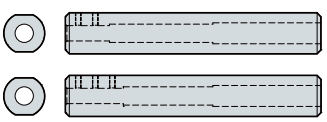
Cutting Shape								
Designation	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L				
Approach angle	95°	93°	93°	93°				
Page	B150	B150	B150	B150				
Copying								
Facing	●	●						
Back turning			●					
Turning	●	●	●	●				

Carbide Shank Boring Bar

Designation	SCLCR/L	SCLPR/L	SDQCR/L	SDUCR/L	STFCR/L
Approach angle	95°	95°	107.5°	93°	91°
Page	B151	B152	B152	B153	B153

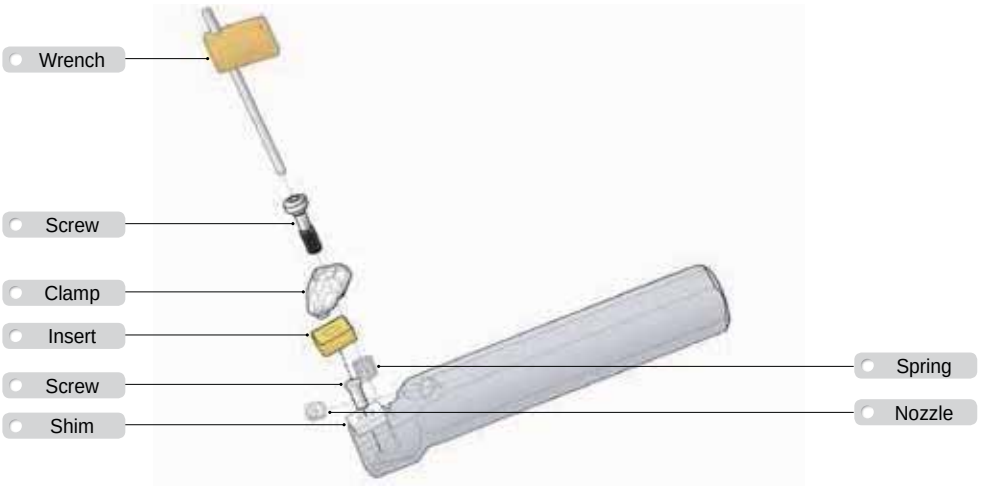
Designation	STFPR/L	STUBR/L	STUPR/L	SWUBR/L	-
Approach angle	91°	93°	93°	93°	-
Page	B154	B154	B155	B155	-

Sleeve

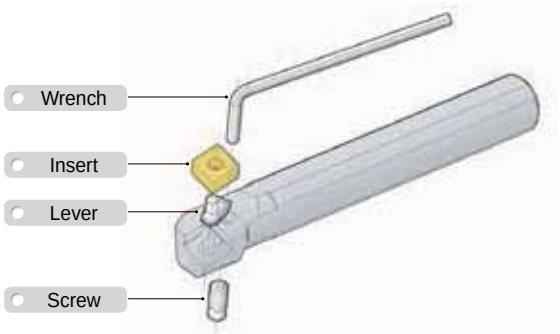
Shape	
Designation	SL
Page	B193

Instructions of Boring Bar assembly

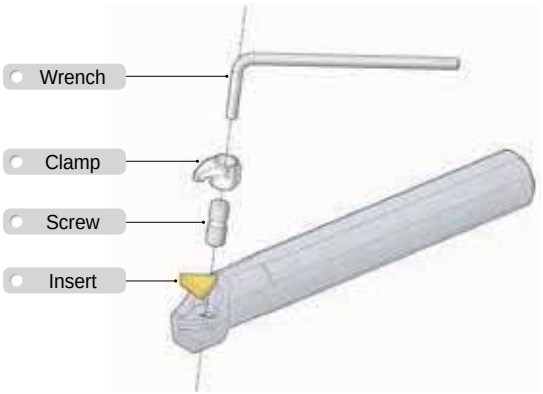
Double Clamp System



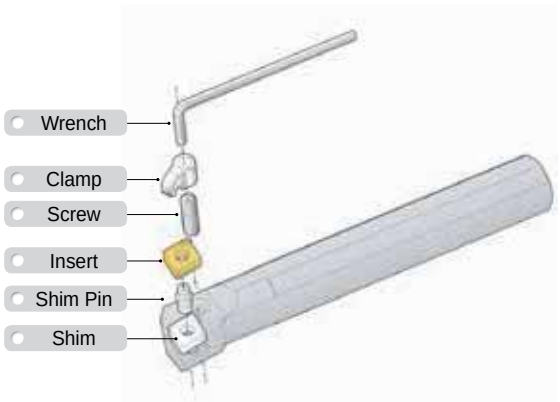
Lever Lock System



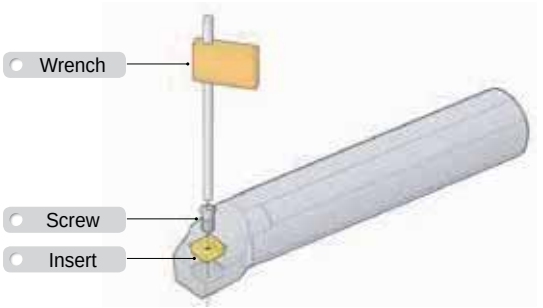
Clamp on System



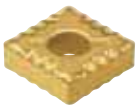
Multi Lock System



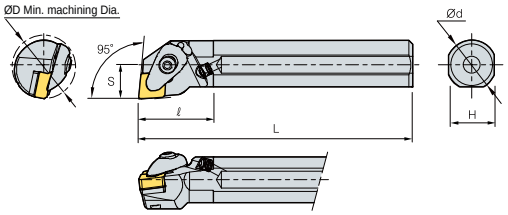
Screw on System

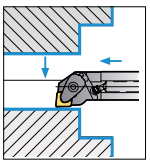


DCLNR/L



CN□□





95°

• R type insert

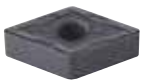
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Nozzle	Wrench
A16R-DCLNR/L-3	1.2	1	0.921	8	0.640	1.063	CN□□33□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	CN0605	HW25P
A16R-DCLNR/L-4	1.2	1	0.921	8	0.640	1.102	CN□□43□	CVH4	CHX0518	SC42V	FTKA0410	SPR0714	CN0605	HW30P
A20S-DCLNR/L-4	1.47	1 1/4	1.171	10	0.765	1.063								
A24T-DCLNR/L-4	1.76	1 1/2	1.382	12	0.890	1.181								
A32U-DCLNR/L-5	2.4	2	1.882	14	1.281	1.575	CN□□53□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	CN0605	HW40L

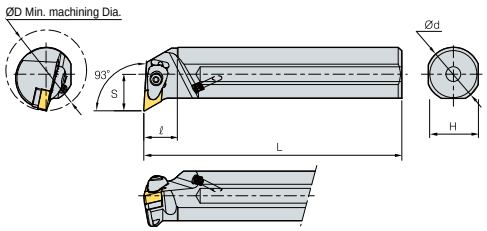
Applicable inserts, see pages **B20~B25**

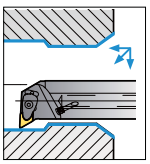
● : Stock item

DDUNR/L



DN□□





93°

• R type insert

(inch)

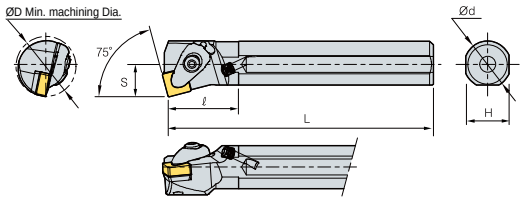
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Nozzle	Wrench
A24T-DDUNR/L-4	2	1 1/2	1.382	12	1.125	0.984	DN□□44□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	HW30P
A32U-DDUNR/L-4	2.4	2	1.882	14	1.281	1.181								
A24T-DDUNR/L-4-3	2	1 1/2	1.382	12	1.125	0.984	DN□□43□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	HW30P
A32U-DDUNR/L-4-3	2.4	2	1.882	14	1.281	1.181								

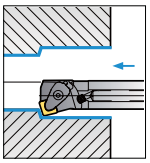
Applicable inserts, see pages **B26~B31**

● : Stock item

DSKNR/L

SN□□





75°

• R type insert

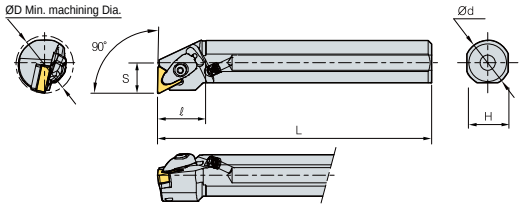
(inch)

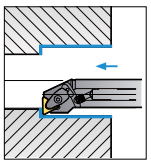
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Nozzle	Wrench
A16R-DSKNR/L-3	1.2	1	0.921	12	0.640	1.063	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	CN0605	HW25P
A16R-DSKNR/L-4	1.2	1	0.921	12	0.640	1.102	SN□□43□	CVH4	CHX0518	SS42V	FTKA0410	SPR0714	CN0605	HW30P
A20S-DSKNR/L-4	1.47	1 1/4	1.171	14	0.765	1.102								
A24T-DSKNR/L-4	1.76	1 1/2	1.382	16	0.890	1.102								

Applicable inserts, see pages **B33~B40**

DTFNR/L

TN□□





90°

• R type insert

(inch)

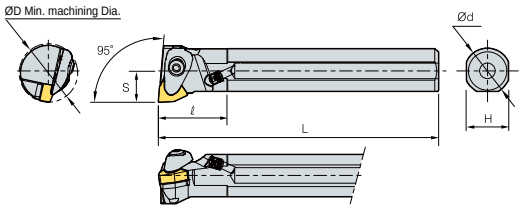
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Nozzle	Wrench
A16R-DTFNR/L-3	1.2	1	0.961	8	0.640	1.063	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	CN0605	HW25P
A20S-DTFNR/L-3	1.47	1 1/4	1.211	10	0.765	1.063								
A24T-DTFNR/L-4	1.76	1 1/2	1.382	16	0.890	1.299	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	CN0605	HW30P
A32U-DTFNR/L-4	2.4	2	1.882	14	1.281	1.299								

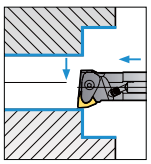
Applicable inserts, see pages **B41~B48**

● : Stock item

DWLNR/L

WN□□





95°

• R type insert

(inch)

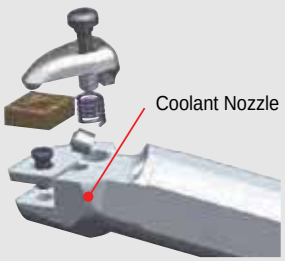
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim Screw	Spring	Nozzle	Wrench
A16R-DWLNR/L-3	1.2	1	0.921	12	0.640	0.748	WN□□33□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	CN0605	HW25P
A20S-DWLNR/L-3	1.47	1 1/4	1.171	14	0.765	0.787								
A24T-DWLNR/L-3	1.76	1 1/2	1.382	16	0.890	0.984								
A16R-DWLNR/L-4	1.2	1	0.921	12	0.640	0.787	WN□□43□	CVH4	CHX0518	SW42V	FTKA0410	SPR0714	CN0605	HW30P
A20S-DWLNR/L-4	1.47	1 1/4	1.171	14	0.765	0.945								
A24T-DWLNR/L-4	1.76	1 1/2	1.382	16	0.890	0.984								
A32U-DWLNR/L-4	2.4	2	1.882	14	1.281	1.260								

Applicable inserts, see pages **B51~B54**

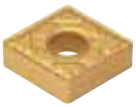
● : Stock item

Features of Double Clamp (Boring bar)

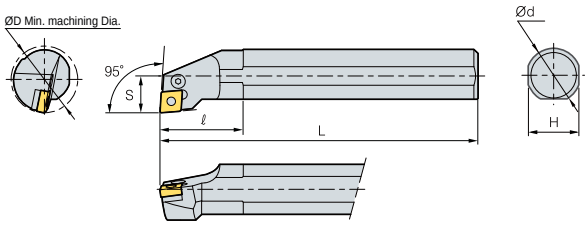
Longer tool life and excellent surface finish can be achieved with the adjustable Coolant Nozzle

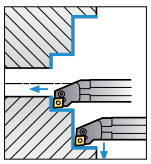


PCLNR/L



CN□□





• R type insert 95°

(inch)

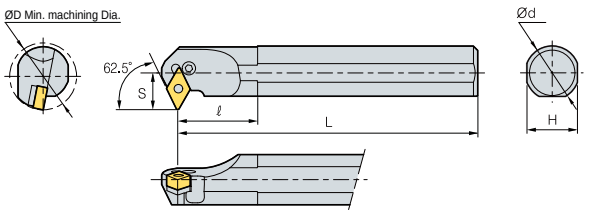
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S10R-PCLNR/L-3	0.770	5/8	0.586	8	0.406	1.102	CN□□33□	LV3C	VHX0509B	-	-	-	HW20L
S12S-PCLNR/L-3	0.930	3/4	0.671	10	0.500	1.260							
S16R-PCLNR/L-3	1.200	1	0.921	8	0.640	1.417							
S16R-PCLNR/L-4	1.200	1	0.921	8	0.640	1.575	CN□□43□	LV4A	VHX0613A	-	-	-	HW25L
S20S-PCLNR/L-4	1.470	1 1/4	0.171	10	0.765	1.969		LV4	VHX1027	SC63	SP6	LSPS6	HW30L
S24T-PCLNR/L-4	1.760	1 1/2	1.382	12	0.890	2.165							
S32U-PCLNR/L-4	2.400	2	1.882	14	1.281	2.205							
S32U-PCLNR/L-6	2.400	2	1.882	14	1.281	2.480	CN□□64□	LV6	VHX1027	SC63	SP6	LSPS6	HW40L
A16R-PCLNR/L-4	1.200	1	0.961	8	0.640	1.575	CN□□43□	LV4A	VHX0613A	-	-	-	HW25L
A20S-PCLNR/L-4	1.470	1 1/4	1.211	10	0.765	1.969		LV4	VHX0821	SC42B	SP4	LSPS4	HW30L
A24T-PCLNR/L-4	1.760	1 1/2	1.882	12	0.890	2.362							
S10R-PCLNR/L-3N	0.770	5/8	0.586	8	0.406	0.984	CN□□33□	LV3CN	VHX0509BN	-	-	-	HW20L
S12S-PCLNR/L-3N	0.930	3/4	0.671	10	0.500	0.984							
S16R-PCLNR/L-3N	1.200	1	0.921	8	0.640	0.984							
S16R-PCLNR/L-4N	1.200	1	0.921	8	0.640	0.984	CN□□43□	LV4AN	VHX0613N	-	-	-	HW25L
S16T-PCLNR/L-4N	1.200	1	0.921	12	0.640	0.984		LV4AN	VHX0613N	-	-	-	HW25L
S20S-PCLNR/L-4N	1.470	1 1/4	1.171	10	0.765	1.181		LV4N	VHX0817N	SC42N	SP4N	LSPS4	HW30L
S20U-PCLNR/L-4N	1.470	1 1/4	1.171	14	0.765	1.181		LV4AN	VHX0820N	SC42N	SP4N	LSPS4	HW30L
S24T-PCLNR/L-4N	1.760	1 1/2	1.382	12	0.890	1.181		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L
S32U-PCLNR/L-4N	2.400	2	1.882	14	1.281	1.181							
S32U-PCLNR/L-6N	2.400	2	1.882	14	1.281	1.181	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L
A10R-PCLNR/L-3N	0.770	5/8	0.586	8	0.406	1.102	CN□□33□	LV3CN	VHX0509BN	-	-	-	HW20L
A12S-PCLNR/L-3N	0.930	3/4	0.671	10	0.500	0.984							
A16R-PCLNR/L-3N	1.200	1	0.921	8	0.640	0.984							
A16R-PCLNR/L-4N	1.200	1	0.921	8	0.640	0.984	CN□□43□	LV4AN	VHX0613N	-	-	-	HW25L
A20S-PCLNR/L-4N	1.470	1 1/4	1.171	10	0.765	1.181		LV4N	VHX0817N	SC42N	SP4N	LSPS4	HW30L
A24T-PCLNR/L-4N	1.760	1 1/2	1.382	12	0.890	1.181		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L
A32U-PCLNR/L-4N	2.400	2	1.882	14	1.281	1.181							
A32U-PCLNR/L-6N	2.400	2	1.882	14	1.281	1.181	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L

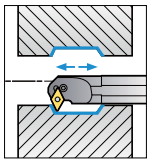
Applicable inserts, see pages **B20~B25**

● : Stock item

PDSNR/L

DN□□





• R type insert 62.5°

(inch)

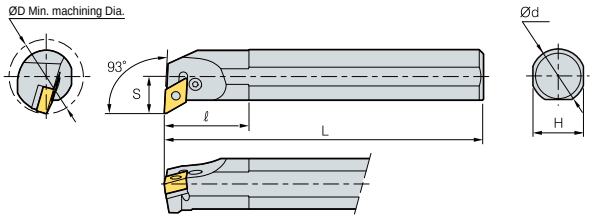
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S20S-PDSNR/L-4	1.705	1 1/4	1.171	10	1.000	1.772	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L
S24T-PDSNR/L-4	2.000	1 1/2	1.382	12	1.125	1.693							
S20S-PDSNR/L-4-3	1.705	1 1/4	1.171	10	1.000	1.772	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L
S24T-PDSNR/L-4-3	2.000	1 1/2	1.382	12	1.125	1.693							
A20S-PDSNR/L-4	1.705	1 1/4	1.211	10	1.000	1.772	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L
A20S-PDSNR/L-4-3	1.705	1 1/4	1.211	10	1.000	1.772	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L
S20S-PDSNR/L-4N	1.705	1 1/4	1.171	10	1.000	0.59	DN□□44□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L
S24T-PDSNR/L-4N	2.000	1 1/2	1.382	12	1.125	0.59							
S20S-PDSNR/L-4-3N	1.705	1 1/4	1.171	10	1.000	0.59	DN□□43□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L
S24T-PDSNR/L-4-3N	2.000	1 1/2	1.382	12	1.125	0.59							
A20S-PDSNR/L-4N	1.705	1 1/4	1.171	10	1.000	0.59	DN□□44□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L
A24T-PDSNR/L-4N	2.000	1 1/2	1.382	12	1.125	0.59							
A20S-PDSNR/L-4-3N	1.705	1 1/4	1.171	10	1.000	0.59	DN□□43□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L
A24T-PDSNR/L-4-3N	2.000	1 1/2	1.382	12	1.125	0.59							

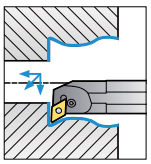
Applicable inserts, see pages **B26~B31**

● : Stock item

PDUNR/L

DN□□





• R type insert 93°
(inch)

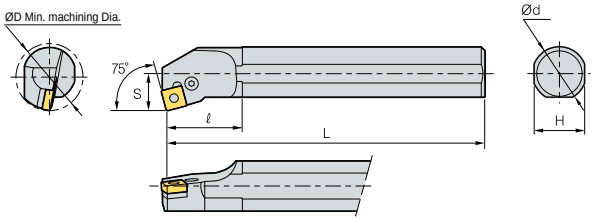
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S12S-PDUNR/L3	0.930	3/4	0.671	10	1.181	1.181	DN□□33□	LV3D	VHX0512B	-	-	-	HW20L
S16R-PDUNR/L3	1.200	1	0.921	8	1.378	1.378							
S20S-PDUNR/L3	1.470	1 1/4	1.171	10	1.575	1.575		LV3	VHX0617	SD317	SP3	LSPS3	HW25L
S20S-PDUNR/L4	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L
S24T-PDUNR/L4	2.000	1 1/2	1.382	12	1.969	1.969							
S32U-PDUNR/L4	2.400	2	1.882	14	2.480	2.480							
S20S-PDUNR/L4-3	1.705	1 1/4	1.171	10	1.969	1.969	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L
S24T-PDUNR/L4-3	2.000	1 1/2	1.382	12	1.969	1.969							
A20S-PDUNR/L4	1.705	1 1/4	1.211	10	1.969	1.969	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L
A20S-PDUNR/L4-3	1.705	1 1/4	1.211	10	1.969	1.969	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L
S12S-PDUNR/L3N	0.930	3/4	0.671	10	1.181	0.984	DN□□33□	LV3DN	VHX0512BN	-	-	-	HW20L
S16R-PDUNR/L3N	1.200	1	0.921	8	1.378	1.378							
S20S-PDUNR/L3N	1.470	1 1/4	1.171	10	1.575	1.575		LV3AN	VHX0617N	SD317N	SP3N-1	LSPS3	HW30L
S20S-PDUNR/L4N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L
S20U-PDUNR/L4N	1.705	1 1/4	1.171	14	1.969	1.969							
S24T-PDUNR/L4N	2.000	1 1/2	1.382	12	1.969	1.969							
S32U-PDUNR/L4N	2.400	2	1.882	14	2.480	1.969							
S20S-PDUNR/L4-3N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L
S24T-PDUNR/L4-3N	2.000	1 1/2	1.382	12	1.969	1.969							
A12S-PDUNR/L3N	0.930	3/4	0.671	10	1.181	0.984	DN□□33□	LV3DN	VHX0512BN	-	-	-	HW20L
A16R-PDUNR/L3N	1.200	1	0.921	8	1.378	1.378							
A20S-PDUNR/L3N	1.470	1 1/4	1.171	10	1.575	1.575		LV3AN	VHX0617N	SD317N	SP3N-1	LSPS3	HW30L
A20S-PDUNR/L4N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L
A24T-PDUNR/L4N	2.000	1 1/2	1.382	12	1.969	1.969							
A32U-PDUNR/L4N	2.400	2	1.882	14	2.480	1.969							
A20S-PDUNR/L4-3N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L
A24T-PDUNR/L4-3N	2.000	1 1/2	1.382	12	1.969	1.969							

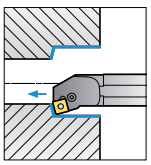
Applicable inserts, see pages **B26~B31**

● : Stock item

PSKNR/L

SN□□





• R type insert 75°
(inch)

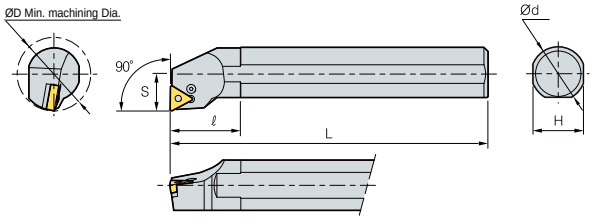
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S16T-PSKNR/L4	1.200	1	0.921	12	0.640	1.654	SN□□43□	LV4A	VHX0613A	-	-	-	HW30L
S20U-PSKNR/L4	1.470	1 1/4	1.171	14	0.765	1.772		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L
S24V-PSKNR/L4	1.760	1 1/2	1.382	16	0.890	1.969							
A16T-PSKNR/L4	1.200	1	0.961	12	0.640	1.654	SN□□43□	LV4A	VHX0613A	-	SP4	-	HW25L
A20U-PSKNR/L4	1.470	1 1/4	1.211	14	0.765	1.969		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L
S16T-PSKNR/L4N	1.200	1	0.921	12	0.640	0.984	SN□□43□	LV4AN	VHX0613N	-	-	-	HW25L
S20U-PSKNR/L4N	1.470	1 1/4	1.171	14	0.765	1.181		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L
S24V-PSKNR/L4N	1.760	1 1/2	1.382	16	0.890	1.181							
A16T-PSKNR/L4N	1.200	1	0.921	12	0.640	0.984	SN□□43□	LV4AN	VHX0613N	-	-	-	HW25L
A20U-PSKNR/L4N	1.470	1 1/4	1.171	14	0.765	1.181		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L
A24V-PSKNR/L4N	1.760	1 1/2	1.382	16	0.890	1.181							

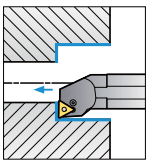
Applicable inserts, see pages **B33~B40**

● : Stock item

PTFNR/L

TN□□





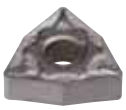
• R type insert 90°
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S10R-PTFNR/L2	0.770	5/8	0.586	12	0.406	1.102	TN□□32□	LV2	VHX0509B	-	-	-	HW25L
S12S-PTFNR/L2	0.930	3/4	0.671	14	0.500	1.299							
S16T-PTFNR/L2	1.200	1	0.921	12	0.640	1.417							
S16T-PTFNR/L3N	1.200	1	0.921	12	0.640	1.654	TN□□33□	LV3B	VHX0512B	-	-	-	HW20L
S20R-PTFNR/L3N	1.470	1 1/4	1.171	14	0.765	1.969		LV3	VHX0617	ST317B	SP3	LSPS3	HW25L
S24S-PTNFR/L3N	1.760	1 1/2	1.382	16	0.890	2.165							
A16T-PTFNR/L3N	1.200	1	0.961	12	0.640	1.575		LV3	VHX0617	ST317B	SP3	LSPS3	HW25L
A20R-PTFNR/L3N	1.470	1 1/4	1.211	14	0.765	1.969		LV3	VHX0617	ST317B	SP3	LSPS3	HW25L
S16T-PTFNR/L3N	1.200	1	0.921	12	0.640	1.654	TN□□33□	LV3BN	VHX0512B	-	-	-	HW20L
S16S-PTFNR/L3N	1.200	1	0.921	16	0.640	1.575		LV3B	VHX0512B	-	-	-	HW20L
S20R-PTFNR/L3N	1.470	1 1/4	1.171	14	0.765	1.969		LV3N	VHX0617N	ST317N	SP3N	LSPS3	HW25L
S24S-PTNFR/L3N	1.760	1 1/2	1.382	16	0.890	2.165							
A16T-PTFNR/L3N	1.200	1	0.961	12	0.640	1.575	TN□□33□	LV3BN	VHX0512B	-	-	-	HW20L
A20R-PTFNR/L3N	1.470	1 1/4	1.211	14	0.765	1.969		LV3N	VHX0617N	ST317N	SP3N	LSPS3	HW25L
A24S-PTNFR/L3N	1.760	1 1/2	1.382	16	0.890	2.165							

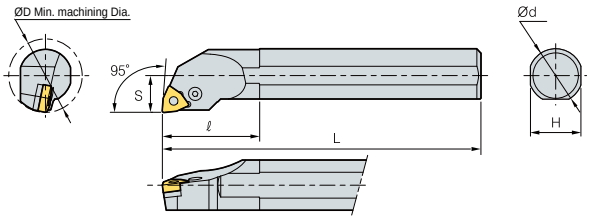
Applicable inserts, see pages **B41~B48**

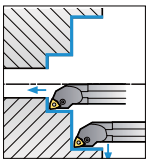
● : Stock item

PWLNR/L



WN□□





• R type insert 95°
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench
S12S-PWLNR/L3	0.930	3/4	0.671	10	0.500	1.574	WN□□33□	LV3B	VHX0512B	-	-	-	HW20L
S16T-PWLNR/L3	1.200	1	0.921	12	0.640	1.575							
S20U-PWLNR/L3	1.470	1 1/4	1.171	14	0.765	1.772		LV3B	VHX0613B	SW317	SP3	LSPS3	HW25L
S16T-PWLNR/L4	1.200	1	0.921	12	0.640	1.772	WN□□43□	LV4A	VHX0613A	-	-	-	HW25L
S20U-PWLNR/L4	1.470	1 1/4	1.171	14	0.765	1.969		LV4	VHX0821	SW42	SP4	LSPS3	HW30L
S12S-PWLNR/L3N	0.930	3/4	0.671	10	0.500	1.574	WN□□33□	LV3BN	VHX0512BN	-	-	-	HW20L
S16T-PWLNR/L3N	1.200	1	0.921	12	0.640	1.575		LV3BN	VHX0512BN	-	-	-	HW20L
S20U-PWLNR/L3N	1.470	1 1/4	1.171	14	0.765	1.772		LV3N	VHX0617N	SW317N	SP3N	LSPS3	HW25L
S16T-PWLNR/L4N	1.200	1	0.921	12	0.640	0.984	WN□□43□	LV4AN	VHX0613N	-	-	-	HW25L
S20U-PWLNR/L4N	1.470	1 1/4	1.171	14	0.765	0.984		LV4N	VHX0820N	SW42N	SP4N	LSPS4	HW30L

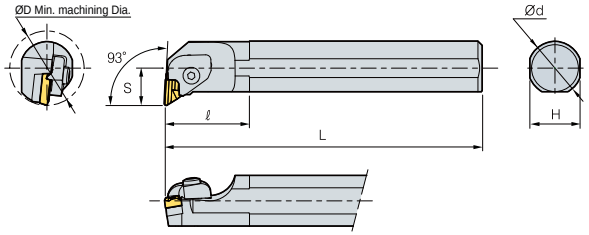
Applicable inserts, see pages **B51~B54**

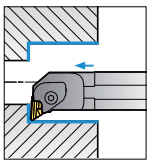
● : Stock item

- **Improved holders and parts ensure performance and durability**
- **"N" stand for New type (Holders and parts)**

CKUNR/L

KN□□





• R type insert 93°

(inch)

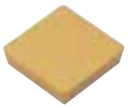
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Spring	Shim	Pin + Spring	Shim Screw	Wrench
S20S-CKUNR3	1.705	1 1/4	1.171	10	1.000	2.756	KN□□33□L	CTH6LI	CHX0625	SR3	SK33CL	PN0515 / SR4	SHX0310	HW40L HW20L
S24T-CKUNR3	2.000	1 1/2	1.382	12	1.125	2.362								
S32U-CKUNR3	2.500	2	1.693	14	1.377	2.165								
S20S-CKUNL3	1.705	1 1/4	1.171	10	1.000	2.756	KN□□33□R	CTH6RI	CHX0625	SR3	SK33C	PN0515 / SR4	SHX0310	HW40L HW20L
S24T-CKUNL3	2.000	1 1/2	1.382	12	1.125	2.362								
S32U-CKUNL3	2.500	2	1.693	14	1.377	2.165								

Applicable inserts, see pages **B32**

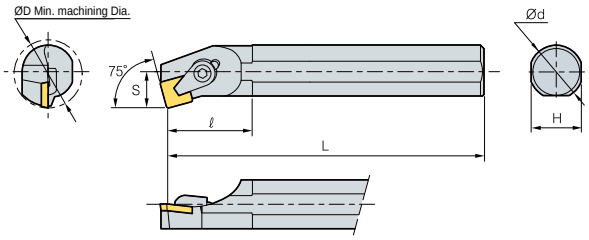
• Use left handed insert for right handed holder

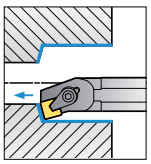
● : Stock item

CSKPR/L



SP□□





• R type insert 75°

(inch)

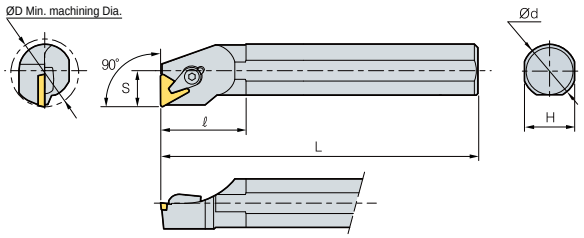
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	C-ring	Wrench
S10R-CSKPR3	0.770	5/8	0.586	8.0	0.406	1.181	SP□□R32□	CH4R1C	CHX0414	CR02C	HW25L
S12S-CSKPR3	0.930	3/4	0.671	10.0	0.500	1.417		CH5R5C	CHX0519C	CR03C	HW30L
S12S-CSKPR4	0.930	3/4	0.671	10.0	0.500	1.102	SP□□R42□	CH6R5	CH0616	CR04C	HW30L
S16R-CSKPR4	1.260	1	0.905	12.0	0.670	1.575					

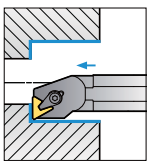
Applicable inserts, see pages **B65~B66**

● : Stock item

CTFPR/L

TP□□





• R type insert 90°

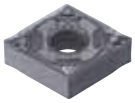
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	C-ring	Shim	Shim pin	Wrench
S08M-CTFPR/L2	0.600	1/2	0.461	6.0	0.312	1.024	TP□□22□	CH4R1C	CHX0414C	CR02C	-	-	HW25L
S10R-CTFPR/L2	0.770	5/8	0.586	8.0	0.406	1.575							
S12S-CTFPR/L2	0.930	3/4	0.671	10.0	0.500	1.575							
S10R-CTFPR/L3	0.770	5/8	0.586	8.0	0.406	1.575	TP□□32□	CH5R5C	CHX0519C	CR03C	-	-	HW30L
S12S-CTFPR/L3	0.930	3/4	0.671	10.0	0.500	1.575							
S16R-CTFPR/L3	1.200	1	0.921	8.0	0.640	1.575		CH6R5	CHX0622C	CR04C	ST32C	SP3C	
S20S-CTFPR/L3	1.470	1 1/4	1.171	10.0	0.765	1.772							
S24T-CTFPR/L3	1.760	1 1/2	1.382	12.0	0.890	2.362							
S24T-CTFPR/L4	1.760	1 1/2	1.382	12.0	0.890	2.362	TP□□43□	CH83R1	CH0823C	CR05C	ST43C	SP4C	HW40L

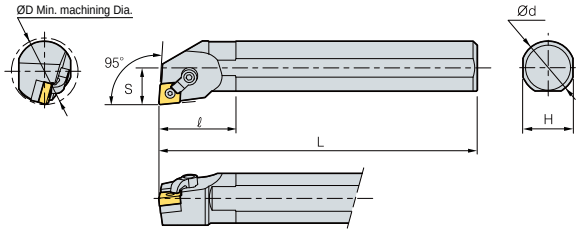
Applicable inserts, see pages **B70~B72**

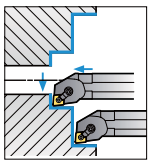
● : Stock item

MCLNR/L



CN□□





• R type insert 95°

(inch)

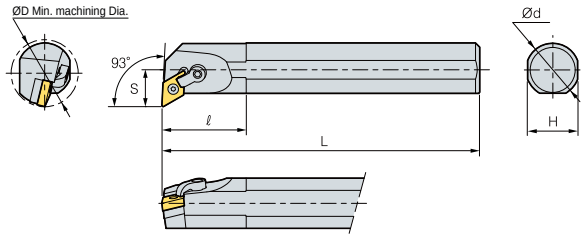
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S12S-MCLNR/L3	0.930	3/4	0.671	10.0	0.500	1.417	CNMG322	CDH7N	DHA10-32-19	-	SP3D3	HW19.8L HW23.8L
S16R-MCLNR/L3	1.200	1	0.921	8.0	0.640	1.417						
S16R-MCLNR/L4	1.200	1	0.921	8.0	0.640	1.417	CNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
S20S-MCLNR/L4	1.705	1 1/4	1.171	10.0	0.765	1.969				SC43D	SP4D	
S24T-MCLNR/L4	2.000	1 1/2	1.382	12.0	0.890	2.362						
A16R-MCLNR/L4	1.200	1	0.921	8.0	0.640	1.575	CNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
A20S-MCLNR/L4	1.705	1 1/4	1.171	10.0	0.765	1.969				SC43D	SP4D	

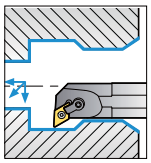
Applicable inserts, see pages **B20~B25**

● : Stock item

MDUNR/L

DN□□





• R type insert 93°

(inch)

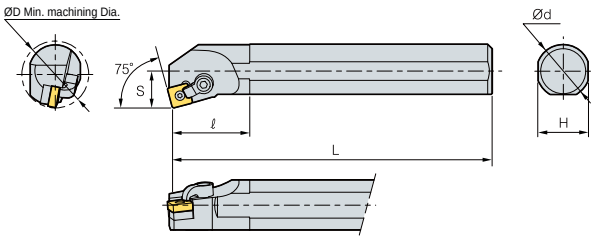
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S20S-MDUNR/L4-3	1.705	1 1/4	1.171	10.0	0.765	1.969	DNMG432	CDH6N	DHA1/4-21	SD43D	SP4D	HW31.8L HW23.8L
S24T-MDUNR/L4-3	2.000	1 1/2	1.382	12.0	0.890	2.362						
A20S-MDUNR/L4-3	1.705	1 1/4	1.171	10.0	0.765	1.969						

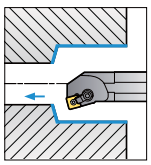
Applicable inserts, see pages **B26~B31**

● : Stock item

MSKNR/L

SN□□





• R type insert 75°

(inch)

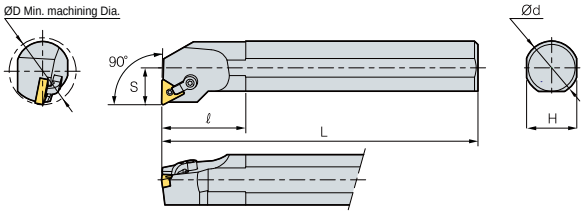
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S16R-MSKNR/L4	1.200	1	0.921	12.0	0.640	1.417	SNMG432	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L
S20S-MSKNR/L4	1.705	1 1/4	1.171	14.0	0.765	1.969				SS43D	SP4D	
S24T-MSKNR/L4	2.000	1 1/2	1.382	16.0	0.890	2.362						
A16R-MSKNR/L4	1.200	1	0.921	8.0	0.640	1.575	SNMG432	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L
A20S-MSKNR/L4	1.705	1 1/4	1.171	10.0	0.765	1.969				SS43D	SP4D	
A24T-MSKNR/L4	2.000	1 1/2	1.382	12.0	0.890	2.362						

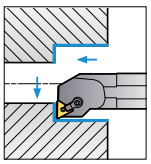
Applicable inserts, see pages **B33~B40**

● : Stock item

MTFNR/L

TN□□





• R type insert 90°

(inch)

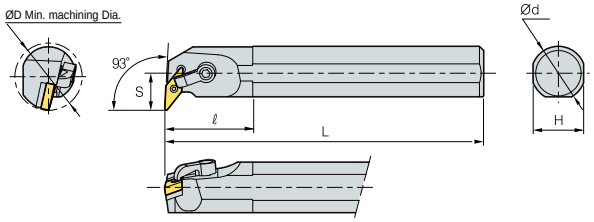
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S16R-MTFNR/L3	1.200	1	0.921	12.0	0.640	1.417	TNMG332	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L
S20S-MTFNR/L3	1.705	1 1/4	1.171	14.0	0.765	1.969		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L
S24T-MTFNR/L3	2.000	1 1/2	1.382	14.0	0.890	2.362						
A16R-MTFNR/L3	1.200	1	0.921	8.0	0.640	1.575	TNMG332	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L
A20S-MTFNR/L3	1.705	1 1/4	1.171	10.0	0.765	1.969		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L

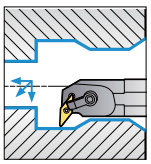
Applicable inserts, see pages **B41~B48**

● : Stock item

MVUNR/L

VN□□





• R type insert 93°

(inch)

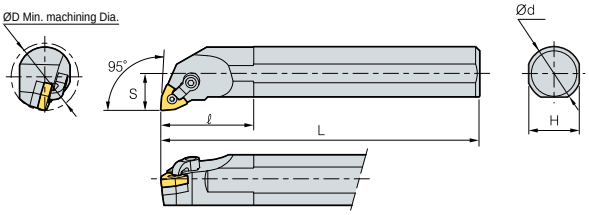
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S20S-MVUNR/L3	1.705	1 1/4	1.171	10.0	0.765	1.969	VNMG332	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L
S24T-MVUNR/L3	2.000	1 1/2	1.382	12.0	0.890	2.362						
A20S-MVUNR/L3	1.705	1 1/4	1.171	10.0	0.765	1.969	VNMG332	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L
A24T-MVUNR/L3	2.000	1 1/2	1.382	12.0	0.890	2.362						

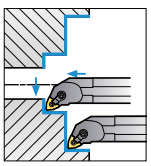
Applicable inserts, see pages **B49~B50**

● : Stock item

MWLNR/L

WN□□





• R type insert 95°

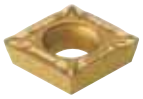
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	ClampScrew	Shim	Shim pin	Wrench
S16R-MWLNR/L3	1.200	1	0.921	8.0	0.640	1.417	WNMG332	CDH7N	DHA10/32-19	-	SP3D3	HW23.8L HW19.8L
S20S-MWLNR/L3	1.705	1 1/4	1.171	10.0	0.765	1.969				SW32D	SP3D	
S24T-MWLNR/L3	2.000	1 1/2	1.382	12.0	0.890	2.362						
S16R-MWLNR/L4	1.200	1	0.921	8.0	0.640	1.417	WNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
S20S-MWLNR/L4	1.705	1 1/4	1.171	10.0	0.765	1.969				SW43D	SP4D	
S24T-MWLNR/L4	2.000	1 1/2	1.382	12.0	0.890	2.362						
A16R-MWLNR/L3	1.200	1	0.921	8.0	0.640	1.575	WNMG332	CDH7N	DHA10/32-19	-	SP3D3	HW31.8L HW19.8L
A20S-MWLNR/L3	1.705	1 1/4	1.171	10.0	0.765	1.969				SW32D	SP3D	
A16R-MWLNR/L4	1.200	1	0.921	8.0	0.640	1.575	WNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
A20S-MWLNR/L4	1.705	1 1/4	1.171	10.0	0.765	1.969				SW43D	SP4D	

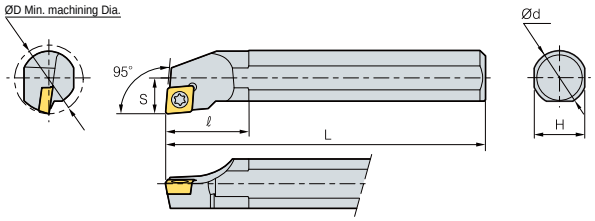
Applicable inserts, see pages **B51~B54**

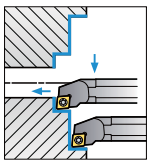
● : Stock item

SCLCR/L



CC□□





• R type insert 95°

(inch)

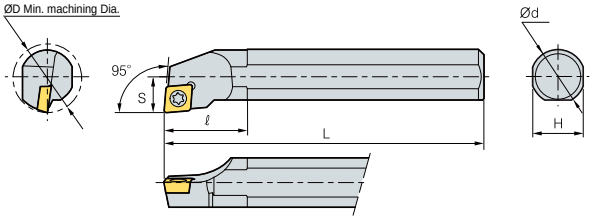
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S05K-SCLCR/L2	0.415	5/16	0.273	5.0	0.219	0.551	CC□T21.5□	FTKA02555			TWO7
S06K-SCLCR/L2	0.480	3/8	0.336	5.0	0.250	0.551	CC□T21.5□	FTKA02565	-	-	TWO7P
S06M-SCLCR/L2	0.480	3/8	0.336	6.0	0.250	0.551	CC□T21.5□				
S08M-SCLCR/L2	0.600	1/2	0.461	6.0	0.312	0.984	CC□T21.5□				
S10R-SCLCR/L2	0.770	5/8	0.586	8.0	0.406	1.260	CC□T21.5□				
S08M-SCLCR/L3	0.600	1/2	0.461	6.0	0.312	0.984	CC□T32.5□	FTGA03508	-	-	TW15P
S10R-SCLCR/L3	0.770	5/8	0.586	8.0	0.406	1.280	CC□T32.5□				
S12S-SCLCR/L3	0.930	3/4	0.671	10.0	0.500	1.496	CC□T32.5□				
S16R-SCLCR/L3	1.200	1	0.921	8.0	0.640	1.772	CC□T32.5□	FTGA03510			TW15P
S16R-SCLCR/L4	1.200	1	0.921	8.0	0.640	1.772	CC□T43□	FTGA0411F	-	-	TW15P
S20S-SCLCR/L4	1.470	1 1/4	1.171	10.0	0.765	1.969	CC□T43□	FTGA0411F	SC42S	SHXN0610F	HW40L TW15P
S24T-SCLCR/L4	1.760	1 1/2	1.382	12.0	0.890	2.362	CC□T43□				
A05F-SCLCR/L2	0.415	5/16	0.293	3.0	0.219	0.551	CC□T21.5□	FTKA02555	-	-	TW07P
A06H-SCLCR/L2	0.480	3/8	0.355	4.0	0.250	0.551	CC□T21.5□	FTKA02565	-	-	TW07P
A08K-SCLCR/L2	0.600	1/2	0.480	5.0	0.312	0.984	CC□T21.5□				
A08K-SCLCR/L3	0.600	1/2	0.480	5.0	0.312	0.984	CC□T32.5□	FTGA03508	-	-	TW15P
A10M-SCLCR/L3	0.770	5/8	0.605	6.0	0.406	1.280	CC□T32.5□				
A12Q-SCLCR/L3	0.930	3/4	0.711	7.0	0.500	1.496	CC□T32.5□				
A16R-SCLCR/L3	1.200	1	0.961	8.0	0.640	1.772	CC□T32.5□	FTGA03510	-	-	TW15P
A16R-SCLCR/L4	1.200	1	0.961	8.0	0.640	1.772	CC□T43□	FTGA0411F	-	-	TW15P
A20S-SCLCR/L4	1.470	1 1/4	1.211	10.0	0.765	1.969	CC□T43□	FTGA0411F	SC42S	SHXN0610F	HW40L,TW15P

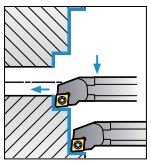
Applicable inserts, see pages **B55~B58, B80**

● : Stock item

SCLPR/L

CP□□





• R type insert 95°

(inch)

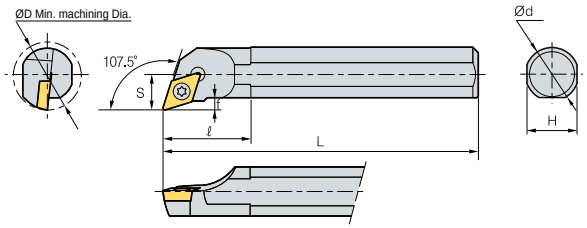
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06M-SCLPR/L2.5	0.480	3/8	0.336	6.0	0.250	-	CP□T2.51.5□	FTNA0305	TW09P
S08M-SCLPR/L2.5	0.600	1/2	0.461	6.0	0.312	0.591	CP□T2.51.5□	FTNA0307	TW09P
S10N-SCLPR/L3	0.770	5/8	0.586	6.5	0.406	0.591	CP□T32□	FTNA0408	TW15P
S10R-SCLPR/L3	0.770	5/8	0.586	8.0	0.406	0.591	CP□T32□		
S12N-SCLPR/L3	0.930	3/4	0.671	6.5	0.500	0.787	CP□T32□		
S12S-SCLPR/L3	0.930	3/4	0.671	10.0	0.500	0.787	CP□T32□		
A06H-SCLPR/L2.5	0.480	3/8	0.355	4.0	0.250	-	CP□T2.51.5□	FTNA0305	TW09P
A08K-SCLPR/L2.5	0.600	1/2	0.480	5.0	0.312	0.787	CP□T2.51.5□	FTNA0307	TW09P
A10M-SCLPR/L3	0.770	5/8	0.605	6.0	0.406	0.591	CP□T32□	FTNA0408	TW15P
A12Q-SCLPR/L3	0.930	3/4	0.711	7.0	0.500	0.787	CP□T32□		

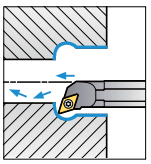
Applicable inserts, see pages **B59**

● : Stock item

SDQCR/L

DC□□





• R type insert 107.5°

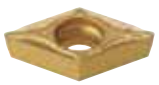
(inch)

Designation	ØD	Ød	H	L	S	ℓ	f	Insert	Screw	Wrench
S06M-SDQCR/L2	0.600	3/8	0.336	6.0	0.375	0.787	0.098	DC□T21.5□	FTKA02555	TW07P
S08M-SDQCR/L2	0.730	1/2	0.461	6.0	0.437	0.866	0.138		FTGA03510	TW07P
S10R-SDQCR/L2	0.850	5/8	0.586	8.0	0.500	1.063	0.157			
S10R-SDQCR/L3	0.850	5/8	0.586	8.0	0.500	1.260	0.157	DC□T32.5□	FTGA03508	TW15P
S12S-SDQCR/L3	0.980	3/4	0.671	10.0	0.562	1.260	0.177			
S16R-SDQCR/L3	1.300	1	0.921	8.0	0.640	1.260	0.276		FTGA03510	TW15P
A06H-SDQCR/L2	0.600	3/8	0.355	6.0	0.375	0.787	0.079	DC□T21.5□	FTKA02555	TW07P
A08K-SDQCR/L2	0.730	1/2	0.480	6.0	0.437	0.866	0.118		FTKA02565	TW07P
A10M-SDQCR/L3	0.850	5/8	0.605	8.0	0.500	1.063	0.118	DC□T32.5□	FTGA03508	TW15P
A12Q-SDQCR/L3	0.980	3/4	0.711	10.0	0.562	1.260	0.118			
A16R-SDQCR/L3	1.300	1	0.961	12.0	0.640	1.260	0.157		FTGA03510	TW15P

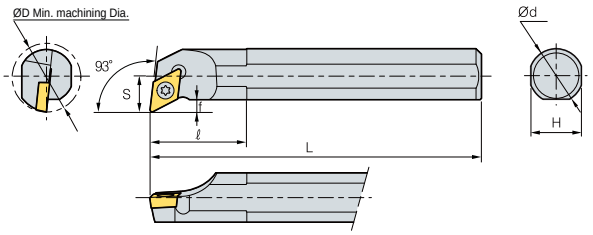
Applicable inserts, see pages **B60~B62, B81**

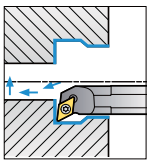
● : Stock item

SDUCR/L



DC□□





• R type insert 93°

(inch)

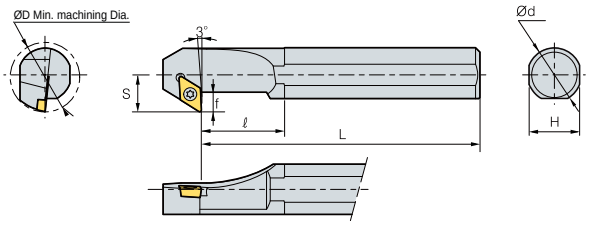
Designation	ØD	Ød	H	L	S	ℓ	f	Insert	Screw	Wrench
S06M-SDUCR/L2	0.600	3/8	0.336	6.0	0.375	-	0.098	DC□T21.5□	FTKA02555	TW07P
S08M-SDUCR/L2	0.730	1/2	0.461	6.0	0.437	0.866	0.138		FTKA02565	TW07P
S10R-SDUCR/L2	0.850	5/8	0.586	8.0	0.500	1.063	0.157			
S10R-SDUCR/L3	0.850	5/8	0.586	8.0	0.500	1.063	0.157	DC□T32.5□	FTGA03508	TW15P
S12S-SDUCR/L3	0.980	3/4	0.671	10.0	0.562	1.575	0.169			
S16R-SDUCR/L3	1.300	1	0.921	8.0	0.640	1.811	0.268		FTGA03510	TW15P
S20S-SDUCR/L3	1.470	1 1/4	1.171	10.0	0.765	1.969	0.331			
A06H-SDUCR/L2	0.600	3/8	0.355	6.0	0.375	-	0.079	DC□T21.5□	FTKA02555	TW07P
A08K-SDUCR/L2	0.730	1/2	0.480	6.0	0.437	0.866	0.118		FTKA02565	TW07P
A10M-SDUCR/L2	0.850	5/8	0.605	8.0	0.500	1.063	0.118			
A12Q-SDUCR/L3	0.980	3/4	0.711	10.0	0.562	1.378	0.118	DC□T32.5□	FTGA03508	TW15P
A16R-SDUCR/L3	1.300	1	0.961	12.0	0.640	1.811	0.177		FTGA03510	TW15P

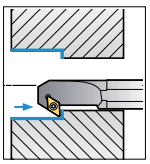
Applicable inserts, see pages **B60~B62, B81**

● : Stock item

SDZCR/L

DC□□





• R type insert 3°

(inch)

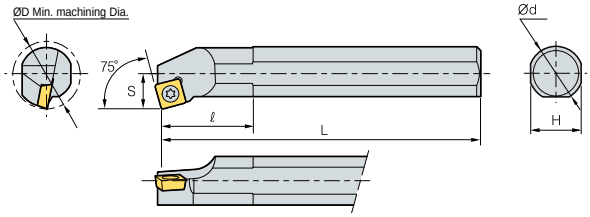
Designation	ØD	Ød	H	L	S	ℓ	f	Insert	Screw	Shim	ShimScrew	Wrench
S10R-SDZCR/L2	0.850	5/8	0.586	8.0	0.500	0.787	0.157	DC□T21.5□	FTKA02565	-	-	TW07P
S12S-SDZCR/L2	0.980	3/4	0.671	10.0	0.562	0.984	0.177					
S16R-SDZCR/L3	1.200	1	0.921	8.0	0.640	1.181	0.272	DC□T32.5□	FTGA03510	-	-	TW15P
S20S-SDZCR/L3	1.470	1 1/4	1.171	10.0	0.765	1.535	0.331		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
S24T-SDZCR/L3	1.760	1 1/2	1.382	12.0	0.890	1.850	0.370					
A16R-SDZCR/L3	1.200	1	0.961	8.0	0.640	1.181	0.177		FTGA03510	-	-	TW15P
A20S-SDZCR/L3	1.470	1 1/4	1.211	10.0	0.765	1.535	0.236		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L

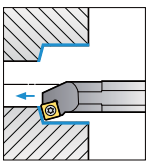
Applicable inserts, see pages **B60~B62, B81**

● : Stock item

SSKCR/L

SC□□





• R type insert 75°

(inch)

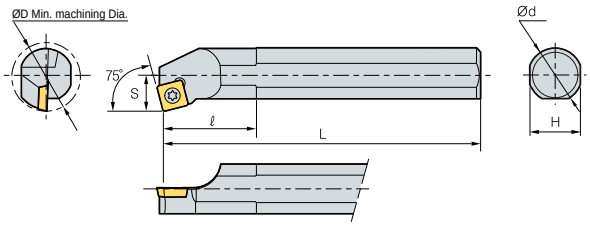
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S08M-SSKCR/L3	0.600	1/2	0.461	6.0	0.312	1.024	SC□T32.5□	FTGA03507	-	-	TW15P
S10R-SSKCR/L3	0.770	5/8	5.860	8.0	0.406	1.260		FTGA03508	-	-	TW15P
S12S-SSKCR/L3	0.930	3/4	0.671	10.0	0.500	1.339					
S16R-SSKCR/L4	1.200	1	0.921	8.0	0.640	1.417	SC□T43□	FTGA0411F	SS42S	SHXN0610F	TW15P
S20S-SSKCR/L4	1.470	1 1/4	1.171	10.0	0.765	1.693			SS42S	SHXN0610F	TW15P, HW40L
A08K-SSKCR/L3	0.600	1/2	0.480	5.0	0.312	1.024	SC□T32.5□	FTGA03507			TW15P
A10M-SSKCR/L3	0.770	5/8	0.605	6.0	0.406	1.260		FTGA03508	-	-	
A12Q-SSKCR/L3	0.930	3/4	0.711	7.0	0.500	1.339		TW15P			
A16R-SSKCR/L4	1.200	1	0.961	8.0	0.640	1.417	SC□T43□	FTGA0411F	SS42S	SFXN0610F	TW15P
A20S-SSKCR/L4	1.470	1 1/4	1.211	10.0	0.765	1.693		FTGA0411F	SS42S	SFXN0610F	TW15P, HW40L

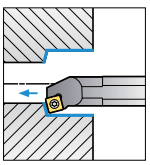
Applicable inserts, see pages **B63, B83**

● : Stock item

SSKPR/L

SP□□





• R type insert 75°

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S08M-SSKPR/L3	0.600	1/2	0.461	6.0	0.312	0.709	SP□T32□R/L	FTNA0307	TW09P
S10N-SSKPR/L3	0.770	5/8	0.586	6.5	0.406	1.181			
S10R-SSKPR/L3	0.770	5/8	0.586	8.0	0.406	1.260			
S12N-SSKPR/L3	0.930	3/4	0.671	6.5	0.500	1.280			
S12S-SSKPR/L3	0.930	3/4	0.671	10.0	0.500	1.378			
A08K-SSKPR/L3	0.600	1/2	0.480	5.0	0.312	0.827	SP□T32□R/L	FTNA0305	TW09P
A10M-SSKPR/L3	0.770	5/8	0.605	6.0	0.408	1.181		FTNA0307	TW09P
A12Q-SSKPR/L3	0.930	3/4	0.711	7.0	0.500	1.260			

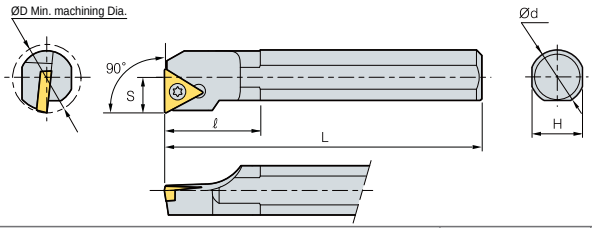
Applicable inserts, see pages **B65~B66**

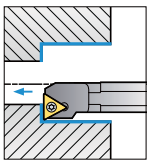
• Use left handed insert for right handed holder

● : Stock item

STFCR/L

TC□□





• R type insert 90° (inch)

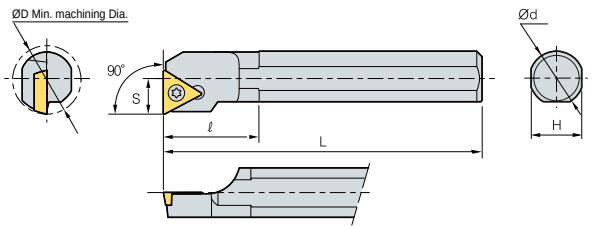
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S06M-STFCR/L1.8	0.480	3/8	0.336	6.0	0.250	0.906	TC□T81.5□	FTKA02206	-	-	TW06P
S08M-STFCR/L1.8	0.600	1/2	0.461	6.0	0.312	1.102					
S08M-STFCR/L2	0.600	1/2	0.461	6.0	0.312	1.181	TC□T21.5□	FTKA02565	-	-	TW07P
S10R-STFCR/L2	0.770	5/8	0.586	8.0	0.406	1.378					
S12S-STFCR/L2	0.930	3/4	0.671	10.0	0.500	1.417					
S12S-STFCR/L3	0.930	3/4	0.671	10.0	0.500	1.575	TC□T32.5□	FTGA03510	-	-	TW15P
S16R-STFCR/L3	1.200	1	0.921	8.0	0.640	1.929					
S20S-STFCR/L3	1.470	1 1/4	1.171	10.0	0.765	1.969	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
S24T-STFCR/L3	1.760	1 1/2	1.382	12.0	0.890	2.362					
A06H-STFCR/L1.8	0.480	3/8	0.355	4.0	0.250	0.906	TC□T1.81.5□	FTKA02206	-	-	TW06P
A08K-STFCR/L1.8	0.600	1/2	0.480	5.0	0.312	1.102					
A08K-STFCR/L2	0.600	1/2	0.480	5.0	0.312	1.181					
A10M-STFCR/L2	0.770	5/8	0.605	6.0	0.406	1.378	TC□T21.5□	FTKA02565	-	-	TW07P
A12Q-STFCR/L2	0.930	3/4	0.711	7.0	0.500	1.417					
A16R-STFCR/L3	1.200	1	0.961	8.0	0.640	1.929	TC□T32.5□	FTKA03510	-	-	TW15P
A20S-STFCR/L3	1.470	1 1/4	1.211	10.0	0.765	1.969		FTGA03512	ST32S	SHXN0509F	TW15P, HW35L

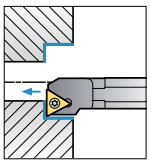
Applicable inserts, see pages **B67~B69, B84**

● : Stock item

STFPR/L

TP□□





• R type insert 90° (inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06M-STFPR/L2	0.480	3/8	0.336	6.0	0.250	-	TP□T22□	FTNA0305	TW09P
S08M-STFPR/L2	0.600	1/2	0.461	6.0	0.312	0.394		FTNA0307	TW09P
S10N-STFPR/L2	0.770	5/8	0.586	6.5	0.406	0.474			
S10R-STFPR/L2	0.770	5/8	0.586	8.0	0.406	0.474			
S12N-STFPR/L3	0.930	3/4	0.671	6.5	0.500	0.551	TP□T33□	FTNA0408	TW15P
S12S-STFPR/L3	0.930	1/4	0.671	10.0	0.500	0.551			
A06H-STFPR/L2	0.480	3/8	0.355	4.0	0.250	-	TP□T22□	FTNA0305	TW09P
A08K-STFPR/L2	0.600	1/2	0.480	5.0	0.312	0.394		FTNA0307	TW09P
A10M-STFPR/L2	0.770	5/8	0.605	6.0	0.406	0.474			
A12Q-STFPR/L3	0.930	3/4	0.711	7.0	0.500	0.551	TP□T33□	FTNA0408	TW15P

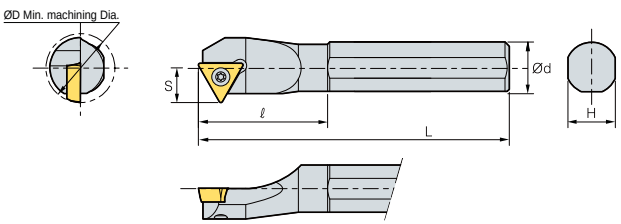
Applicable inserts, see pages **B70~B72**

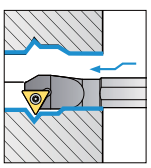
• Use left handed insert for right handed holder

● : Stock item

STWPR/L

TP□□





• R type insert 60° (inch)

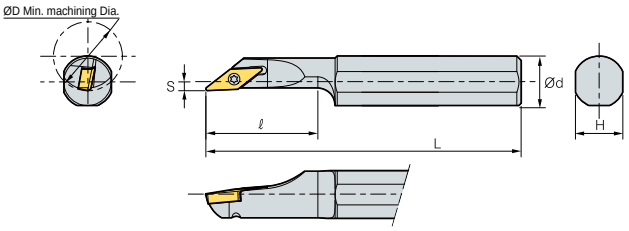
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06M-STWPR/L2	0.480	3/8	0.336	6.0	0.250	0.905	TC□T21.5□	FTNA0305	TW09P
S08M-STWPR/L2	0.600	1/2	0.461	6.0	0.312	1.181	TP□T22□	FTNA0306	TW09P
S10R-STWPR/L2	0.770	5/8	0.586	7.0	0.406	1.378			
S12R-STWPR/L2	0.930	3/4	0.748	8.0	0.492	1.575			

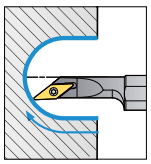
Applicable inserts, see pages **B70~B72**

● : Stock item

SVJCR/L

VC□□





• R type insert 142°

(inch)

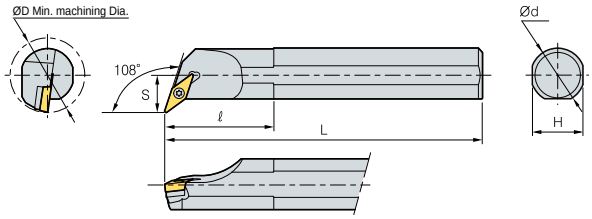
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S8M-SVJCR/L1.5	0.600	1/2	0.461	6.0	0.079	1.024	VCMT1.5(1.5)□□	FTNA0204	TW06P
S10Q-SVJCR/L1.5	0.770	5/8	0.586	7.0	0.079	1.417			

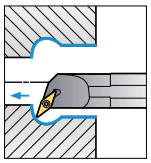
Applicable inserts, see pages **B75~B76**

● : Stock item

SVQBR/L

VB□□





• R type insert 108°

(inch)

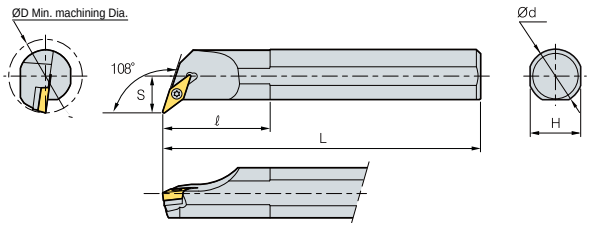
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S20S-SVQBR/L3	1.705	1 1/4	1.171	250	1.000	0.331	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L
S24T-SVQBR/L3	2.000	1 1/2	1.382	300	1.125	0.370					
A20S-SVQBR/L3	1.705	1 1/4	1.211	250	1.000	0.331					

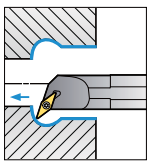
Applicable inserts, see pages **B73~B74, B85**

● : Stock item

SVQCR/L

VC□□





• R type insert 108°

(inch)

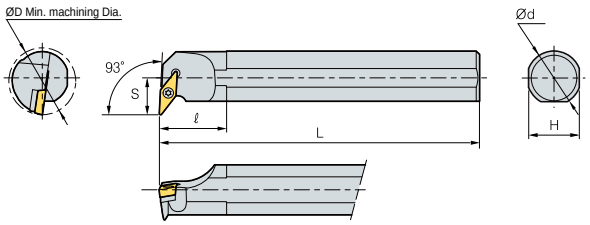
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S10R-SVQCR/L2	0.850	5/8	0.586	8.0	0.500	1.378	VC□T22□	FTKA02565	-	-	TW07P
S12S-SVQCR/L2	0.980	3/4	0.671	10.0	0.562	1.496					
S16R-SVQCR/L2	1.300	1	0.921	8.0	0.640	1.654					
S12S-SVQCR/L2.5	0.980	3/4	0.671	10.0	0.562	1.654	VC□T2.52□	FTKA0307	-	-	TW09P
S16R-SVQCR/L2.5	1.300	1	0.921	8.0	0.640	1.772					
S16R-SVQCR/L3	1.300	1	0.921	8.0	0.640	1.969	VC□T33□	FTGA03510	-	-	TW15P
S20S-SVQCR/L3	1.705	1 1/4	1.171	10.0	1.000	2.205		FTGA03512	SV32S	SHXN0509F	TW15P HW35L
S24T-SVQCR/L3	2.000	1 1/2	1.382	12.0	1.125	2.520					

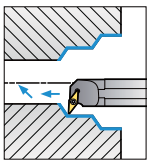
Applicable inserts, see pages **B75~B76, B86**

● : Stock item

SVUBR/L

VB□□





• R type insert 93°

(inch)

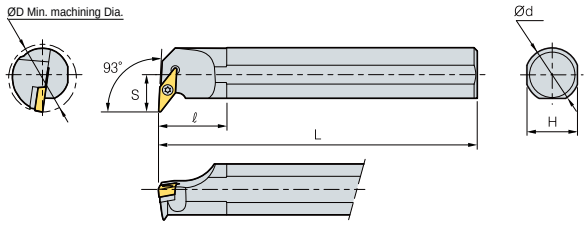
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S20S-SVUBR/L3	1.705	1 1/4	1.171	10.0	1.000	1.929	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L
S24T-SVUBR/L3	2.000	1 1/2	1.382	12.0	1.125	2.205					
A20S-SVUBR/L3	1.705	1 1/4	1.211	10.0	1.000	1.929					

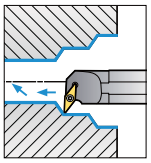
Applicable inserts, see pages **B73~B74, B85**

● : Stock item

SVUCR/L

VC□□





• R type insert 93°

(inch)

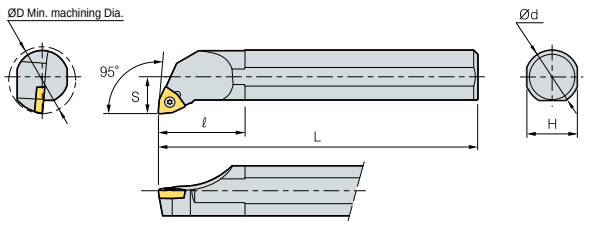
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	ShimScrew	Wrench
S10R-SVUCR/L2	0.850	5/8	0.586	8.0	0.500	1.181	VC□T22□	FTKA02565	-	-	TW07P
S12S-SVUCR/L2	0.980	3/4	0.671	10.0	0.562	1.299					
S16T-SVUCR/L2	1.300	1	0.921	12.0	0.640	1.496					
S12S-SVUCR/L2.5	0.980	3/4	0.671	10.0	0.562	1.378	VC□T2.52□	FTKA0307	-	-	TW09P
S16R-SVUCR/L2.5	1.300	1	0.921	8.0	0.640	1.575					
S16R-SVUCR/L3	1.300	1	0.921	8.0	0.640	1.969	VC□T33□	FTGA03510	-	-	TW15P
S20S-SVUCR/L3	1.705	1 1/4	1.171	10.0	1.000	2.205		FTGA03512	SV32S	SHXN0509F	TW15P HW35L
S24T-SVUCR/L3	2.000	1 1/2	1.382	12.0	1.125	2.520					

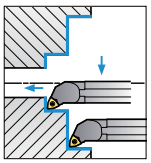
Applicable inserts, see pages **B75~B76, B86**

● : Stock item

SWLCR/L

WC□□





• R type insert 95°

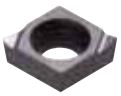
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S16R-SWLCR/L4	1.200	1	0.921	8.0	0.640	1.811	WC□T43□	FTGA0411F	TW15P
S20S-SWLCR/L4	1.470	1 1/4	1.171	10.0	0.765	2.008			
A16R-SWLCR/L4	1.200	1	0.961	8.0	0.640	1.811	WC□T43□	FTGA0411F	TW15P
A20S-SWLCR/L4	1.470	1 1/4	1.211	10.0	0.765	2.008			

Applicable inserts, see pages **B78**

● : Stock item

SCLCR/L



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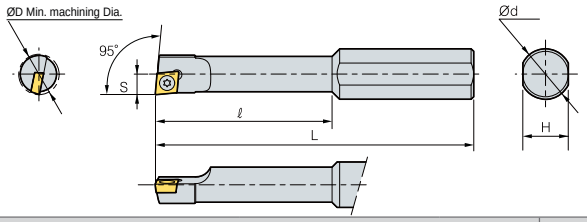
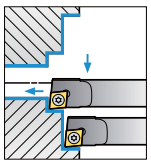




• R type insert 95°

(inch)

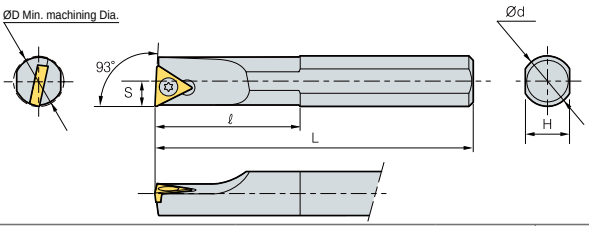
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06H-SCLCR/L1202	0.219	3/8	0.336	3.5	0.098	0.984	CCET1.21□	FTNA01633	TW06P
S06H-SCLCR/L1203	0.250	3/8	0.336	4.0	0.118	0.984			
S06J-SCLCR/L1504	0.293	3/8	0.336	3.5	0.138	1.181	CCET1.51□	FTNA0238	TW06P
S06J-SCLCR/L1505	0.313	3/8	0.336	4.0	0.157	1.181			

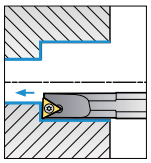
Applicable inserts, see pages **B55**

● : Stock item

STUBR/L

TB□□





• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S05K-STUBR/L1.2	0.415	5/16	0.273	5.0	0.219	1.181	TB□□1.21□R/L	FTNA0204	TW06P
A05F-STUBR/L1.2	0.415	5/16	0.293	3.0	0.219	1.181			

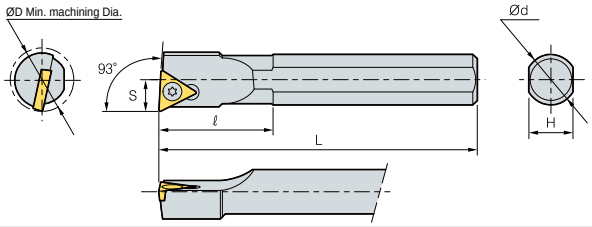
Applicable inserts, see pages **B67**

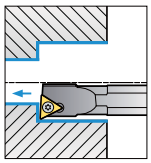
• Use left handed insert for right handed holder

● : Stock item

STUPR/L

TP□□





• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S05K-STUPR/L1.5	0.415	5/16	0.273	5.0	0.219	0.709	TP□□1.51.5□R/L	FTNA02205	TW06P
A05F-STUPR/L1.5	0.415	5/16	0.293	3.0	0.219	0.709			

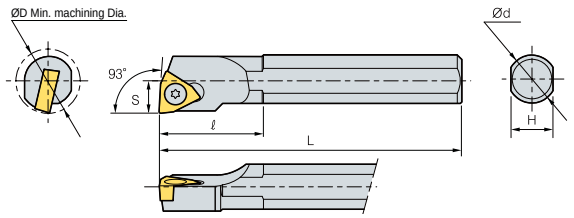
Applicable inserts, see pages **B70~B72**

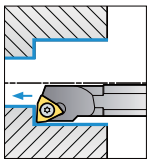
• Use left handed insert for right handed holder

● : Stock item

SWUBR/L

WBGT





• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S03H-SWUBR/L1.2	0.260	3/16	0.177	4.0	0.126	-	WBGT1.21□R/L	FTNA0203	TW06P
S05K-SWUBR/L1.2	0.415	5/16	0.273	5.0	0.219	1.181		FTNA02033	
S05K-SWUBR/L1.5	0.415	5/16	0.273	5.0	0.219	0.709	WBGT1.51.5□R/L	FTNA02205	TW06P
A05F-SWUBR/L1.2	0.415	5/16	0.273	3.0	0.219	1.181	WBGT1.21□R/L	FTNA0203	TW06P
A05F-SWUBR/L1.5	0.415	5/16	0.273	3.0	0.219	0.630	WBGT1.51.5□R/L	FTNA02205	TW06P

Applicable inserts, see pages **B55**

• Use left handed insert for right handed holder

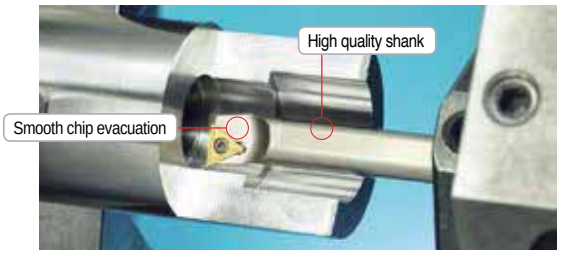
● : Stock item

Carbide Shank Boring Bar

KORLOY Carbide Shank Boring Bar

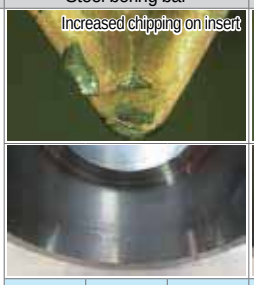
- Excellent cutting performance even in internal machining with chattering
- Available for various workpieces such as steel, stainless steel, cast iron, etc.
- Improved tool life and surface roughness

Features



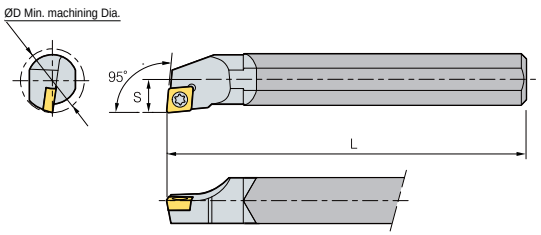
Higher strength and durability than steel shank, special surface treatment applied

Comparison of chipping

Specifications	Steel boring bar			Carbide boring bar		
AISI 4140 vc(sfm) = 656 ap(inch) = 0.016 fn(ipr) = 0.006 Cutting depth : 5D						
	Rmax	Rz	Ra	Rmax	Rz	Ra
	4.67	3.68	0.62	3.07	2.76	0.53

SCLCR/L

CC□□



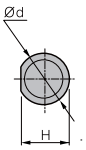


Fig. 1

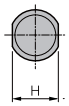
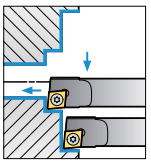


Fig. 2



• R type insert 95°

(inch)

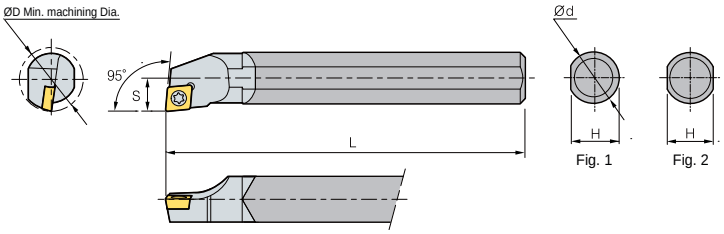
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C025G-SCLCR/L1.2	0.197	5/32	0.150	3.5	0.098	CC□T1.21□	FTNA01633	TW06P	1
C3H-SCLCR/L1.2	0.260	3/16	0.168	4.0	0.126				
C04H-SCLCR/L1.5	0.293	1/4	0.230	4.0	0.156	CC□T1.51□	FTNA0238	TW06P	
C045H-SCLCR/L1.5	0.313	9/32	0.252	5.0	0.158				
C05K-SCLCR/L2	0.415	5/16	0.273	5.0	0.219	CC□T2.15□	FTKA02555	TW07P	2
C06K-SCLCR/L2	0.480	3/8	0.336	5.0	0.250		FTKA02565	TW07P	
C06M-SCLCR/L2	0.480	3/8	0.336	6.0	0.250				
C08M-SCLCR/L-2	0.551	1/2	0.461	6.0	0.312				
C08Q-SCLCR/L2	0.551	1/2	0.461	7.0	0.312				
C08M-SCLCR/L3	0.590	1/2	0.461	6.0	0.312	CC□T32.5□	FTGA03508	TW15P	
C08Q-SCLCR/L3	0.590	1/2	0.461	7.0	0.312				
C10R-SCLCR/L3	0.770	5/8	0.586	8.0	0.406				
C10S-SCLCR/L3	0.770	5/8	0.586	10.0	0.406				
C12R-SCLCR/L3	0.930	3/4	0.671	8.0	0.500				
C12S-SCLCR/L3	0.930	3/4	0.671	10.0	0.500				
C16T-SCLCR/L4	1.200	1	0.921	12.0	0.640	CC□T43□	FTGA0411F	TW15P	
E04H-SCLCR/L1.5	0.321	1/4	0.230	4.0	0.156	CC□T1.51□	FTNA0238	TW06P	1
E045K-SCLCR/L1.5	0.315	9/32	0.252	5.0	0.158				
E05K-SCLCR/L2	0.415	5/16	0.273	5.0	0.219	CC□T2.15□	FTKA02555	TW07P	2
E06K-SCLCR/L2	0.480	3/8	0.336	5.0	0.250		FTKA02565	TW07P	
E06M-SCLCR/L2	0.480	3/8	0.336	6.0	0.250				
E08M-SCLCR/L2	0.551	1/2	0.461	6.0	0.312				
E08Q-SCLCR/L2	0.551	1/2	0.461	7.0	0.312				
E08M-SCLCR/L3	0.590	1/2	0.461	6.0	0.312	CC□T32.5□	FTGA03508	TW15P	
E08Q-SCLCR/L3	0.590	1/2	0.461	7.0	0.312				
E10R-SCLCR/L3	0.770	5/8	0.586	8.0	0.406				
E10S-SCLCR/L3	0.770	5/8	0.586	10.0	0.406				
E12R-SCLCR/L3	0.930	3/4	0.671	8.0	0.500				
E12S-SCLCR/L3	0.930	3/4	0.671	10.0	0.500				
E16T-SCLCR/L4	1.200	1	0.921	12.0	0.640	CC□□T43□	FTGA0411F	TW15P	

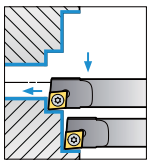
Applicable inserts, see pages **B55~B58**

● : Stock item

SCLPR/L

CP□□





• R type insert 95°

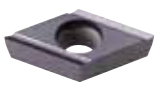
(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C60K-SCLPR/L2.5	0.480	3/8	0.336	5.0	0.250	CP□T2.51.5□	FTNA0305	TW09P	2
C06M-SCLPR/L2.5	0.480	3/8	0.336	6.0	0.250				
C08M-SCLPR/L2.5	0.590	1/2	0.461	6.0	0.312		FTNA0306	TW09P	
C08Q-SCLPR/L2.5	0.590	1/2	0.461	7.0	0.312				
C08M-SCLPR/L3	0.590	1/2	0.461	6.0	0.312	CP□T32□	FTNA0408	TW15P	
C08Q-SCLPR/L3	0.590	1/2	0.461	7.0	0.312				
C10R-SCLPR/L3	0.770	5/8	0.586	8.0	0.406				
C10S-SCLPR/L3	0.770	5/8	0.586	10.0	0.406				
C12R-SCLPR/L3	0.930	3/4	0.471	8.0	0.500				
C12S-SCLPR/L3	0.930	3/4	0.471	10.0	0.500				
E06K-SCLPR/L2.5	0.480	3/8	0.336	5.0	0.250	CP□T2.51.5□	FTNA0305	TW09P	2
E06M-SCLPR/L2.5	0.480	3/8	0.336	6.0	0.250				
E08M-SCLPR/L2.5	0.590	1/2	0.461	6.0	0.312				
E08Q-SCLPR/L2.5	0.590	1/2	0.461	7.0	0.312				
E08M-SCLPR/L3	0.590	1/2	0.461	6.0	0.312		FTNA0407	TW09P	
E08Q-SCLPR/L3	0.590	1/2	0.461	7.0	0.312				
E10R-SCLPR/L3	0.770	5/8	0.586	8.0	0.406	CP□T32□	FTNA0408	TW15P	
E10S-SCLPR/L3	0.770	5/8	0.586	10.0	0.406				
E12R-SCLPR/L3	0.930	3/4	0.471	8.0	0.500				
E12S-SCLPR/L3	0.930	3/4	0.471	10.0	0.500				

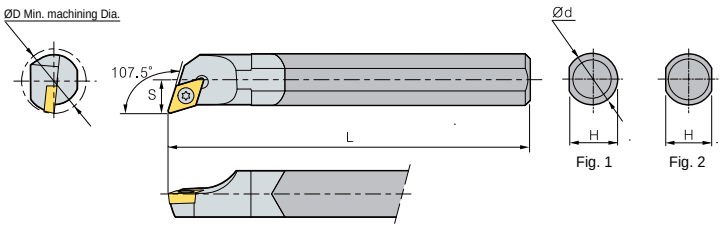
Applicable inserts, see pages **B59**

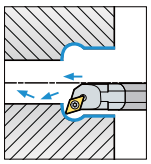
● : Stock item

SDQCR/L



DC□□





• R type insert 107.5°

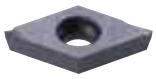
(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-SDQCR/L2	0.393	5/16	0.273	5.0	0.219	DC□T2.15□	FTKA02555	TW07P	2
C06K-SDQCR/L2	0.600	3/8	0.336	5.0	0.375				
C08M-SDQCR/L2	0.730	1/2	0.461	6.0	0.437		FTKA02565	TW07P	
C10R-SDQCR/L2	0.850	5/8	0.586	8.0	0.500				
C10R-SDQCR/L3	0.850	5/8	0.586	8.0	0.500	DC□T32.5□	FTGA03508	TW15P	
C12R-SDQCR/L3	0.980	3/4	0.671	8.0	0.562				
C12S-SDQCR/L3	0.980	3/4	0.671	10.0	0.562				
E05K-SDQCR/L2	0.393	5/16	0.273	5.0	0.219	DC□T2.15□	FTKA02555	TW07P	2
E06K-SDQCR/L2	0.600	3/8	0.336	5.0	0.375				
E08M-SDQCR/L2	0.730	1/2	0.461	6.0	0.437		FTKA02565	TW07P	
E10R-SDQCR/L2	0.850	5/8	0.586	8.0	0.500				
E10R-SDQCR/L3	0.850	5/8	0.586	8.0	0.500	DC□T32.5□	FTGA03508	TW15P	
E12R-SDQCR/L3	0.980	3/4	0.671	8.0	0.562				
E12S-SDQCR/L3	0.980	3/4	0.671	10.0	0.562				

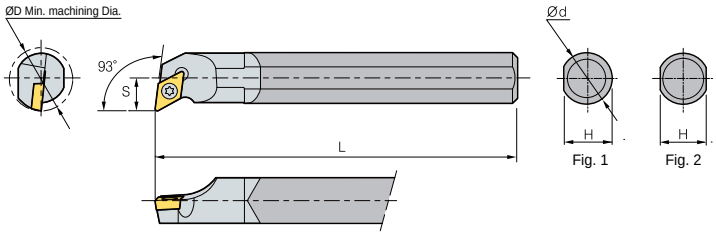
Applicable inserts, see pages **B60~B62, B81**

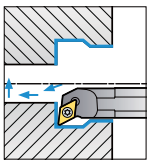
● : Stock item

SDUCR/L



DC□□





• R type insert 93°

(inch)

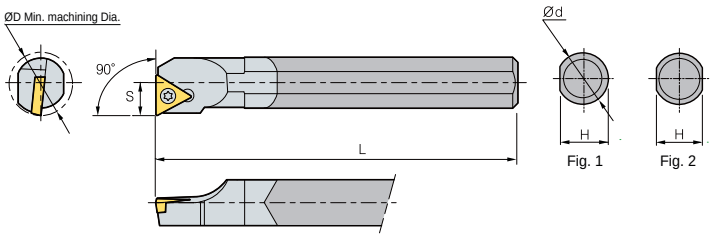
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C06K-SDUCR/L2	0.600	3/8	0.336	5.0	0.375	DC□T21.5□□	FTKA02555	TW07P	2
C06M-SDUCR/L2	0.600	3/8	0.336	6.0	0.375				
C08M-SDUCR/L2	0.730	1/2	0.461	6.0	0.437		FTKA02565	TW07P	
C08Q-SDUCR/L2	0.730	1/2	0.461	7.0	0.437				
C10R-SDUCR/L2	0.850	5/8	0.586	8.0	0.500				
C10S-SDUCR/L2	0.850	5/8	0.586	10.0	0.500				
C10R-SDUCR/L3	0.850	5/8	0.586	8.0	0.500	DC□T32.5□	FTGA03508	TW15P	
C10S-SDUCR/L3	0.850	5/8	0.586	10.0	0.500				
C12R-SDUCR/L3	0.980	3/4	0.671	8.0	0.562				
C12S-SDUCR/L3	0.980	3/4	0.671	10.0	0.562				
C16T-SDUCR/L3	1.300	1	0.921	12.0	0.640		FTGA03510	TW15P	
E06K-SDUCR/L2	0.600	3/8	0.336	5.0	0.375	DC□T21.5□□	FTKA02555	TW07P	2
E06M-SDUCR/L2	0.600	3/8	0.336	6.0	0.375				
E08M-SDUCR/L2	0.730	1/2	0.461	6.0	0.437		FTKA02565	TW07P	
E08Q-SDUCR/L2	0.730	1/2	0.461	7.0	0.437				
E10R-SDUCR/L2	0.850	5/8	0.586	8.0	0.500				
E10S-SDUCR/L2	0.850	5/8	0.586	10.0	0.500				
E10R-SDUCR/L3	0.850	5/8	0.586	8.0	0.500	DC□T32.5□	FTGA03508	TW15P	
E10S-SDUCR/L3	0.850	5/8	0.586	10.0	0.500				
E12R-SDUCR/L3	0.980	3/4	0.671	8.0	0.562				
E12S-SDUCR/L3	0.980	3/4	0.671	10.0	0.562				
E16T-SDUCR/L3	1.300	1	0.921	12.0	0.640		FTGA03510	TW15P	

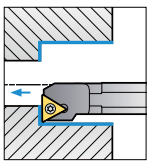
Applicable inserts, see pages **B60~B62, B81**

● : Stock item

STFCR/L

TC□□





• R type insert 90°

(inch)

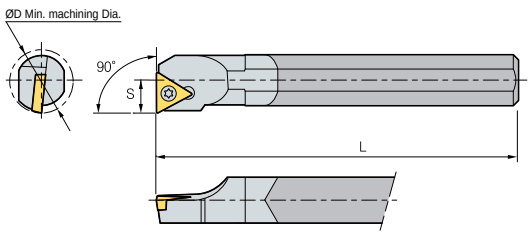
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STFCR/L1.8	0.415	5/16	0.273	5.0	0.219	TC□T1.81.5□□	FTKA02206	TW06P	2
C06K-STFCR/L1.8	0.480	3/8	0.336	5.0	0.250				
C06K-STFCR/L2	0.480	3/8	0.336	5.0	0.250	TC□T21.5□	FTKA02565	TW07P	
C08M-STFCR/L2	0.600	1/2	0.461	6.0	0.312				
C10R-STFCR/L2	0.770	5/8	0.586	8.0	0.406				
C12R-STFCR/L2	0.930	3/4	0.671	8.0	0.500				
C12S-STFCR/L2	0.930	3/4	0.671	10.0	0.500				
C12R-STFCR/L3	0.930	3/4	0.671	8.0	0.500	TC□T32.5□	FTGA03510	TW15P	
C12S-STFCR/L3	0.930	3/4	0.671	10.0	0.500				
E05K-STFCR/L1.8	0.415	5/16	0.273	5.0	0.219	TC□T1.81.5□□	FTKA02206	TW06P	
E06K-STFR/L1.8	0.480	3/8	0.336	5.0	0.250				
E06K-STFCR/L2	0.480	3/8	0.336	5.0	0.250	TC□T21.5□	FTKA02565	TW07P	2
E08M-STFCR/L2	0.600	1/2	0.461	6.0	0.312				
E10R-STFCR/L2	0.770	5/8	0.586	8.0	0.406				
E12R-STFCR/L2	0.930	3/4	0.671	8.0	0.500				
E12S-STFCR/L2	0.930	3/4	0.671	10.0	0.500				
E12R-STFCR/L3	0.930	3/4	0.671	8.0	0.500	TC□T32.5□	FTGA03510	TW15P	
E12S-STFCR/L3	0.930	3/4	0.671	10.0	0.500				

Applicable inserts, see pages **B67~B69**

● : Stock item

STFPR/L

TP□□



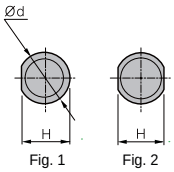
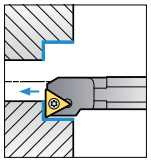


Fig. 1 Fig. 2



• R type insert 90°

(inch)

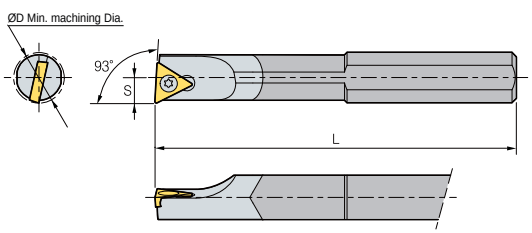
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STFPR/L1.5	0.393	5/16	0.273	5.0	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
C06K-STFPR/L2	0.480	3/8	0.336	5.0	0.250	TP□T22□	FTNA0305	TW09P	
C06M-STFPR/L2	0.480	3/8	0.336	6.0	0.250				
C08M-STFPR/L2	0.590	1/2	0.461	6.0	0.312		FTNA0307	TW09P	
C08Q-STFPR/L2	0.590	1/2	0.461	7.0	0.312				
C10R-STFPR/L2	0.850	5/8	0.586	8.0	0.500				
C10S-STFPR/L2	0.850	5/8	0.586	10.0	0.500				
C12R-STFPR/L2	0.930	3/4	0.671	8.0	0.500				
C12S-STFPR/L2	0.930	3/4	0.671	10.0	0.500				
C12R-STFPR/L3	0.930	3/4	0.671	8.0	0.500	TP□T33□	FTNA0408	TW15P	
C12S-STFPR/L3	0.930	3/4	0.671	10.0	0.500				
C16T-STFPR/L3	1.300	1	0.921	12.0	0.640				
E05K-STFPR/L1.5	0.393	5/16	0.273	5.0	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
E06K-STFPR/L2	0.480	3/8	0.336	5.0	0.250	TP□T22□	FTNA0305	TW09P	
E06M-STFPR/L2	0.480	3/8	0.336	6.0	0.250				
E08M-STFPR/L2	0.590	1/2	0.461	6.0	0.312		FTNA0307	TW09P	
E08Q-STFPR/L2	0.590	1/2	0.461	7.0	0.312				
E10R-STFPR/L2	0.850	5/8	0.586	8.0	0.500				
E10S-STFPR/L2	0.850	5/8	0.586	10.0	0.500				
E12R-STFPR/L2	0.930	3/4	0.671	8.0	0.500				
E12S-STFPR/L2	0.930	3/4	0.671	10.0	0.500				
E12R-STFPR/L3	0.930	3/4	0.671	8.0	0.500	TP□T33□	FTNA0408	TW15P	
E12S-STFPR/L3	0.930	3/4	0.671	10.0	0.500				
E16T-STFPR/L3	1.300	1	0.921	12.0	0.640				

Applicable inserts, see pages **B70~B72**

● : Stock item

STUBR/L

TB□□



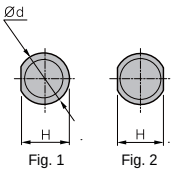
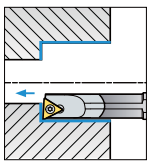


Fig. 1 Fig. 2



• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STUBR/L1.2	0.393	5/16	0.273	5.0	0.219	TB□T1.21□	FTNA0204	TW06P	2
C06K-STUBR/L1.2	0.480	3/8	0.336	5.0	0.250				
E05K-STUBR/L1.2	0.393	5/19	0.273	5.0	0.219	TB□T1.21□	FTNA0204	TW06P	2
E06K-STUBR/L1.2	0.480	3/8	0.336	5.0	0.250				

Applicable inserts, see pages **B67**

● : Stock item

STUPR/L

TP□□

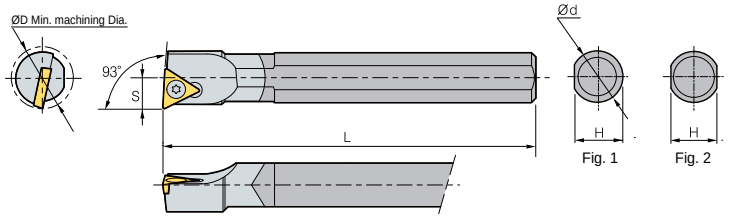
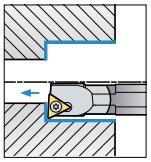


Fig. 1 Fig. 2



• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STUPR/L1.5	0.415	5/16	0.273	5.0	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
C06K-STUPR/L2	0.480	3/8	0.336	5.0	0.250	TP□T22□	FTNA0305	TW09P	
C06M-STUPR/L2	0.480	3/8	0.336	6.0	0.250				
C08M-STUPR/L2	0.600	1/2	0.461	6.0	0.312		FTNA0307	TW09P	
C08Q-STUPR/L2	0.600	1/2	0.461	7.0	0.312				
C10R-STUPR/L2	0.850	5/8	0.586	8.0	0.500				
C10S-STUPR/L2	0.850	5/8	0.586	10.0	0.500				
C12R-STUPR/L2	0.930	3/4	0.671	8.0	0.500				
C12S-STUPR/L2	0.930	3/4	0.671	10.0	0.500				
C12R-STUPR/L3	0.930	3/4	0.671	8.0	0.500	TP□T33□	FTNA0408	TW15P	
C12S-STUPR/L3	0.930	3/4	0.671	10.0	0.500				
C16T-STUPR/L3	1.300	1	0.921	12.0	0.640				
E05K-STUPR/L1.5	0.415	5/16	0.273	5.0	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
E06K-STUPR/L2	0.480	3/8	0.336	5.0	0.250	TP□T22□	FTNA0305	TW09P	
E06M-STUPR/L2	0.480	3/8	0.336	6.0	0.250				
E08M-STUPR/L2	0.600	1/2	0.461	6.0	0.312		FTNA0307	TW09P	
E08Q-STUPR/L2	0.600	1/2	0.461	7.0	0.312				
E10R-STUPR/L2	0.850	5/8	0.586	8.0	0.500				
E10S-STUPR/L2	0.850	5/8	0.586	10.0	0.500				
E12R-STUPR/L2	0.930	3/4	0.671	8.0	0.500				
E12S-STUPR/L2	0.930	3/4	0.671	10.0	0.500				
E12R-STUPR/L3	0.930	3/4	0.671	8.0	0.500	TP□T33□	FTNA0408	TW15P	
E12S-STUPR/L3	0.930	3/4	0.671	10.0	0.500				
E16T-STUPR/L3	1.300	1	0.921	12.0	0.640				

Applicable inserts, see pages **B70~B72**

● : Stock item

SWUBR/L

WB□T

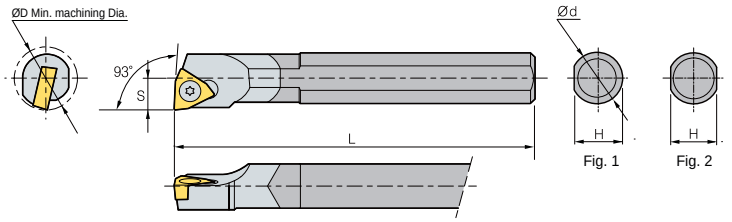
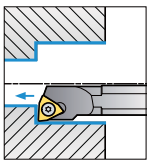


Fig. 1 Fig. 2



• R type insert 93°

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C03H-SWUBR/L1.2	0.260	3/16	0.173	4.0	0.126	WB□T1.21□	FTNA0203	TW06P	1
C04H-SWUBR/L1.2	0.321	1/4	0.213	4.0	0.156				
C05K-SWUBR/L1.2	0.415	5/16	0.273	5.0	0.219		FTNA02033		2
C05K-SWUBR/L1.5	0.415	5/16	0.273	5.0	0.219	WB□T1.51.5□	FTNA02205		
E04H-SWUBR/L1.2	0.321	1/4	0.213	4.0	0.156	WB□T1.21□	FTNA0203	TW06P	1
E05K-SWUBR/L1.2	0.415	5/16	0.273	5.0	0.219		FTNA02033		2
E05K-SWOBR/L1.5	0.415	5/16	0.273	5.0	0.219	WB□T1.51.5□	FTNA02205		

Applicable inserts, see pages **B78**

● : Stock item

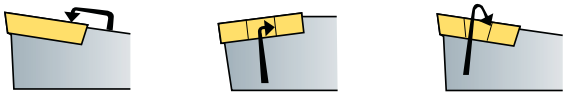
※ See page B193 for applicable sleeves

S T F C R 12 C A-16

1	2	3	4	5	6	7	8	9
Method of Mounting Insert	Insert Shape	Holder Style	Relief Angle of Insert	Hand	Height of Cutting Edge	Cartridge Code	Type of Cartridge	Length of Cutting Edge

1 Method of Mounting Insert

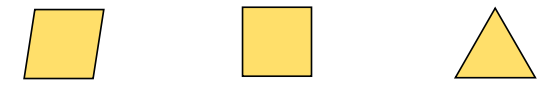
S T F C R 12 C A - 16



Top Clamping	Hole clamping	Screw on
C	P	S

2 Insert Shape

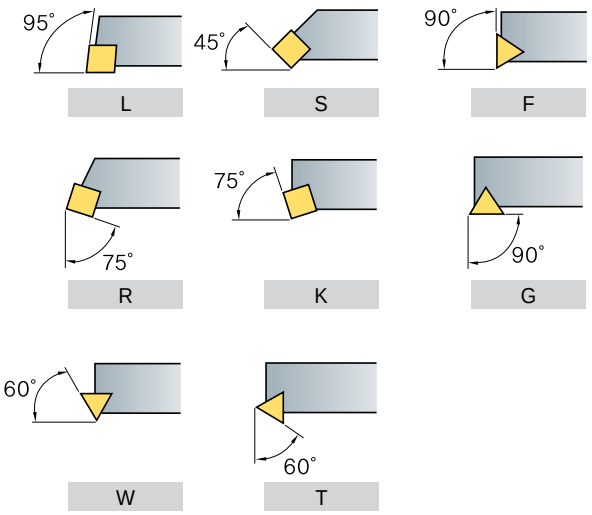
S T F C R 12 C A - 16



C	S	T

3 Holder Style

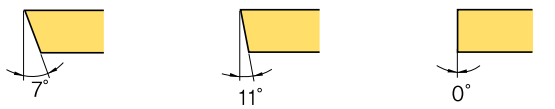
S T F C R 12 C A - 16



L	S	F	R	K	G	W	T

4 Relief Angle of Insert

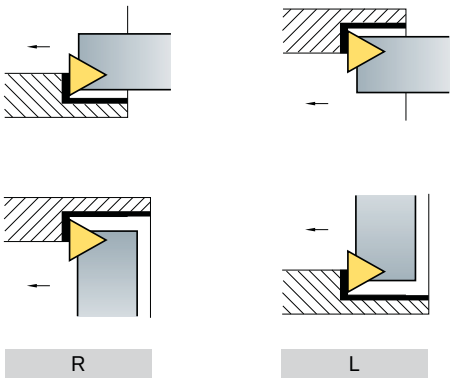
S T F C R 12 C A - 16



C	P	N

5 Hand

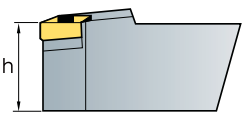
S T F C R 12 C A - 16



R	L

6 Height of Cutting Edge

S T F C R 12 C A - 16



7 Cartrige Code

S T F C R 12 C A - 16

C (Cartridge)

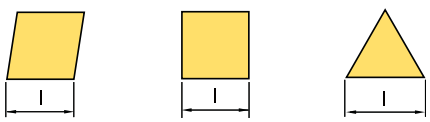
8 Type of Cartridge

S T F C R 12 C A - 16

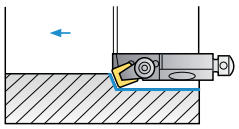
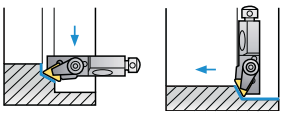
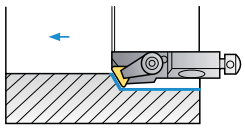
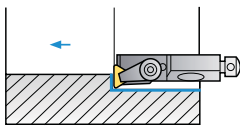
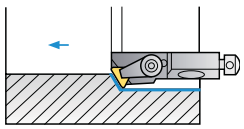
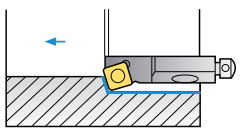
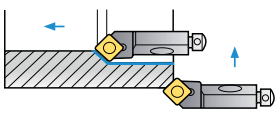
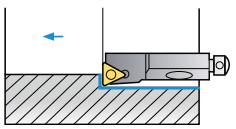
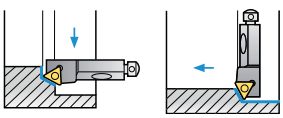
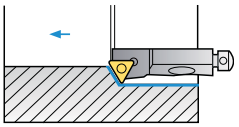
A (ISO5611)

9 Length of Cutting Edge

S T F C R 12 C A - 16

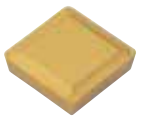


M This is metric size. We can also provide in inch type

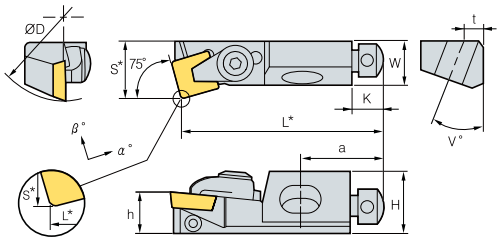
	Cutting Shape			Turning	Copying	Facing	Chamfering	Applicable inserts	Page
Clamp on System	**CSKPR/L**		10CA-09 12CA-12	●				SP□R 0903□□ 1203□□	B171
	CTTPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B172
	CTWPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B172
	CTFPR/L		10CA-11 12CA-16	●		●		TP□R 1103□□ 1603□□	B171
	CTSPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B171
Screw on System	**SSKCR/L**		10CA-09 12CA-12	●				SC□T 09T3□□ 1204□□	B173
	SSSCR/L		10CA-09 12CA-12	●			●	SC□T 09T3□□ 1204□□	B173
	STFCR/L		10CA-11 12CA-16	●		●		TC□T 1102□□ 16T3□□	B173
	STTCR/L		10CA-11 12CA-16	●		●		TC□T 1102□□ 16T3□□	B174
	STWCR/L		10CA-11 12CA-16	●				TC□T 1102□□ 16T3□□	B174

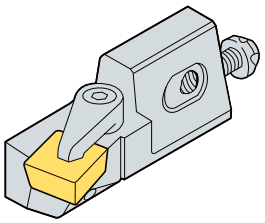
M This is metric size. We can also provide in inch type

CSKPR/L



SP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CSKPR/L	**10CA-09**	40	15	11	50	14	10	8	6	0	20	5	20	SP□R 0903 □□
	12CA-12	50	20	15	55	20	12	8	6	0	20	6	20	1203 □□

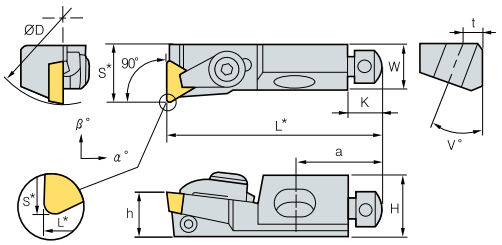
Applicable inserts, see pages **B64 ~ B66** · a base Insert : r = 0.8 D = ØD Min. machining Dia. ● : Stock item

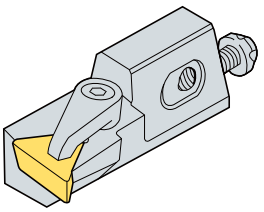
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CSKPR/L	**10CA-09**	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

CTFPR/L

TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTFPR/L	**10CA-11**	40	15	11	50	14	10	8	6	0	20	5	20	TP□R 1103 □□
	12CA-16	50	20	15	55	20	12	8	6	0	20	6	20	1603 □□

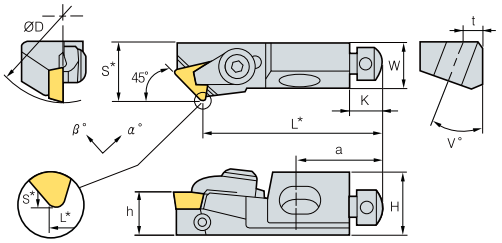
Applicable inserts, see pages **B70 ~ B72** · a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = ØD Min. machining Dia. ● : Stock item

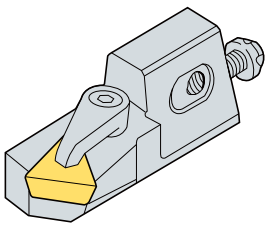
Parts		Clamp	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
CTFPR/L	**10CA-09**	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-12	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

M This is metric size. We can also provide in inch type

CTSPR/L

TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTSPR/L	**10CA-11**	40	15	11	44	14	10	8	4	0	20	5	20	TP□R 1103 □□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603 □□

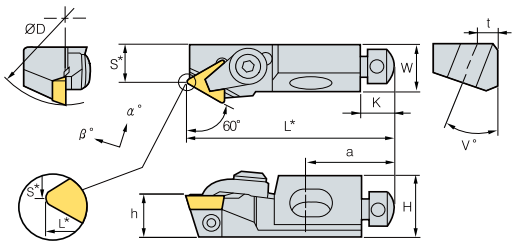
Applicable inserts, see pages **B70 ~ B72** · a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia. ● : Stock item

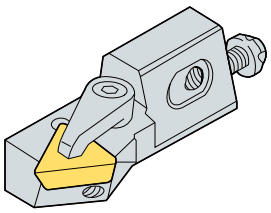
Parts		Clamp	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
CTSPR/L	**10CA-11**	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

M This is metric size. We can also provide in inch type

CTTPR/L

TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTTPR/L	**10CA-11**	40	15	11	50	9	10	8	5	0	20	5	20	TP□R 1103 □□
	12CA-16	50	20	15	55	20	12	8	5	0	20	6	20	1603 □□

Applicable inserts, see pages **B70 ~ B72**

· a base Insert : r = 0.8 D = ØD Min. machining Dia.

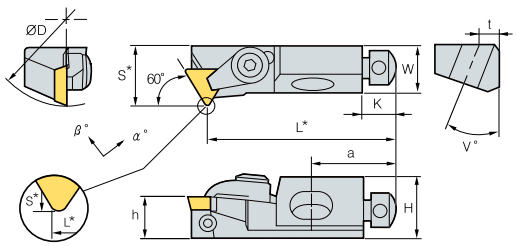
● : Stock item

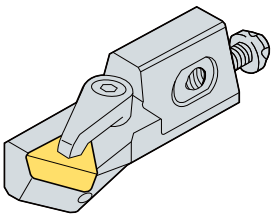
Parts		Clamp	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
CTTPR/L	**10CA-11**	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

M This is metric size. We can also provide in inch type

CTWPR/L

TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTWPR/L	**10CA-11**	40	15	11	44	14	10	8	5	0	20	5	20	TP□R 1103 □□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603 □□

Applicable inserts, see pages **B70 ~ B72**

· a base Insert : r = 0.8 D = ØD Min. machining Dia.

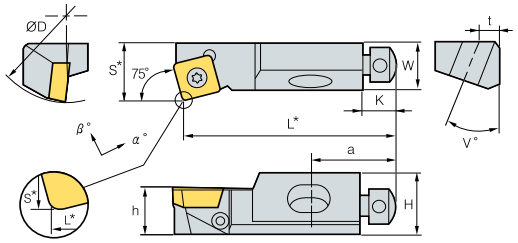
● : Stock item

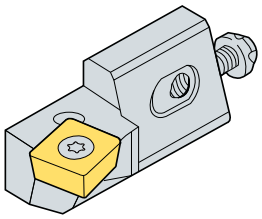
Parts		Clamp	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
CTWPR/L	**10CA-11**	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

M This is metric size. We can also provide in inch type

SSKCR/L

SC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSKCR/L	**10CA-09**	40	15	11	50	14	10	8	0	-4	20	5	20	SC □□ 09T3 □□
	12CA-12	50	20	15	55	20	12	8	0	-4	20	6	20	SC □□ 1204 □□

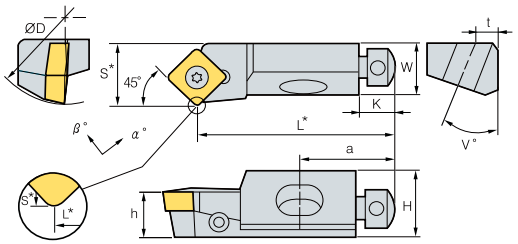
Applicable inserts, see pages **B63, B83** ·a base Insert : r = 0.8 D = ØD Min. machining Dia. ● : Stock item

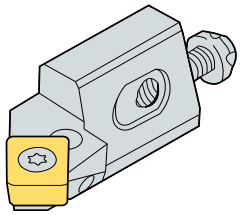
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSKCR/L	**10CA-09**	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

SSSCR/L

SC□□





• R type insert

(mm)

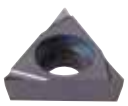
Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSSCR/L	**10CA-09**	40	15	11	44	14	10	8	-5	0	20	5	20	SC □□ 09T3 □□
	12CA-12	50	20	15	47	20	12	8	-5	0	20	6	20	SC □□ 1204 □□

Applicable inserts, see pages **B63, B83** ·a base Insert : r = 0.8 D = ØD Min. machining Dia. ● : Stock item

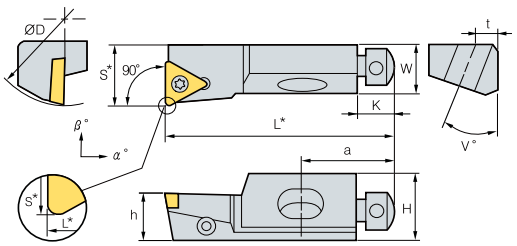
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSSCR/L	**10CA-09**	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

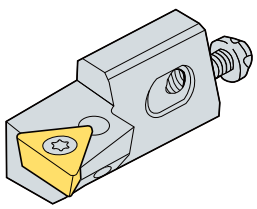
M This is metric size. We can also provide in inch type

STFCR/L



TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STFCR/L	**10CA-11**	40	15	11	50	14	10	8	0	-3	20	5	20	TC □□ 1102 □□
	12CA-16	50	20	15	55	20	12	8	0	-3	20	6	20	TC □□ 16T3 □□

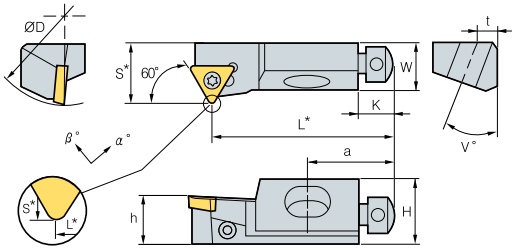
Applicable inserts, see pages **B67 ~ B69, B84** ·a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia. ● : Stock item

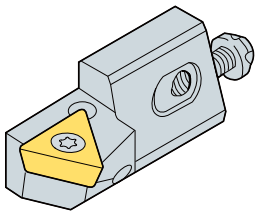
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STFCR/L	**10CA-11**	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

STTCR/L

TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STTCR/L	**10CA-11**	40	15	11	50	9	10	8	-5	0	20	5	20	TC □□ 1102 □□
	12CA-16	50	20	15	47	20	12	8	-3	0	20	6	20	TC □□ 16T3 □□

Applicable inserts, see pages **B67 ~ B69, B84**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

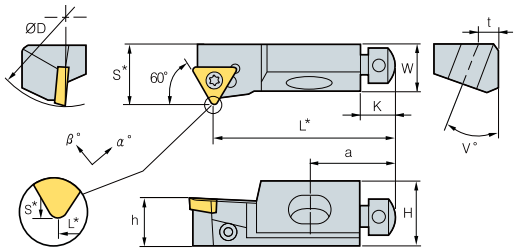
● : Stock item

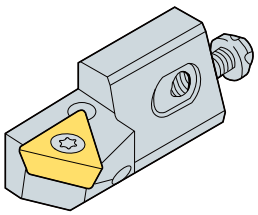
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STTCR/L	**10CA-11**	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 07P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

STWCR/L

TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STWCR/L	**10CA-11**	40	15	11	44	14	10	8	0	-4	20	5	20	TC □□ 1102 □□
	12CA-16	50	20	15	47	20	12	8	-5	0	20	6	20	TC □□ 16T3 □□

Applicable inserts, see pages **B67 ~ B69, B84**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

● : Stock item

Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STWCR/L	**10CA-11**	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

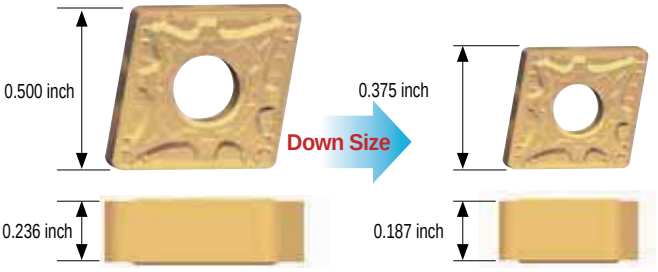
Economical small insert with powerful cutting performance

SAVE TURN

- Strongly recommended turning insert for machining smaller diameter than Ø3.937(inch)
- Small but powerful and economical insert which performs the same like standard-sized inserts under the depth of cut of 0.118(inch)

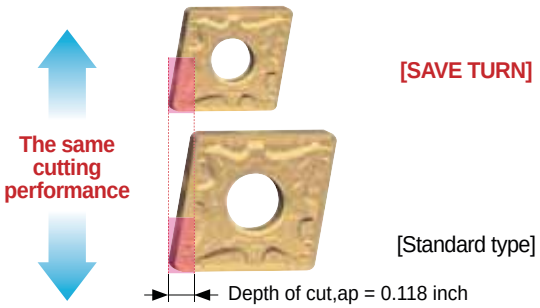
Features

Comparison of insert sizes



▸ Optimized size of the same performance like the standard type

Comparison of cutting performance

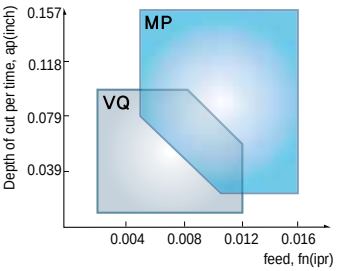


▸ Performs the same like standard type inserts under the depth of cut of 0.118(inch)

Features of chip breaker

Insert shape	Cutting edge	Features
VQ 		- For finishing steel - Efficient chip breaking and low cutting resistance - Various application available at low depth of cut - Recommended depth of cut : 0.02~0.098inch
MP 		- For medium cutting of steel - 4 dots for improved chip control in medium cutting to finishing - Stable chip evacuation at high depth of cut - Stable tool life due to lower cutting loads at high feed - Recommended depth of cut : 0.02~0.157inch

Application area of chip breaker



VQ : ap=(inch) 0.020~0.098
fn(ipr)=0.002~0.012

MP : ap(inch)=0.020~0.157
fn(ipr)=0.006~0.016

Application example (NC3220)

Alloy steel (SCM4140)

■ **Cutting conditions** vc(sfm) = 820, fn(ipr) = 0.010
ap(inch) = 0.079, continuous cutting, wet

■ **Cutting Result**

CNMG332-HM
SAVE TURN

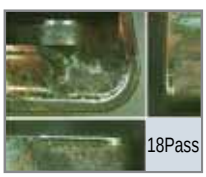
CNMG432-HM
Standard type

Alloy steel (SCM4140)

■ **Cutting conditions** vc(sfm) = 820, fn(ipr) = 0.010
ap(inch) = 0.079, interrupted cutting, wet

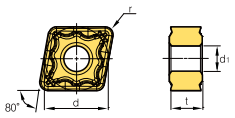
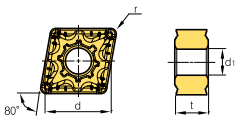
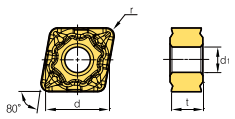
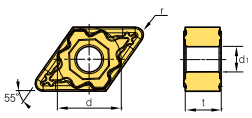
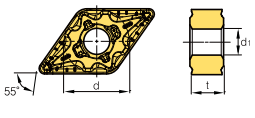
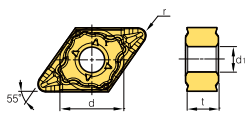
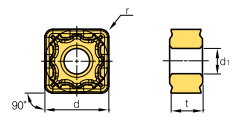
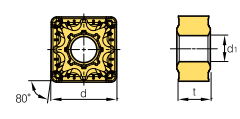
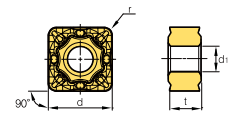
■ **Cutting Result**

CNMG332-HM
SAVE TURN



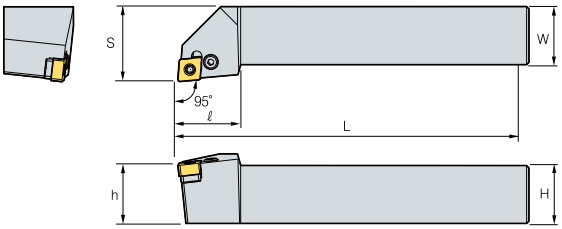
CNMG432-HM
Standard type

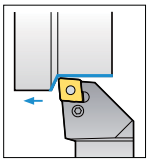
Insert

Type	Picture	Designation		Coated NC3010	Coated NC3220	Coated NC5330	Dimensions (inch) d	t	r	d1	cutting conditions ap (inch)	fn (ipr)	Configuration	Available tool holders page
C Type	CNMG-HM	CNMG	332-HM	●		●	0.375	3/16	1/32	1/8	0.024~0.138	0.005~0.016		B18 B21
			333-HM	●		●	0.375	3/16	3/64	1/8	0.028~0.138	0.006~0.018		
	CNMG-MP	CNMG	331-MP				0.375	3/16	1/64	1/8	0.016~0.15	0.004~0.016		B18 B21
			332-MP				0.375	3/16	1/32	1/8	0.020~0.157	0.006~0.016		
			333-MP				0.375	3/16	3/64	1/8	0.031~0.165	0.006~0.020		
	CNMG-VQ	CNMG	332-VQ	●		●	0.375	3/16	1/32	1/8	0.012~0.079	0.004~0.014		B18 B21
			333-VQ	●		●	0.375	3/16	3/64	1/8	0.014~0.079	0.006~0.016		
D Type	DNMG-HM	DNMG	33.52-HM	●		●	0.375	7/32	1/32	1/8	0.024~0.138	0.005~0.016		B18 B19 B21
			33.53-HM	●		●	0.375	7/32	3/64	1/8	0.028~0.138	0.006~0.018		
	DNMG-MP	DNMG	33.51-MP				0.375	7/32	1/64	1/8	0.016~0.15	0.004~0.016		B18 B19 B21
			33.52-MP				0.375	7/32	1/32	1/8	0.020~0.157	0.006~0.016		
			33.53-MP				0.375	7/32	3/64	1/8	0.031~0.165	0.006~0.020		
	DNMG-VQ	DNMG	33.52-VQ	●		●	0.375	7/32	1/32	1/8	0.012~0.079	0.004~0.014		B18 B19 B21
			33.53-VQ	●		●	0.375	7/32	3/64	1/8	0.014~0.079	0.006~0.018		
S Type	SNMG-HM	SNMG	332-HM	●		●	0.375	3/16	1/32	1/8	0.024~0.138	0.005~0.016		B19 B20 B22
			333-HM	●		●	0.375	3/16	3/64	1/8	0.028~0.138	0.006~0.018		
	SNMG-MP	SNMG	331-MP				0.375	3/16	1/64	1/8	0.016~0.15	0.024~0.016		B19 B20 B22
			332-MP				0.375	3/16	1/32	1/8	0.020~0.157	0.006~0.016		
			334-MP				0.375	3/16	3/64	1/8	0.031~0.165	0.006~0.020		
	SNMG-VQ	SNMG	332-VQ	●		●	0.375	3/16	1/32	1/8	0.012~0.079	0.004~0.014		B19 B20 B22
			333-VQ	●		●	0.375	3/16	3/64	1/8	0.014~0.079	0.006~0.016		

PCLNR/L

CN□□





95°
• R type insert
(inch)

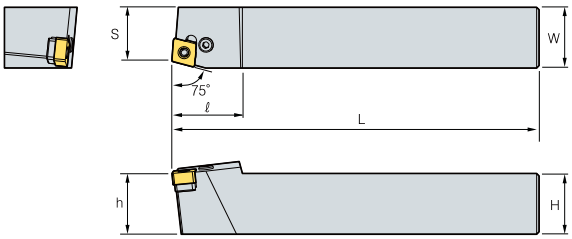
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PCLNR/L	**10-3A-3N**	5/8	5/8	4	0.787	0.625	0.787	CN□□33□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	12-3B-3N	3/4	3/4	4 1/2	1.000	0.787	1.000							
	16-3D-3N	1	1	6	1.250	1.000	1.063							

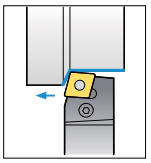
Applicable inserts, see pages **B22**

● : Stock item

PCBNR/L

CN□□





75°
• R type insert
(inch)

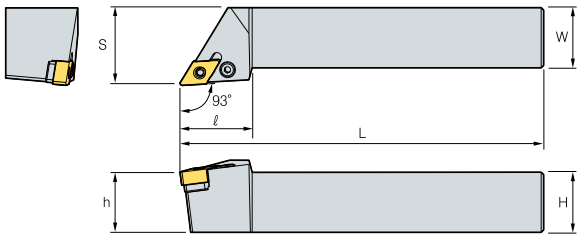
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PCBNR/L	**12-3B-3N**	3/4	3/4	4 1/2	0.669	0.787	1.063	CN□□33□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.142							

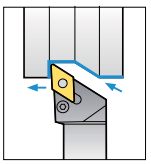
Applicable inserts, see pages **B22**

● : Stock item

PDJNR/L

DN□□





93°
• R type insert
(inch)

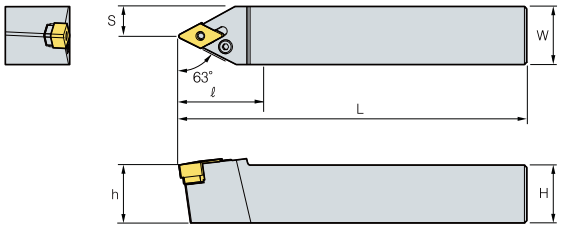
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PDJNR/L	**12-3B-3.5N**	3/4	3/4	4 1/2	1.000	0.787	1.000	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSP3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

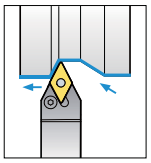
Applicable inserts, see pages **B28**

● : Stock item

PDNNR/L

DN□□





63°

• R type insert

(inch)

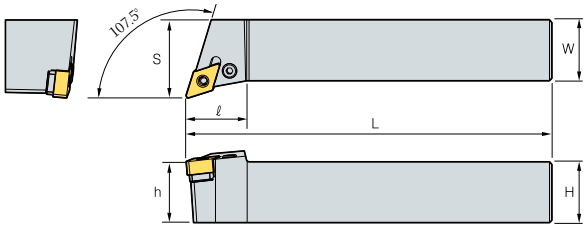
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PDNNR/L	**12-3B-3.5N**	3/4	3/4	4 1/2	1.000	0.787	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

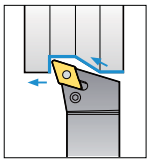
Applicable inserts, see pages **B28**

● : Stock item

PDQNR/L

DN□□





107.5°

• R type insert

(inch)

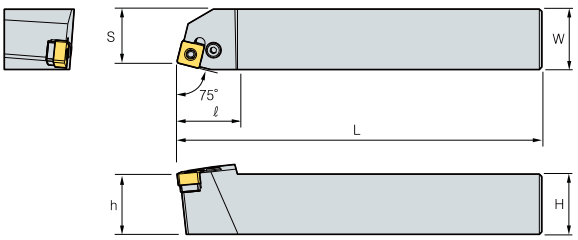
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PDQNR/L	**12-3B-3.5N**	3/4	3/4	4 1/2	1.000	0.787	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

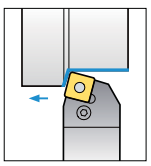
Applicable inserts, see pages **B28**

● : Stock item

PSBNR/L

SN□□





75°

• R type insert

(inch)

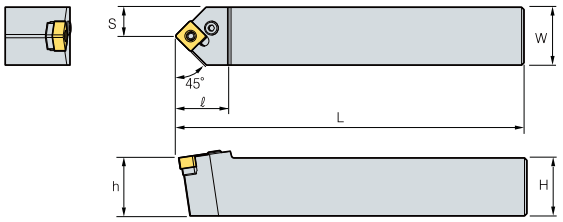
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PSBNR/L	**12-3B-3N**	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

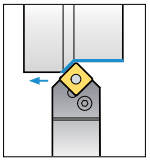
Applicable inserts, see pages **B37**

● : Stock item

PSDNN

SN□□





45°

• R type insert

(inch)

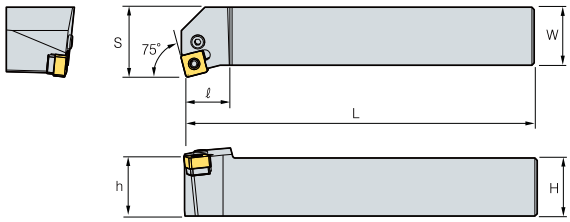
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PSDNN	**12-3B-3N**	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

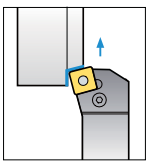
Applicable inserts, see pages **B37**

● : Stock item

PSKNR/L

SN□□





75°

• R type insert

(inch)

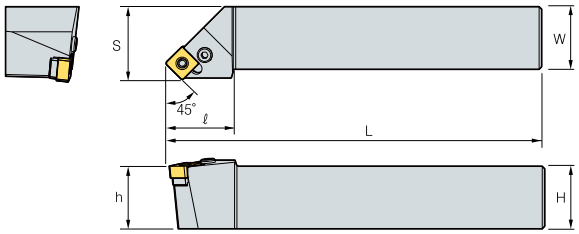
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PSKNR/L	**12-3B-3N**	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

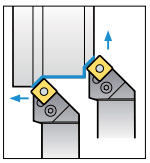
Applicable inserts, see pages **B37**

● : Stock item

PSSNR/L

SN□□





45°

• R type insert

(inch)

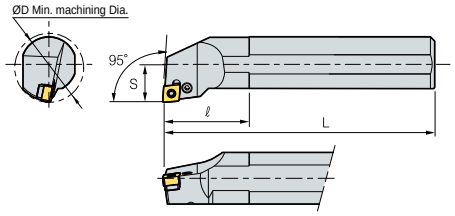
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
PSSNR/L	**12-3B-3N**	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

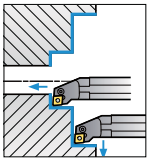
Applicable inserts, see pages **B37**

● : Stock item

PCLNR/L

CN□□





95°

• R type insert

(inch)

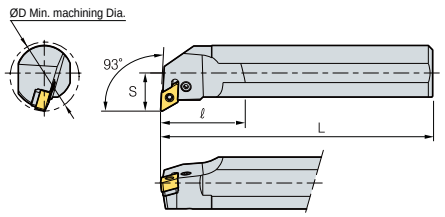
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
S20Q-PCLNR/L-3-3N	1.000	1 1/4	0.709	7	0.512	1.969	CN□□33□□	LV3B	VHX0512B	–	–	HW20L	–
S25R-PCLNR/L-3-3N	1.260	1	0.906	8	0.669	1.969		LV3B	VHX0512B	SC32N	SP3	HW20L	–
S32S-PCLNR/L-3-3N	1.575	2	1.181	10	0.866	1.969		LV3N	VHX0617N	SC32N	SP3	HW25L	–

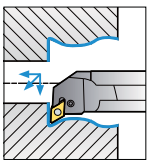
Applicable inserts, see pages **B22**

● : Stock item

PDUNR/L

DN□□





93°

• R type insert

(inch)

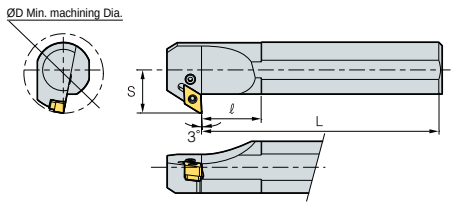
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
S32S-PDUNR/L-3-3.5N	1.575	1	1.181	8	0.866	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDUNR/L-3-3.5N	1.969	2 1/2	1.496	12	1.063	1.969							

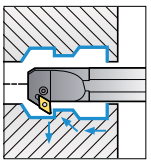
Applicable inserts, see pages **B28**

● : Stock item

PDZNR/L

DN□□





31.5°

• R type insert

(inch)

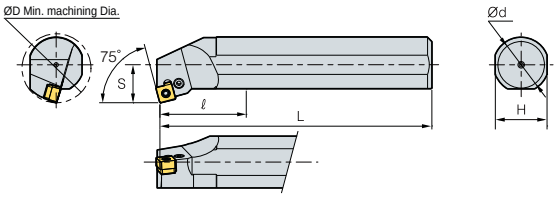
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
S32S-PDZNR/L-3-3.5N	1.575	1	1.181	8	0.866	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDZNR/L-3-3.5N	1.969	2 1/2	1.496	12	1.063	1.969							

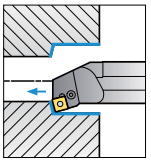
Applicable inserts, see pages **B28**

● : Stock item

PSKNR/L

SN□□





75°

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shimpin punch
S25R-PSKNR/L-3-3N	1.260	1	0.906	8	0.669	1.260	SN□□33□□	LV3B	VHX0512B	–	–	HW20L	–
S32S-PSKNR/L-3-3N	1.575	2	1.181	10	0.866	1.260		LV3N	VHX0617N	SS32N	SP3	HW25L	–

Applicable inserts, see pages **B37**

● : Stock item

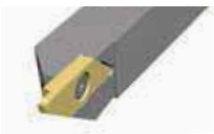
Excellent for precision machining

Auto Tools

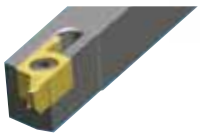
- High precision machining of small parts and complex forms, etc.
- High quality products through stable machining
- Exclusive insert for automatic lathes

Type

ISO



Blade

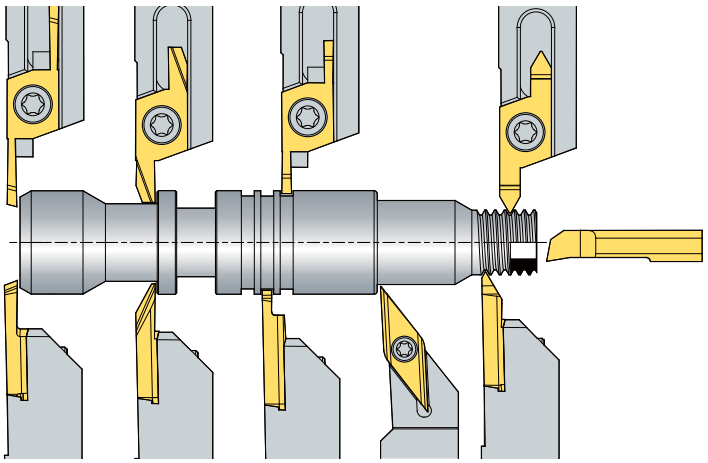


Multi utility

MGT

MSB tools

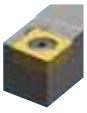
Application example



Index

Specification	① Parting and Grooving						② Back turning		
Holder	SXGNR/L	SXGNR/L	KGEHR/L	SBHR/L	SBHR/L	MGEHR/L	SXGNR/L	SXGNR/L	SBHR/L
Insert	SG	SC	KGMN	SBG	SBC	MGMN	SB	SGB	SBB
Holder size	0.39~0.79inch	0.39~0.79inch	0.39~0.63inch	0.39~0.63inch	0.39~0.63inch	0.39~0.63inch	0.39~0.79inch	0.39~0.79inch	0.39~0.63inch
Insert shape									
Cutting width	0.04~0.12inch	0.04~0.12inch	0.06~0.10inch	0.09~0.08inch	0.09~0.08inch	0.06~0.13inch	0.08~0.16inch	0.08~0.12inch	0.13inch
ØDmax	Ø0.71	Ø0.71	Ø1.26	Ø0.63	Ø0.63	Ø1.26	Tmax 0.32	Tmax 0.34	Tmax 0.32
Page	B183	B183	B186	B180	B180	B186	B183	B183	B180

Specification	③ Threading	
Holder	SXGNR/L	SBHR/L
Insert	ST	SBT
Holder size	0.39~0.79inch	0.39~0.63inch
Insert shape		
Screw ranges	Pitch ranges 0.02~0.06 / 0.06~0.12	Pitch ranges 0.01~0.06 / 0.04~0.08
Insert	B183	B180

Specification	④ External turning and Copy machining				⑤ External turning and Facing		
Holder	SDJCR/L	SDNCN	SVJBR/L	SVJCR/L	SCACR/L	SCLCR/L	STACR/L
Insert	DC□T	DC□T	VB□T	VC□T	CC□T	CC□T	TC□T
Holder size	0.32~0.63inch	0.32~0.63inch	0.39~0.63inch	0.39~0.63inch	0.32~0.63inch	0.32~0.63inch	0.32~0.39inch
Insert shape							
Feature	Offset "0"				Offset "0"		
Page	B171	B172	B172	B173	B171	B171	B172

Specification	⑥ Internal turning(Boring)				
Holder	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L	MSB
Insert	CC□T	TB□T	TP□T	WB□T	-
Shank diameter	Ø0.16~Ø0.39	Ø0.32	Ø0.32	Ø0.20~Ø0.32	Ø0.16~Ø0.24
Insert shape					
ØDmin	Ø0.20	Ø0.32	Ø0.39	Ø0.22	Ø0.09
Page	B150	B150	B150	B150	B187~B193

Auto Tools (ISO type)

- ISO inserts for automatic lathes
- Precise R shape with the use of minus tolerance of nose R
- Tolerance class precise enough in no need for adjusting tools with the use of accurate cutting edge height
- Sharp blade for excellent chip control and surface roughness with low cutting force
- High precision tools for electrical/ electronics instruments and medical instruments

Code system (ISO type)

R : Right
L : Left
N : Neutral

M : Minus

Relief angle	Cross section type	Height of cutting edge	Tolerance of coner R	Hand

V	C	E	T	11	03	01	M	F	R – KM

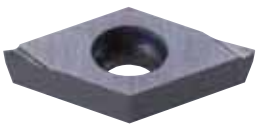
Insert shape	Tolerance	Cutting edge length, diameter of inscribed circle	Nose radius	Condition of cutting edge	Chip breaker

F : Sharpe
E : Honed
T : Land
S : Honed land

KF/KM chip breaker, gound type for grooving

- Ground chip breaker with sharp cutting edge
- High precision insert of E-class tolerance with accurate nose radius

KF



- For finishing
- Low cutting loads with sharp cutting edges
- Longer tool life due to lower chip evacuation resistance at high speed
- Excellent surface roughness

KM

- For medium cutting to finishing
- Better chip flow due to wide chip pockets
- Longer tool life and better cutting action due to improved chip evacuation
- Excellent surface roughness

VP1 chip breaker

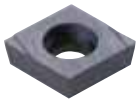
- Exclusive chip breaker for hard-to-cut materials such as titanium alloy, Inconel, stainless steel, etc.
- Minimized cutting heat by reducing contact area between chips and rake surface with the use of high positive blade

VP1

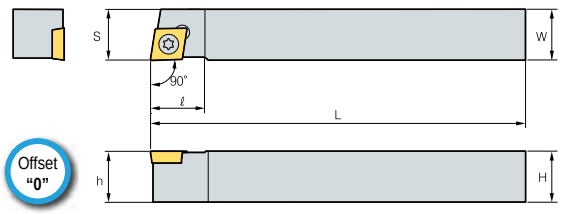
• Sharp cutting edge
- Excellent chip control
- Low cutting resistance
- High precision machining

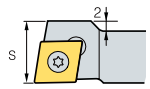
• High positive angle of rake surface
- Chip breaking at low depth of cut
- Stable chip control at high depth of cut
- Wide cutting area available with the use of optimized chip breaker width according to depth of cuts

SCACR/L

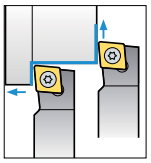


CC□T





※ Only SCACR/L06-X3A is designed as above picture.



90°

• R type insert

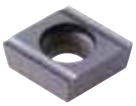
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCACR/L	**05-X2A**	5/16	5/16	4 1/2	0.313	0.313	0.394	CC□T21.5□	FTKA02565	TW07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.394			
	06-X3A	3/8	3/8	4 1/2	0.500	0.500	0.512	CC□T32.5□	FTKA0410	TW15P
	08-X3A	1/2	1/2	4 1/2	0.500	0.500	0.630			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	0.630			

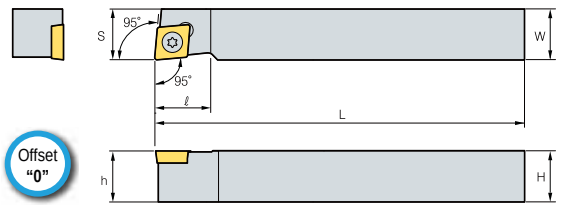
Applicable inserts, see pages **B55 ~ 58, B80**

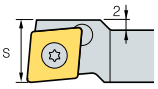
● : Stock item

SCLCR/L

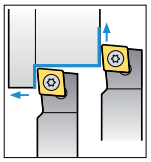


CC□T





※ Only SCLCR/L06-X3A is designed as above picture.



95°

• R type insert

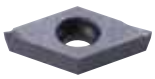
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCLCR/L	**05-X2A**	5/16	5/16	4 1/2	0.313	0.313	0.394	CC□T21.5□	FTKA02565	TW07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.394			
	06-X3A	3/8	3/8	4 1/2	0.500	0.500	0.512	CC□T32.5□	FTKA0410	TW15P
	08-X3A	1/2	1/2	4 1/2	0.500	0.500	0.630			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	0.630			

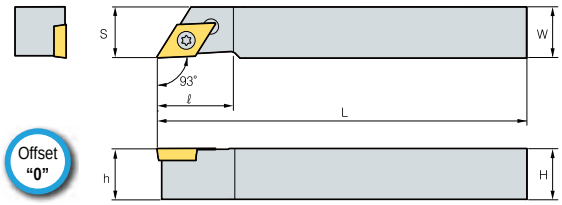
Applicable inserts, see pages **B55 ~ 58, B80**

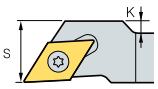
● : Stock item

SDJCR/L

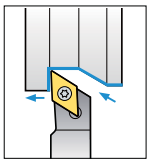


DC□T





※ Only SDJCR/L05-X2A, 06-X3A, 08-X3A is designed as above picture.



93°

• R type insert

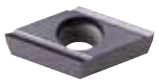
(inch)

Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
SDJCR/L	**05-X2A**	5/16	5/16	4 1/2	0.375	0.313	0.078	0.709	DC□T21.5□	FTKA02565	TW07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	-	0.590			
	06-X3A	3/8	3/8	4 1/2	0.550	0.375	0.157	0.709	DC□T32.5□	FTKA0410	TW15P
	08-X3A	1/2	1/2	4 1/2	0.550	0.500	0.078	0.709			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	-	0.866			

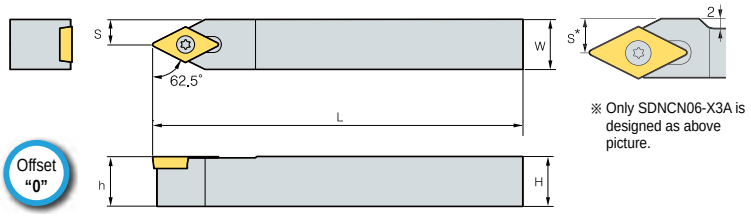
Applicable inserts, see pages **B61 ~ 62, B81**

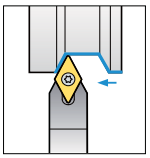
● : Stock item

SDNCN



DC□T





90°

(inch)

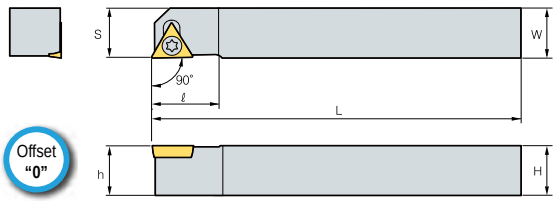
Designation		H	W	L	S	h	Insert	Screw	Wrench
SDNCN	**05-X2A**	5/16	5/16	4 1/2	0.125	0.313	DC□T21.5□	FTKA02565	TW07P
	06-X2A	3/8	3/8	4 1/2	0.158	0.375			
	06-X3A	3/8	3/8	4 1/2	0.276	0.375	DC□T32.5□	FTKA0410	TW15P
	08-X3A	1/2	1/2	4 1/2	0.250	0.500			
	10-X3A	5/8	5/8	4 1/2	0.313	0.625			

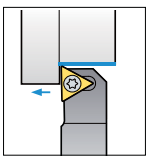
Applicable inserts, see pages **B61 ~ 62, B81**

● : Stock item

STACR/L

TC□T





90°

• R type insert

(inch)

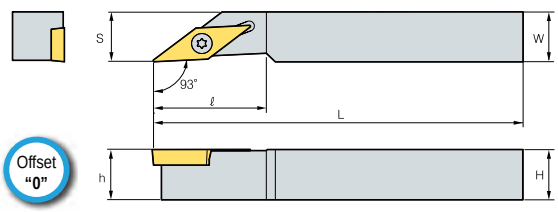
Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
STACR/L	**05-X1.5A**	5/16	5/16	4 1/2	0.313	0.313	0.039	0.472	TC□T1.51.5□	FTNA0206	TW06P
	06-X1.5A	3/8	3/8	4 1/2	0.375	0.375	0.118	0.472			

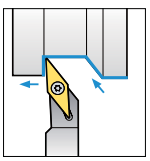
Applicable inserts, see pages **B68**

● : Stock item

SVJBR/L

VB□T





93°

• R type insert

(inch)

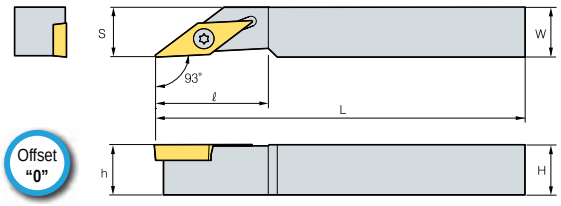
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJBR/L	**06-X2A**	3/8	3/8	4 1/2	0.375	0.375	0.866	VB□T22□	FTKA02565	TW07P
	08-X2A	1/2	1/2	4 1/2	0.500	0.500	0.866			
	10-X2A	5/8	5/8	4 1/2	0.625	0.625	0.945			

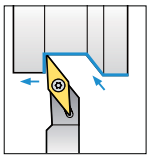
Applicable inserts, see pages **B73 ~ B74, B85**

● : Stock item

SVJCR/L

VC□T





93°
• R type insert
(inch)

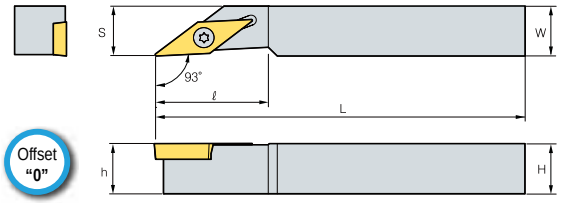
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJCR/L	**06-X2A**	3/8	3/8	4 1/2	0.375	0.375	0.866	VC□T22□	FTKA02565	TW07P
	08-X2A	1/2	1/2	4 1/2	0.500	0.500	0.866			
	10-X2A	5/8	5/8	4 1/2	0.625	0.625	0.945			

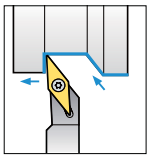
Applicable inserts, see pages **B75 ~ 76, B86**

● : Stock item

SVJPR/L

VP□T





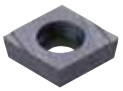
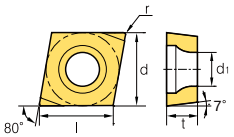
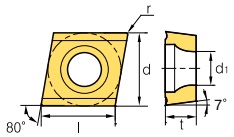
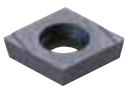
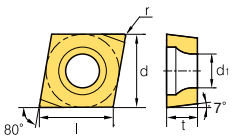
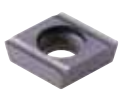
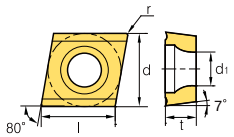
93°
• R type insert
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJCR/L	**06-X2A**	3/8	3/8	4 1/2	0.375	0.375	0.866	VP□T22□	FTKA02565	TW07P
	08-X2A	1/2	1/2	4 1/2	0.500	0.500	0.866			
	10-X2A	5/8	5/8	4 1/2	0.625	0.625	0.945			

Applicable inserts, see pages **B75 ~ 76, B86**

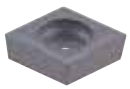
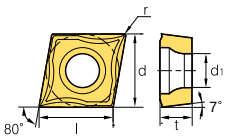
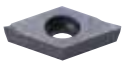
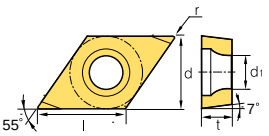
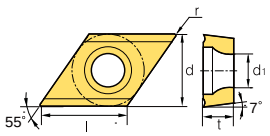
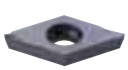
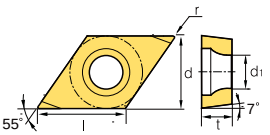
● : Stock item

Insert

Insert	Designation	Coated				Uncoated	Dimensions (inch)					Cutting condition		Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	fn (ipr)	ap (inch)	
CCET-KF (New)  Finishing (High precision)	21.5MFR-KF						0.260	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFR-KF			●			0.252	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFR-KF			●			0.244	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFR-KF						0.386	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFR-KF			●			0.378	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFR-KF			●			0.362	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5MFL-KF						0.260	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFL-KF						0.252	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFL-KF						0.244	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFL-KF						0.386	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFL-KF						0.378	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFL-KF						0.362	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
CCET-KM (New)  Medium to finishing (High precision)	21.5MFR-KM						0.260	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFR-KM			●			0.252	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFR-KM			●			0.244	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFR-KM						0.386	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFR-KM			●			0.378	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFR-KM			●			0.362	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5MFL-KM						0.260	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFL-KM						0.252	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFL-KM						0.244	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFL-KM						0.386	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFL-KM						0.378	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFL-KM						0.362	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
CCGT-KF  Finishing (High precision)	21.5R-KF						0.256	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50R-KF						0.256	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5R-KF						0.256	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5R-KF						0.382	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50R-KF						0.382	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5R-KF						0.382	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5L-KF						0.256	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50L-KF						0.256	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5L-KF						0.256	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5L-KF						0.382	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50L-KF						0.382	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5L-KF						0.382	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
CCGT-KM  Medium to finishing (High precision)	21.5R-KM						0.256	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50R-KM						0.256	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5R-KM						0.256	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5R-KM						0.382	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50R-KM						0.382	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5R-KM						0.382	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5L-KM						0.256	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50L-KM						0.256	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5L-KM						0.256	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5L-KM						0.382	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50L-KM						0.382	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5L-KM						0.382	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	

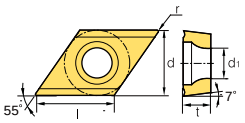
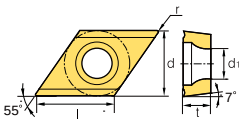
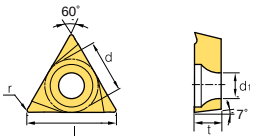
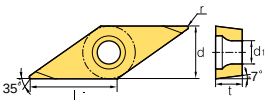
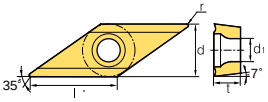
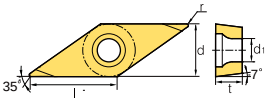
● : Stock item

Insert

Insert	Designation	Coated				Uncoated	Dimensions (inch)					Cutting condition		Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	fn (ipr)	ap (inch)	
CCGT-VP1 (New)  Finishing (High precision)	21.50-VP1	●	●	●	●	●	0.252	1/4	3/32	1/256	7/64	0.002~0.003	0.002~0.039	
	21.50.5-VP1	●	●	●		●	0.244	1/4	3/32	1/128	7/64	0.001~0.004	0.003~0.059	
	21.51-VP1	●	●	●	●	●	0.236	1/4	3/32	1/64	7/64	0.002~0.005	0.004~0.059	
	32.50-VP1	●	●	●	●	●	0.378	3/8	5/32	1/256	11/64	0.001~0.005	0.002~0.039	
	32.50.5-VP1	●	●	●	●		0.346	3/8	5/32	1/64	11/64	0.002~0.008	0.004~0.059	
	32.51-VP1	●	●	●	●	●	0.362	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.059	
	21.50MFN-VP1			●			0.26	1/4	3/32	1/256	7/64	~0.002	0.002~0.051	
	21.50.5MFN-VP1			●			0.252	1/4	3/32	1/128	7/64	0.002~0.003	0.002~0.039	
	21.51MFN-VP1			●			0.244	1/4	3/32	1/64	7/64	0.002~0.004	0.003~0.059	
	32.50MFN-VP1			●			0.386	3/8	5/32	1/256	11/64	0.005~0.005	0.004~0.059	
	32.50.5MFN-VP1			●			0.378	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.059	
	32.51MFN-VP1			●			0.362	3/8	5/32	1/64	11/64	0.005~0.008	0.004~0.059	
DCET-KF (New)  Finishing (High precision)	21.5MFR-KF						0.307	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFR-KF			●			0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFR-KF			●			0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFR-KF						0.457	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFR-KF			●			0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFR-KF			●			0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5MFL-KF						0.307	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFL-KF			●			0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFL-KF						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFL-KF						0.457	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFL-KF						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFL-KF						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
DCET-KM (New)  Medium to finishing (High precision)	21.5MFR-KM						0.307	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFR-KM			●			0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFR-KM			●			0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFR-KM						0.457	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFR-KM			●			0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFR-KM			●			0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5MFL-KM						0.307	1/4	3/32	1/512	7/64	~0.002	0.002~0.051	
	21.50MFL-KM						0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5MFL-KM						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.067	
	32.5MFL-KM						0.457	3/8	5/32	1/512	11/64	0.001~0.003	0.002~0.059	
	32.50MFL-KM						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5MFL-KM						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
DCGT-KF  Finishing (High precision)	21.5R-KF						0.307	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50R-KF						0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5R-KF						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.059	
	32.5R-KF						0.457	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50R-KF						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5R-KF						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5L-KF						0.307	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50L-KF						0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5L-KF						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.059	
	32.5L-KF						0.457	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50L-KF						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5L-KF						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	

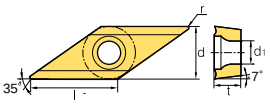
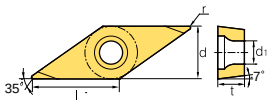
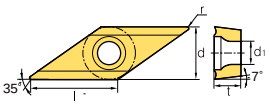
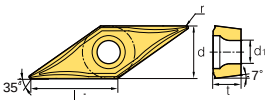
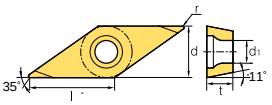
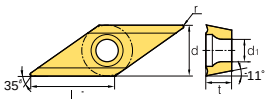
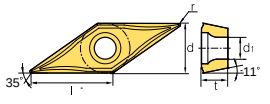
● : Stock item

Insert

Insert	Designation	Coated				Uncoated	Dimensions (inch)					Cutting condition		Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	fn (ipr)	ap (inch)	
DCGT-KM  Finishing (High precision)	21.5R-KM						0.307	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50R-KM						0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5R-KM						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.059	
	32.5R-KM						0.457	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50R-KM						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5R-KM						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
	21.5L-KM						0.307	1/4	3/32	S.P	7/64	~0.002	0.002~0.051	
	21.50L-KM						0.307	1/4	3/32	1/256	7/64	0.001~0.003	0.002~0.059	
	21.50.5L-KM						0.307	1/4	3/32	1/128	7/64	0.001~0.004	0.002~0.059	
	32.5L-KM						0.457	3/8	5/32	S.P	11/64	0.001~0.003	0.002~0.059	
	32.50L-KM						0.457	3/8	5/32	1/256	11/64	0.001~0.004	0.002~0.067	
	32.50.5L-KM						0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.079	
DCGT-VP1  Finishing (High precision)	21.50-VP1	●		●		●	0.307	1/4	3/32	1/256	7/64	0.001~0.002	0.002~0.039	
	21.50.5-VP1	●	●	●	●	●	0.295	1/4	3/32	1/128	7/64	0.001~0.004	0.003~0.059	
	21.51-VP1	●	●	●			0.287	1/4	3/32	1/64	7/64	0.002~0.005	0.004~0.059	
	32.50-VP1	●		●			0.457	3/8	5/32	1/256	11/64	0.001~0.005	0.002~0.039	
	32.50.5-VP1	●		●		●	0.449	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.059	
	32.51-VP1	●	●	●	●	●	0.441	3/8	5/32	1/64	11/64	0.002~0.008	0.004~0.059	
	21.50MFN-VP1			●			0.307	1/4	3/32	1/256	7/64	0.002~0.003	0.002~0.039	
	21.50.5MFN-VP1			●			0.307	1/4	3/32	1/128	7/64	0.002~0.004	0.003~0.059	
	21.51MFN-VP1			●			0.307	1/4	3/32	1/64	7/64	0.002~0.005	0.004~0.059	
	32.50MFN-VP1			●			0.457	3/8	5/32	1/256	11/64	0.002~0.005	0.002~0.039	
	32.50.5MFN-VP1			●			0.457	3/8	5/32	1/128	11/64	0.002~0.006	0.003~0.059	
	32.51MFN-VP1			●			0.457	3/8	5/32	1/64	11/64	0.005~0.008	0.004~0.059	
TCGT-KF  Finishing (High precision)	1.51.5R-KF						0.321	3/16	3/32	S.P	3/32	~0.002	0.002~0.051	
	1.51.50R-KF						0.314	3/16	3/32	1/256	3/32	0.001~0.003	0.002~0.059	
	1.51.50.5R-KF						0.304	3/16	3/32	1/128	3/32	0.001~0.004	0.002~0.067	
	1.51.5L-KF						0.321	3/16	3/32	S.P	3/32	~0.002	0.002~0.051	
	1.51.50L-KF						0.314	3/16	3/32	1/256	3/32	0.001~0.003	0.002~0.059	
	1.51.50.5L-KF						0.304	3/16	3/32	1/128	3/32	0.001~0.004	0.002~0.067	
VBGT-KF  Finishing (High precision)	22R-KF						0.433	1/4	1/8	S.P	1/9	~0.002	0.002~0.051	
	220R-KF						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5R-KF						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22L-KF						0.433	1/4	1/8	S.P	7/64	~0.002	0.002~0.051	
	220L-KF						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5L-KF						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
VBGT-KM  Medium to finishing (High precision)	22R-KM						0.433	1/4	1/8	S.P	7/64	~0.002	0.002~0.051	
	220R-KM						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5R-KM						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22L-KM						0.433	1/4	1/8	S.P	7/64	~0.002	0.002~0.051	
	220L-KM						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5L-KM						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
VCET-KF  Finishing (High precision)	22MFR-KF						0.433	1/4	1/8	1/512	7/64	0.001~0.002	0.002~0.051	
	220MFR-KF			●			0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5MFR-KF			●			0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22MFL-KF						0.433	1/4	1/8	1/512	7/64	0.001~0.002	0.002~0.051	
	220MFL-KF						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5MFL-KF						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	

● : Stock item

Insert

Insert	Designation	Coated				Uncoated	Dimensions (inch)					Cutting condition		Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	fn (ipr)	ap (inch)	
New VCET-KM  Medium to finishing (High precision)	22MFR-KM						0.433	1/4	1/8	1/512	7/64	0.001~0.002	0.002~0.051	
	220MFR-KM			●			0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5MFR-KM			●			0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22MFL-KM						0.433	1/4	1/8	1/512	7/64	0.001~0.002	0.002~0.051	
	220MFL-KM						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5MFL-KM						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
VCGT-KF  Finishing (High precision)	22R-KF						0.433	1/4	1/8	S.P	7/64	0.001~0.002	0.002~0.051	
	220R-KF						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5R-KF						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22L-KF						0.433	1/4	1/8	S.P	7/64	0.001~0.002	0.002~0.051	
	220L-KF						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5L-KF						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
VCGT-KM  Medium to finishing (High precision)	22R-KM						0.433	1/4	1/8	S.P	7/64	0.001~0.002	0.002~0.051	
	220R-KM						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5R-KM						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
	22L-KM						0.433	1/4	1/8	S.P	7/64	0.001~0.002	0.002~0.051	
	220L-KM						0.433	1/4	1/8	1/256	7/64	0.001~0.003	0.002~0.059	
	220.5L-KM						0.433	1/4	1/8	1/128	7/64	0.001~0.005	0.002~0.067	
New VCGT-VP1  Finishing (High precision)	220-VP1	●	●	●	●	●	0.433	1/4	1/8	1/256	7/64	0.001~0.006	0.002~0.006	
	220.5-VP1	●	●	●	●	●	0.433	1/4	1/8	1/128	7/64	0.001~0.007	0.004~0.039	
	221-VP1	●	●	●	●	●	0.433	1/4	1/8	1/64	7/64	0.001~0.007	0.006~0.047	
	220MFN-VP1			●			0.433	1/4	1/8	1/256	7/64	0.001~0.006	0.002~0.006	
	220.5MFN-VP1			●			0.433	1/4	1/8	1/128	7/64	0.001~0.007	0.004~0.039	
	221MFN-VP1			●			0.433	1/4	1/8	1/64	7/64	0.001~0.007	0.006~0.047	
New VPET-KF  Finishing (High precision)	63013MFR-KF						0.315	3/16	3/32	1/512	6/64	0.001~0.002	0.002~0.059	
	630MFR-KF			●			0.315	3/16	3/32	1/256	6/64	0.001~0.003	0.002~0.059	
	630.5MFR-KF			●			0.315	3/16	3/32	1/128	6/64	0.001~0.005	0.002~0.067	
	63013MFL-KF						0.315	3/16	3/32	1/512	6/64	0.001~0.002	0.002~0.059	
	630MFL-KF			●			0.315	3/16	3/32	1/256	6/64	0.001~0.003	0.002~0.059	
	630.5MFL-KF			●			0.315	3/16	3/32	1/128	6/64	0.001~0.005	0.002~0.067	
New VPET-KM  Medium to finishing (High precision)	63013MFR-KM						0.315	3/16	3/32	1/512	6/64	0.001~0.002	0.002~0.059	
	630MFR-KM			●			0.315	3/16	3/32	1/256	6/64	0.001~0.003	0.002~0.059	
	630.5MFR-KM			●			0.315	3/16	3/32	1/128	6/64	0.001~0.005	0.002~0.067	
	63013MFL-KM						0.315	3/16	3/32	1/512	6/64	0.001~0.002	0.002~0.059	
	630MFL-KM			●			0.315	3/16	3/32	1/256	6/64	0.001~0.003	0.002~0.059	
	630.5MFL-KM			●			0.315	3/16	3/32	1/128	6/64	0.001~0.005	0.002~0.067	
New VPGT-VP1  Finishing (High precision)	220-VP1	●	●	●	●	●	0.433	1/4	1/8	1/256	7/64	0.001~0.006	0.002~0.006	
	220.5-VP1	●	●	●	●	●	0.433	1/4	1/8	1/128	7/64	0.001~0.007	0.004~0.039	
	221-VP1	●	●	●	●	●	0.433	1/4	1/8	1/64	7/64	0.001~0.007	0.006~0.047	
	220MFN-VP1			●			0.433	1/4	1/8	1/256	7/64	0.001~0.006	0.002~0.006	
	220.5MFN-VP1			●			0.433	1/4	1/8	1/128	7/64	0.001~0.007	0.004~0.039	
	221MFN-VP1			●			0.433	1/4	1/8	1/64	7/64	0.001~0.007	0.006~0.047	

● : Stock item

Auto tools (Blade type) New

- Blade insert for automatic lathes
- For external machining of precise small parts
- 4 types - SSB(for back turning), SGB(for grooving), SBT(for threading), SBC(for parting off)
- Convenient use of one holder to all blade inserts
- Exclusive holder for close cutting action to the sub spindle

Code system of Auto tools insert (Blade type)

Turnung operation (Back turning)

SB	B	R	25	005
Small blade	Back turning	Hand	Length of insert	Nose radius
		R : Right **L** : Left		

Grooving

SB	G	R	25	20
Small blade	Grooving	Hand	Length of insert	Width of cutting edge
		R : Right **L** : Left		

Threading

SB	T	R	25	60	–	N	–	010
Small blade	Threading	Hand	Length of insert	Angle of thread		Hand of thread		Nose radius
		R : Right **L** : Left				**R** : Right **L** : Left **N** : None		

Parting

SB	C	R	25	20	16	–	N
Small blade	Cut off / Parting	Hand	Length of insert	Width of cutting edge	Max. machining diameter		Hand of thread
		R : Right **L** : Left					**R** : Right **L** : Left **N** : None **T** : C/B none

Code system of Auto tools holder (Blade type)

SB	H	R	10	10	–	K25	–	X
Small blade	Holder	Hand	Height of shank	Width of shank		Length of insert		Sub spindle
		R : Right **L** : Left						

Types of blade insert

Possible to apply various types of blade inserts to one holder

SBB : For back turning

- Approach angle : 59°
- Max. cutting depth : 0.157inch
- Nose R : 0.002, 0.004, 0.008inch

SBG : For grooving

- Width : 0.02~0.1inch
- Nose R : 0.002inch

SBT : For threading

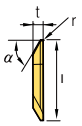
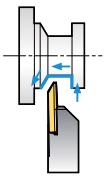
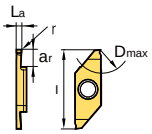
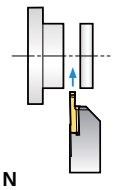
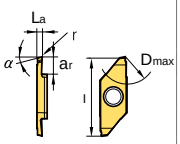
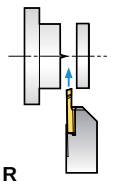
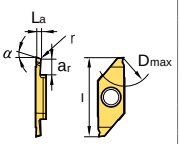
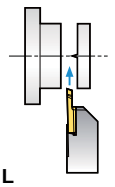
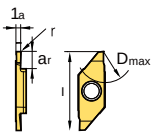
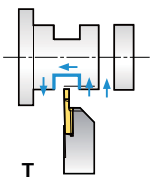
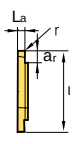
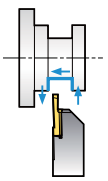
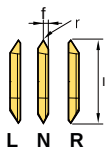
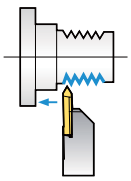
- V profile : 60°
- Pitch : 0.008~0.04inch
- Nose R : 0.002inch

SBC : For parting off

- Cutting width : 0.028~0.079inch
- D Max. : 0.63inch
- Nose R : 0.002inch

Insert

(inch)

Application	Picture	Designation		Coated PC8110 R	Coated PC8110 L	Dimensions (inch) l	α°	t	r	La	ar	f	D-MAX	Pitch range Min.	Pitch range Max.	Configuration	Feed direction
Back turning	 SBBR/L	SBBR/L	25005	●		0.984	59°	0.125	0.002	-	-	-	-	-	-		
			25010	●		0.984	59°	0.125	0.004	-	-	-	-	-	-		
			25020	●		0.984	59°	0.125	0.008	-	-	-	-	-	-		
Parting off	 SBCR/L	SBCR/L	250708-N			0.984	0°	-	0.002	0.028	0.169	-	0.315	-	-		 N
			251012-N			0.984	0°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-N			0.984	0°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-N	●		0.984	0°	-	0.002	0.079	0.335	-	0.630	-	-		
			250708-R			0.984	15°	-	0.002	0.028	0.169	-	0.315	-	-		 R
			251012-R	●		0.984	15°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-R			0.984	15°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-R	●		0.984	15°	-	0.002	0.079	0.335	-	0.630	-	-		
			250708-L	●		0.984	15°	-	0.002	0.028	0.169	-	0.315	-	-		 L
			251012-L	●		0.984	15°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-L			0.984	15°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-L	●		0.984	15°	-	0.002	0.079	0.335	-	0.630	-	-		
			251012-T	●		0.984	0°	-	0.002	0.039	0.248	-	0.472	-	-		 T
			251512-T	●		0.984	0°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-T	●		0.984	0°	-	0.002	0.079	0.335	-	0.630	-	-		
Grooving	 SBGR/L	SBGR/L	2505	●		0.984	0°	-	0.002	0.020	0.053	-	-	-	-		
			2510	●		0.984	0°	-	0.002	0.039	0.108	-	-	-	-		
			2515	●		0.984	0°	-	0.002	0.059	0.148	-	-	-	-		
			2520	●		0.984	0°	-	0.002	0.079	0.148	-	-	-	-		
			2525	●		0.984	0°	-	0.002	0.098	0.148	-	-	-	-		
Threading	 SBTR/L	SBTR/L	2560-N-005	●		0.984	-	-	0.002	-	-	0.063	-	0.008	0.079	 L N R	
			2560-N-010	●		0.984	-	-	0.004	-	-	0.063	-	0.039	0.079		
			2560-R-005	●		0.984	-	-	0.002	-	-	0.024	-	0.008	0.059		
			2560-R-010	●		0.984	-	-	0.004	-	-	0.024	-	0.039	0.059		
			2560-L-005	●		0.984	-	-	0.002	-	-	0.024	-	0.008	0.059		
			2560-L-010	●		0.984	-	-	0.004	-	-	0.024	-	0.039	0.059		

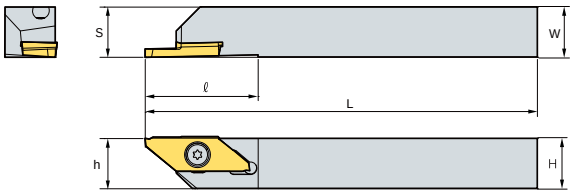
● : Stock item

SBHR/L

For Back turning, Part off, Thread-all in one

SBBR SBGR
SBTR SBCR

Offset "0"



(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SBHR/L	**06-K25**	3/8	3/8	4 1/2	0.394	0.394	1.063	SB□R/L25	FTKA0409S	T9
	08-K25	1/2	1/2	4 1/2	0.472	0.472	1.063			
	10-K25	5/8	5/8	4 1/2	0.630	0.630	1.063			

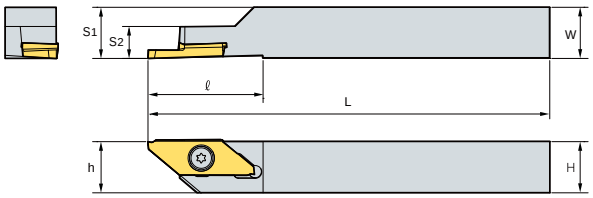
● : Stock item

SBHR/L-X

For sub spindle parting

SBBR SBGR
SBTR SBCR

Offset "0"



(inch)

Designation		H	W	L	S_1	S_2	h	ℓ	Insert	Screw	Wrench
SBHR/L	**06-K25-X**	3/8	3/8	4 1/2	0.394	0.295	0.394	1.063	SB□R/L25	FTKA0407S	T9
	08-K25-X	1/2	1/2	4 1/2	0.472	0.295	0.472	1.063			

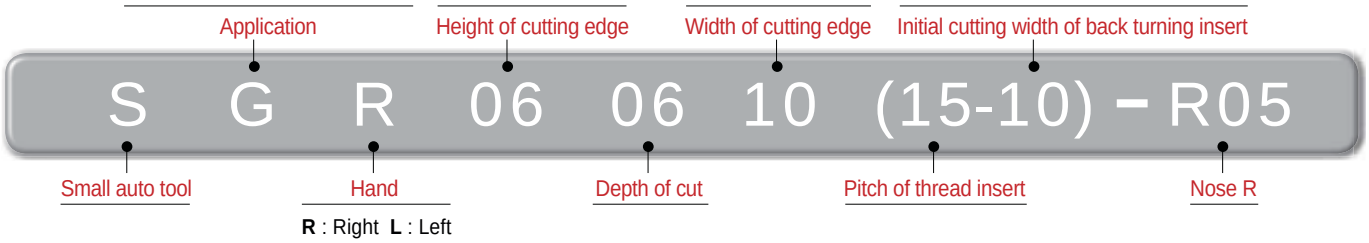
● : Stock item

Auto tools (For multi utility)

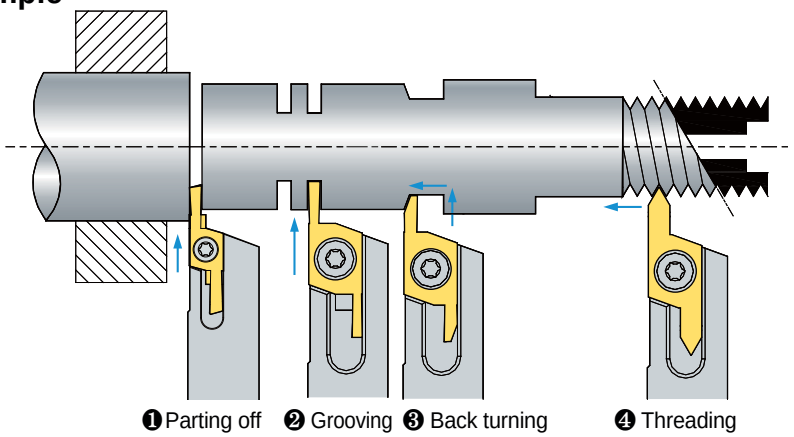
- ▶ Multifunctional insert for automatic lathes
- ▶ For external machining of precise small parts
- ▶ 5 types - SB(for back turning), SG(for grooving), ST(for threading), SC(for parting off), SGB(for grooving and back turning)
- ▶ Convenient use of one holder to all inserts
- ▶ Offset "0" to all ISO type holders

Insert code system (Multi utility type)

B : Back turning **G** : Grooving
C : Parting off **T** : Threading
GB : Grooving & Back-turning

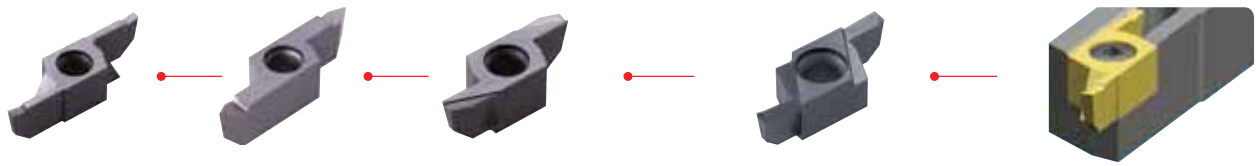


Application example



Types of multifunctional insert

Possible to apply various types of blade inserts to one holder (Ex: All designations of 06 size inserts can be applied to one 06 size holder.)

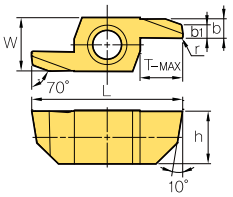
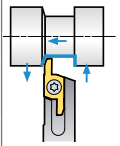
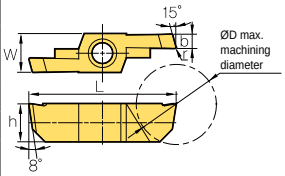
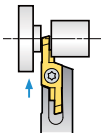
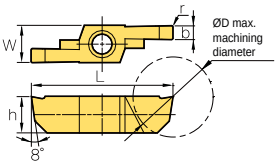
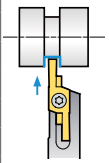


SG : Grooving | **ST : Threading** | **SB : Back turning** | **SGB : Grooving and back turning** | **SC : Parting off**

Recommended cutting conditions

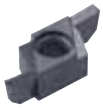
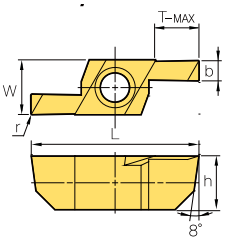
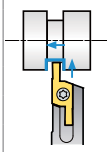
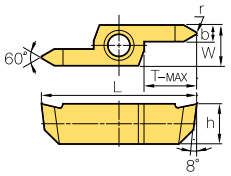
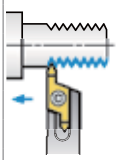
Workpiece	Turning		Grooving		Parting off		Back turning	
	Cutting speed, vc(sfm)	Feed, fn(ipr)	Cutting speed, vc(sfm)	Feed, fn(ipr)	Cutting speed, vc(sfm)	Feed, fn(ipr)	Cutting speed, vc(sfm)	Feed, fn(ipr)
Stainless steel	160~400	0.0008~0.0079	100~400	0.0008~0.0020	160~400	0.0008~0.0020	100~400	0.0008~0.0079
Carbon steel	160~490	0.0004~0.0098	160~490	0.0008~0.0031	160~490	0.0008~0.0031	160~490	0.0004~0.0098
Free cutting steel	100~490	0.0008~0.0098	100~490	0.0008~0.0031	100~490	0.0008~0.0031	100~490	0.0004~0.0098
Non ferrous metal	230~660	0.0012~0.0098	230~660	0.0012~0.0039	230~660	0.0012~0.0039	230~660	0.0012~0.0118

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	Dimensions (inch) b1	b	W	L	r	h	T-MAX	ØD	Configuration	Feed direction
Back turning	SBR/L	SBR/L	060520-10-R00			0.039	0.079	0.315	0.866	S.P	0.236	0.217	-		
			060520-10-R05			0.039	0.079	0.315	0.866	0.002	0.236	0.217	-		
			060520-10-R10			0.039	0.079	0.315	0.866	0.004	0.236	0.217	-		
			060630-20-R00			0.079	0.118	0.315	0.945	S.P	0.236	0.256	-		
			060630-20-R05			0.079	0.118	0.315	0.945	0.002	0.236	0.256	-		
			060630-20-R10			0.079	0.118	0.315	0.945	0.004	0.236	0.256	-		
			080630-20-R00			0.079	0.118	0.315	0.906	S.P	0.315	0.256	-		
			080630-20-R05			0.079	0.118	0.315	0.906	0.002	0.315	0.256	-		
			080630-20-R10			0.079	0.118	0.315	0.906	0.004	0.315	0.256	-		
			080840-20-R00			0.079	0.157	0.315	1.063	S.P	0.315	0.335	-		
			080840-20-R05			0.079	0.157	0.315	1.063	0.002	0.315	0.335	-		
			080840-20-R10			0.079	0.157	0.315	1.063	0.004	0.315	0.335	-		
Parting off	SCR/L	SCR/L	060610-R00			-	0.039	0.315	0.945	S.P	0.236	-	0.433		
			060610-R05	●		-	0.039	0.315	0.945	0.002	0.236	-	0.433		
			060610-R10	●		-	0.039	0.315	0.945	0.004	0.236	-	0.433		
			060615-R00			-	0.059	0.315	0.945	S.P	0.236	-	0.433		
			060615-R05	●		-	0.059	0.315	0.945	0.002	0.236	-	0.433		
			060615-R10	●		-	0.059	0.315	0.945	0.004	0.236	-	0.433		
			060620-R00			-	0.079	0.315	0.945	S.P	0.236	-	0.433		
			060620-R05	●		-	0.079	0.315	0.945	0.002	0.236	-	0.433		
			060620-R10	●		-	0.079	0.315	0.945	0.004	0.236	-	0.433		
			081015-R00			-	0.059	0.315	1.220	S.P	0.315	-	0.709		
			081015-R05			-	0.059	0.315	1.220	0.002	0.315	-	0.709		
			081015-R10			-	0.059	0.315	1.220	0.004	0.315	-	0.709		
			081020-R00			-	0.079	0.315	1.220	S.P	0.315	-	0.709		
			081020-R05			-	0.079	0.315	1.220	0.002	0.315	-	0.709		
			081020-R10	●		-	0.079	0.315	1.220	0.004	0.315	-	0.709		
			081025-R00			-	0.098	0.315	1.220	S.P	0.315	-	0.709		
			081025-R05	●		-	0.098	0.315	1.220	0.002	0.315	-	0.709		
			081025-R10	●		-	0.098	0.315	1.220	0.004	0.315	-	0.709		
			081030-R00			-	0.118	0.315	1.220	S.P	0.315	-	0.709		
			081030-R05	●		-	0.118	0.315	1.220	0.002	0.315	-	0.709		
			081030-R10			-	0.118	0.315	1.220	0.004	0.315	-	0.709		
Grooving	SGR/L	SGR/L	060610-R00			0.039	0.315	0.945	S.P	0.236	-	0.433	-		
			060610-R05	●		0.039	0.315	0.945	0.002	0.236	-	0.433	-		
			060610-R10	●		0.039	0.315	0.945	0.004	0.236	-	0.433	-		
			060615-R00			0.059	0.315	0.945	S.P	0.236	-	0.433	-		
			060615-R05	●		0.059	0.315	0.945	0.002	0.236	-	0.433	-		
			060615-R10	●		0.059	0.315	0.945	0.004	0.236	-	0.433	-		
			060620-R00			0.079	0.315	0.945	S.P	0.236	-	0.433	-		
			060620-R05	●		0.079	0.315	0.945	0.002	0.236	-	0.433	-		
			060620-R10	●		0.079	0.315	0.945	0.004	0.236	-	0.433	-		
			081015-R00			0.059	0.315	1.220	S.P	0.315	-	0.709	-		
			081015-R05			0.059	0.315	1.220	0.002	0.315	-	0.709	-		
			081015-R10			0.059	0.315	1.220	0.004	0.315	-	0.709	-		
			081020-R00			0.079	0.315	1.220	S.P	0.315	-	0.709	-		
			081020-R05	●		0.079	0.315	1.220	0.002	0.315	-	0.709	-		
			081020-R10			0.079	0.315	1.220	0.004	0.315	-	0.709	-		
			081025-R00			0.098	0.315	1.220	S.P	0.315	-	0.709	-		
			081025-R05			0.098	0.315	1.220	0.002	0.315	-	0.709	-		
			081025-R10			0.098	0.315	1.220	0.004	0.315	-	0.709	-		
			081030-R00			0.118	0.315	1.220	S.P	0.315	-	0.709	-		
			081030-R05			0.118	0.315	1.220	0.002	0.315	-	0.709	-		
			081030-R10			0.118	0.315	1.220	0.004	0.315	-	0.709	-		

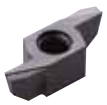
● : Stock item

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	b	W	L	r	h	T-MAX	ØD	Pitch	Configuration	Feed direction
Grooving and back turning	SGBR/L 	SGBR/L	**0604520-R00**			0.079	0.315	0.866	S.P	0.236	0.217	-	-		
			0604520-R05			0.079	0.315	0.866	0.002	0.236	0.217	-	-		
			0604520-R10			0.079	0.315	0.866	0.004	0.236	0.217	-	-		
			0604525-R00			0.098	0.315	0.866	S.P	0.236	0.217	-	-		
			0604525-R05			0.098	0.315	0.866	0.002	0.236	0.217	-	-		
			0604525-R10			0.098	0.315	0.866	0.004	0.236	0.217	-	-		
			0605530-R00			0.118	0.315	0.945	S.P	0.236	0.256	-	-		
			0605530-R05			0.118	0.315	0.945	0.002	0.236	0.256	-	-		
			0605530-R10			0.118	0.315	0.945	0.004	0.236	0.256	-	-		
			0805525-R00			0.098	0.315	0.945	S.P	0.315	0.276	-	-		
			0805525-R05			0.098	0.315	0.945	0.002	0.315	0.276	-	-		
			0805525-R10			0.098	0.315	0.945	0.004	0.315	0.276	-	-		
			0806530-R00			0.118	0.315	1.024	S.P	0.315	0.315	-	-		
			0806530-R05			0.118	0.315	1.024	0.002	0.315	0.315	-	-		
			0806530-R10			0.118	0.315	1.024	0.004	0.315	0.315	-	-		
Threading	STR/L 	STR/L	**06073215**			0.126	0.315	0.984	0.002	0.236	0.276	-	0.5-1.5		
			06073230			0.126	0.315	0.984	0.007	0.236	0.276	-	1.5-3.0		
			08103215			0.126	0.315	1.220	0.002	0.315	0.413	-	0.5-1.5		
			08103230			0.126	0.315	1.220	0.007	0.315	0.143	-	1.5-3.0		

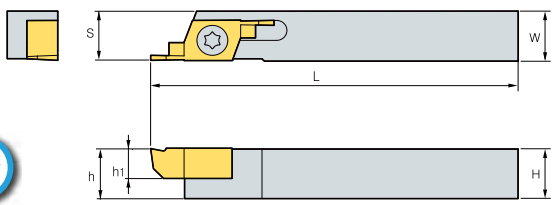
● : Stock item

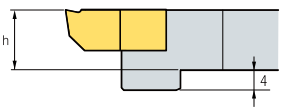
SXGNR/L



SBR, SGBR
SCR, STR, SGR

Offset "0"





· Only SXGNR/L08-X8A is designed as above picture.

• R type insert

(inch)

Designation		H	W	L	S	h	h_1	Insert	Screw	Wrench
SXGNR/L	**06-X6A**	3/8	3/8	4 1/2	0.375	0.375	0.236	S□R/L 06	FTNA0408	TW15P
	08-X6A	1/2	1/2	4 1/2	0.472	0.500	0.236			
	10-X6A	5/8	5/8	4 1/2	0.625	0.625	0.236			
	12-X6A	3/4	3/4	4 1/2	0.750	0.750	0.236			
	08-X8A	1/2	1/2	4 1/2	0.500	0.500	0.315	S□R/L 08	FTNA0411	TW15P
	10-X8A	5/8	5/8	4 1/2	0.625	0.625	0.315			
	12-X8A	3/4	3/4	4 1/2	0.750	0.750	0.315			

● : Stock item

Auto tools (KGT/MGT type)

- ▶ Grooving insert for automatic lathes
- ▶ Exclusive holder for automatic lathes
- ▶ Economic double sided insert
- ▶ Strong clamping system secures stable machining and precision.
- ▶ A wide selection of chip breakers according to various cutting conditions such as low/high feed, continuous/interrupted machining, etc.

Insert code system (KGT/MGT type)

KG M N 300 - 04 - T

KG SYSTEM	Tolerance	Hand	Width of cutting edge	Nose radius	Chip breaker
(KORLOY Grooving)	**M** : class **G** : class	**N** : Neutrality **R** : Right **L** : Light **I** : Internal	0.079~0.315 inch	1/128 inch 3/256 inch 1/64 inch 1/32 inch	L / R / T / C / LP / RP / B

Holder code system (KGT/MGT type)

KG E H R/L 16 - 3 - T15

KG SYSTEM	Working style	Holder style	Hand	Shank size	Cutting width	Maximum depth
(KORLOY Grooving)	**E** : External process **I** : Internal process	**H** : Horizontal **V** : Vertical **U** : Undercut	**R** : Right **L** : Light	Height 1 inch Width 1 inch (For Internal machining : Minimum diameter for machining), Shank diameter	0.079~0.315 inch	0.315~1.417 inch

Chip breaker line-up

[KGT type]

KGMN-L

- Sharp cutting edge
- For low feed machining
- For small diameter parts

KGMN-R

- Reinforced cutting edge
- For high feed machining
- For interrupted cutting

KGMN-T

- Sharp cutting edge
- Stronger chip control
- For turning and grooving

KGMR/L-LP

- Sharp cutting edge
- For low feed machining
- Small diameter component
- Right / Left handed
- Low carbon steel

KGMR/L-RP

- Strong cutting edge
- For high feed machining
- For iInterrupted cutting
- Right / Left handed

KRMN-C

- Improved chip control
- Copying
- Relief

[MGT type]

MGM(G)N-M

- Easier chip control by narrowing chip width with the use of chip breaker on rake surface center
- Smooth chip flow by small dots in external machining
- Available for both external machining and grooving

MGMN-G

- Specially designed chip breaker allows narrower chips to promote better chip flow with the use of center dots
- Exclusive chip breaker for grooving

KGT Insert

Application	Picture	Designation		Coated NC3220	NC3225	NC5330	PC5300	PC9030	Dimensions (inch) b	r	l	d	α°	Configuration
Grooving	KGMN-L	KGMN	200-02-L	●	●	●	●	●	0.079	1/128	0.787	0.067	-	
			300-02-L	●	●	●	●	●	0.118	1/128	0.787	0.091	-	
Grooving·Parting off	KGMN-R	KGMN	200-02-R	●	●	●	●	●	0.079	1/128	0.787	0.067	-	
			300-02-R	●	●	●	●	●	0.118	1/128	0.787	0.091	-	
Grooving·turning	KGMN-T	KGMN	200-02-T	●	●	●	●	●	0.079	1/128	0.787	0.067	-	
			300-02-T	●	●	●	●	●	0.118	1/128	0.787	0.091	-	
			300-04-T	●	●	●	●	●	0.118	1/64	0.787	0.091	-	
Parting off (left handed)	KGMR-LP	KGMR	200-6D-LP			●	●		0.079	1/128	0.787	0.067	6	
			200-15D-LP			●	●		0.079	1/128	0.787	0.067	15	
			300-6D-LP			●	●		0.118	1/128	0.787	0.091	6	
			300-15D-LP			●	●		0.118	1/128	0.787	0.091	15	
Parting off (right handed)	KGMR-RP	KGMR	200-6D-RP			●	●		0.079	1/128	0.787	0.067	6	
			200-15D-RP			●	●		0.079	1/128	0.787	0.067	15	
			300-6D-RP			●	●		0.118	1/128	0.787	0.091	6	
			300-15D-RP			●	●		0.118	1/128	0.787	0.091	15	
Grooving·turning	KGML-LP	KGML	200-6D-LP						0.079	1/128	0.787	0.067	6	
			200-15D-LP						0.079	1/128	0.787	0.067	15	
			300-6D-LP						0.118	1/128	0.787	0.091	5	
			300-15D-LP						0.118	1/128	0.787	0.091	16	
Parting off (left handed)	KGML-RP	KGML	200-6D-RP						0.079	1/128	0.787	0.067	6	
			200-15D-RP						0.079	1/128	0.787	0.067	15	
			300-6D-RP						0.118	1/128	0.787	0.091	6	
			300-15D-RP						0.118	1/128	0.787	0.091	15	
Parting off (right handed)	KRMN-C	KRMN	200-C		●	●	●		0.079	3/64	0.787	0.067	-	
			300-C		●	●	●		0.118	1/14	0.787	0.087	-	

● : Stock item

MGT Insert

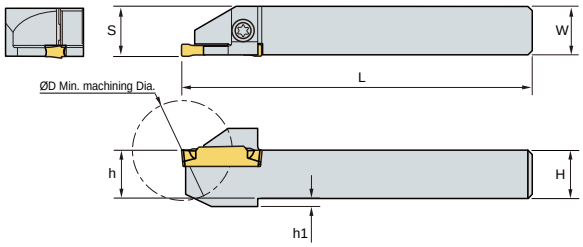
Application	Picture	Designation		Coated NC3120	NC3220	NC5330	NC3030	PC5300	PC9030	Uncoated H01	G10	U20	Dimensions (inch) b	r	l	d	t	Configuration
Grooving / Parting off	MGMN	MGMN	150-G		●		●	●	●	●			0.059	0.006	0.630	0.047	0.138	
			200-G	●	●		●		●	●			0.079	0.008	0.630	0.047	0.138	
			200-M		●		●	●	●				0.079	0.008	0.630	0.047	0.138	
			250-G	●	●	●	●	●	●	●			0.098	0.008	0.728	0.079	0.152	
			250-M	●	●		●	●	●				0.098	0.008	0.728	0.079	0.152	

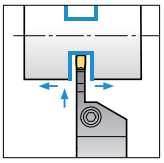
● : Stock item

KGEHR/L-D00A

For Grooving, Turning, Parting off

KGGN KGMN
KGMR/L KRMN





• R type insert

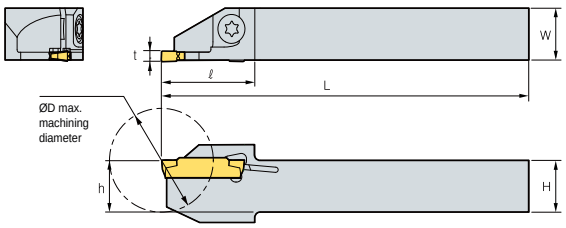
(inch)

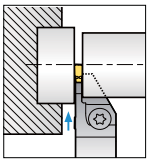
Designation		H=(h)	W	L	S	h_1	ØD Max	Insert	Screw	Wrench
KGEHR/L	**06-2-D20A**	3/8	3/8	5	0.383	0.079	0.787	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	08-2-D25A	1/2	1/2	5	0.508	0.079	0.984			
	10-2-D32A	5/8	5/8	5	0.633	-	1.260			
	08-3-D25A	1/2	1/2	5	0.508	0.079	0.984			
	10-3-D32A	5/8	5/8	5	0.633	-	1.260	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□		

● : Stock item

MGEHR/L

MGMN





• R type insert

(inch)

Designation		ØD	H=h	W	L	ℓ	t	Insert	Screw	Wrench
MGEHR/L	**06-X15A**	0.787	3/8	3/8	4.5	0.709	0.059	MGMN150-G	ETNA0412	TW15L
	08-X15A	0.984	1/2	1/2	4.5	0.768	0.059			
	06-X20A	0.787	3/8	3/8	4.5	0.709	0.079	MGMN200-M MGMN200-G	ETNA0412	TW15L
	08-X20A	0.984	1/2	1/2	4.5	0.768	0.079			
	10-X20A	1.260	5/8	5/8	4.5	0.984	0.079			
	06-X25A	0.787	3/8	3/8	4.5	0.787	0.098	MGMN250-M MGMN250-G	ETNA0412	TW15L
	08-X25A	0.984	1/2	1/2	4.5	0.787	0.098			
	10-X25A	1.260	5/8	5/8	4.5	0.984	0.098			

● : Stock item

Auto tool (MSB tool)

- High hardness grade guarantees longer tool life.
- Various kinds of machining(Fitting, Valve, Medical parts, Automobile component, and Semiconductor equipment) are available.
- Various types of MSB tools (Boring, Grooving, Threading)

Code System

Application

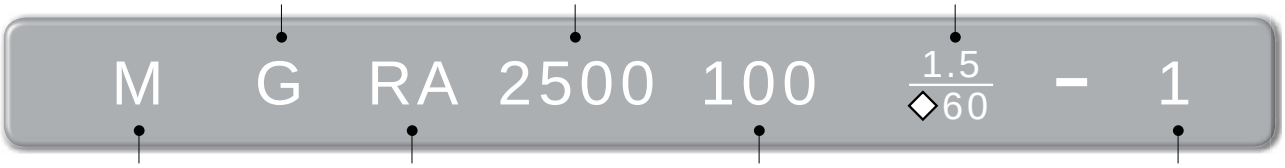
B : Boring
BC : Copying
BB : Back Boring
BF : Chamfering
G : Square Grooning
GR : Round Grooving
GF : Face Grooving
T : Threading

Shank Dia.

1250 : 0.1250
1875 : 0.1875
2500 : 0.2500
3125 : 0.3125
4375 : 0.4375

Machining size

Boring		No Code	
Copying		Width of Groove	
Threading		60° Pitch	55° tpi
◇	F	0.25~1.0	72~24
	A	0.5~1.5	48~16
	AG	0.5~3.0	48~8



Type

M : Micro

Hand

RA : Right
LA : Left

Max. aspect ratio

038 : 0.38
063 : 0.63
075 : 0.75
100 : 1.00
138 : 1.38

Cutting edge

1 : Single ended
None : Double ended

MSB tool code system

Types		Application		Designation
01	Boring	Boring		MBR/L○○☆☆
02		Copying		MBCR/L○○☆☆
03		Back Boring		MBBR/L○○☆☆
04		Chamfering		MBFR/L○○☆☆
05	Grooving	Square Grooning		MGR/L○○☆☆-□□
06		Round Grooving		MGRR/L○○☆☆-□□
07		Face Grooving		MGFR/L○○00-□□
08	Threading	Partial	60°	MTR/L○○☆☆-◇60
			55°	MTR/L○○☆☆-◇55

Details

Marks					
	○○	Shank Dia.			
	☆☆	Max. depth of boring			
	□□	Width of groove			
	◇	Pitch / tpi	F	0.25~1.0	72~24
			A	0.5~1.5	48~16
			AG	0.5~3.0	48~8

Grades

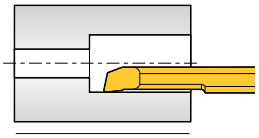
Grades	Coating	Application and features
Z12M	Carbide	Ultra fine grain substrate ensures superior wear resistance and toughness. Application: Cast iron, Aluminum alloy and Non-ferrous metals machining
PC30M	TiN coating	TiN coated ultra fine grain substrate ensures long tool life. Application: Stainless steel, heat resisting alloy and hard-to-cut material machining

Machining Types

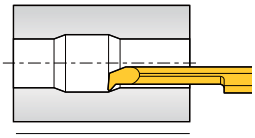


Types

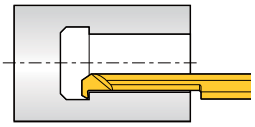
Boring



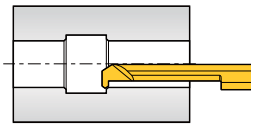
Boring
Min. dia. of machining : Ø0.13



Copying
Min. dia. of machining : Ø0.20

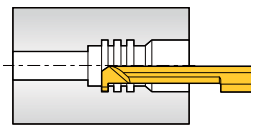


Back Boring
Min. dia. of machining : Ø0.13

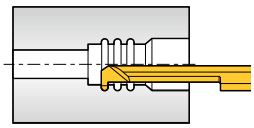


Chamfering
Min. dia. of machining : Ø0.20

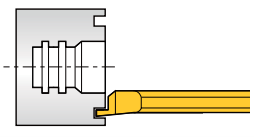
Grooving



Square Grooving
Min. dia. of machining : Ø0.13

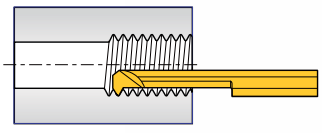


Round Grooving
Min. dia. of machining : Ø0.13



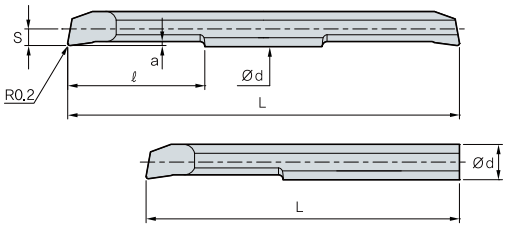
Face Grooving
Min. dia. of machining : Ø0.27

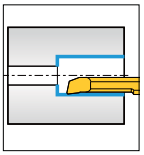
Threading



Threading
Min. dia. of machining : Ø0.13

Boring





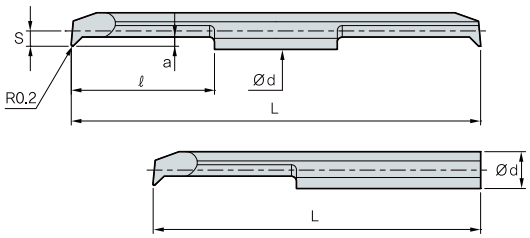
(mm)

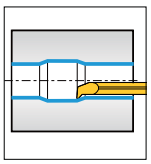
Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	ℓ	Overall length L		Detailed cutting edge a	S
							Double ended	Single ended		
MBR	0310	MBR	0310-1	3.0	3.2	10	40	35	0.5	1.4
	0315		0315-1			15	50	45		
	0410		0410-1	4.0	4.2	10	40	35	0.6	1.9
	0415		0415-1			15	50	45		
	0420		0420-1			20	60	50		
	0610		0610-1	6.0	6.2	10	45	40	0.75	2.9
	0615		0615-1			15	55	45		
	0620		0620-1			20	65	50		
	0810		0810-1	8.0	8.2	10	50	45	0.8	3.9
	0820		0820-1			20	70	60		
	0830		0830-1			30	80	70		
	1015		1015-1	10.0	10.2	15	60	60	1.0	4.9
	1025		1025-1			25	80	70		
	1035		1035-1			35	100	80		

M This is metric size. We can also provide in inch type

● : Stock item

Copying





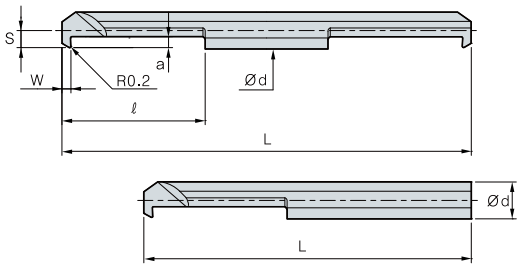
(mm)

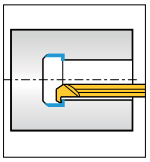
Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	ℓ	Overall length L		Detailed cutting edge a	S
							Double ended	Single ended		
MBCR	0410	MBCR	0410-1	4.0	4.2	10	40	35	1.0	1.9
	0415		0415-1			15	50	45		
	0420		0420-1			20	60	50		
	0610		0610-1	6.0	6.2	10	45	40	1.3	2.9
	0615		0615-1			15	55	45		
	0620		0620-1			20	60	50		

M This is metric size. We can also provide in inch type

● : Stock item

Back Boring





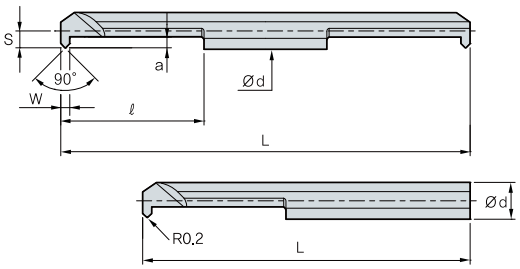
(mm)

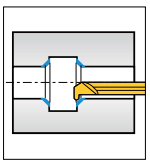
Double ended		Single Edge		Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation		Designation					L		W	a	S
							Double ended	Single ended			
MBBR	0310	MBBR	0310-1	3.0	3.2	10	40	35	1.5	0.8	1.4
	0315		0315-1			15	50	45			
	0410		0410-1	4.0	4.2	10	40	35	2.0	1.3	1.9
	0415		0415-1			15	50	45			
	0420		0420-1			20	60	50			
	0610		0610-1	6.0	6.2	10	45	40	2.0	1.9	2.9
	0615		0615-1			15	55	45			
	0620		0620-1			20	65	50			

M This is metric size. We can also provide in inch type

● : Stock item

Chamfering





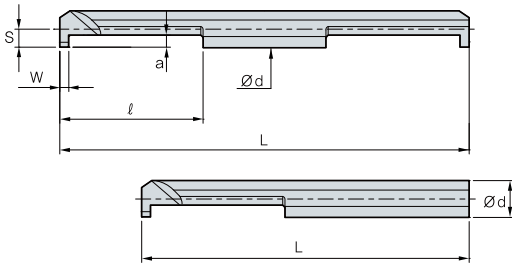
(mm)

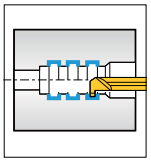
Twin Edge		Single Edge		Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation		Designation					L		W	a	S
							Double ended	Single ended			
MBFR	0410	MBFR	0410-1	4.0	4.2	10	40	35	0.8	1.0	1.9
	0415		0415-1			15	50	45			
	0420		0420-1			20	60	50			
	0610		0610-1	6.0	6.2	10	45	40	1.4	1.2	2.9
	0615		0615-1			15	55	45			
	0620		0620-1			20	65	50			

M This is metric size. We can also provide in inch type

● : Stock item

Square Grooving





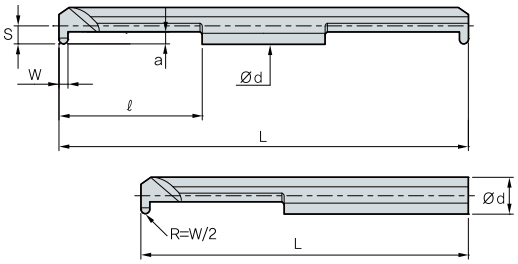
(mm)

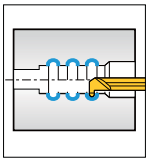
Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	ℓ	Overall length L		Detailed cutting edge W	a	S
							Double ended	Single ended			
MGR	0310-1.0	MGR	0310-1.0-1	3.0	3.2	10	40	35	1.0	0.8	1.4
	0315-1.0		0315-1.0-1			15	50	45			
	0310-1.5		0310-1.5-1			10	40	35	1.5		
	0315-1.5		0315-1.5-1			15	50	45			
	0410-1.0		0410-1.0-1	4.0	4.2	10	40	35	1.0	1.4	1.9
	0420-1.0		0420-1.0-1			20	60	50			
	0410-1.5		0410-1.5-1			10	40	35	1.5		
	0420-1.5		0420-1.5-1			20	60	50			
	0410-2.0		0410-2.0-1			10	40	35	2.0		
	0420-2.0		0420-2.0-1			20	60	50			
	0610-1.0		0610-1.0-1	6.0	6.2	10	45	40	1.0	1.8	2.9
	0620-1.0		0620-1.0-1			20	65	50			
	0610-1.5		0610-1.5-1			10	45	40	1.5		
	0620-1.5		0620-1.5-1			20	65	50			
	0610-2.0		0610-2.0-1			10	45	40	2.0		
	0620-2.0		0620-2.0-1			20	65	50			
	0610-2.5		0610-2.5-1			10	45	40	2.5	2.0	
	0620-2.5		0620-2.5-1			20	65	50			
	0820-1.5		0820-1.5-1	8.0	8.2	20	70	60	1.5	2.5	3.9
	0820-2.0		0820-2.0-1						2.0		
	0820-2.5		0820-2.5-1						2.5	3.5	
	0820-3.0		0820-3.0-1						3.0		
	1025-1.5		1025-1.5-1	10.0	10.2	25	80	70	1.5	2.5	4.9
	1025-2.0		1025-2.0-1						2.0		
	1025-2.5		1025-2.5-1						2.5	3.5	
	1025-3.0		1025-3.0-1						3.0		

M This is metric size. We can also provide in inch type

● : Stock item

Round Grooving





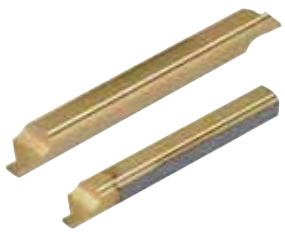
(mm)

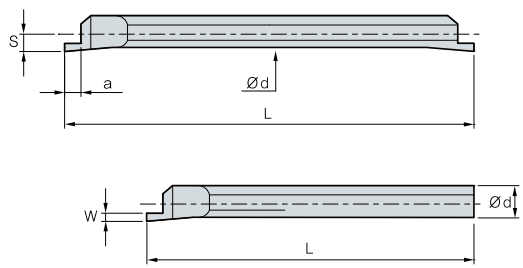
Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	ℓ	Overall length L		Detailed cutting edge		
							Double ended	Single ended	W	a	S
MGRR	0310-0.8	MGRR	0310-0.8-1	3.0	3.2	10	40	35	0.8	0.8	1.4
	0315-0.8		0315-0.8-1			15	50	45			
	0410-1.0		0410-1.0-1	4.0	4.2	10	40	35	1.0	1.0	1.9
	0420-1.0		0420-1.0-1			20	60	50			
	0610-1.0		0610-1.0-1	6.0	6.2	10	45	40	1.0	2.0	2.9
	0620-1.0		0620-1.0-1			20	65	50			
	0610-1.5		0610-1.5-1			10	45	40	1.5		
	0620-1.5		0620-1.5-1			20	65	50			
	0610-2.0		0610-2.0-1			10	45	40	2.0		
	0620-2.0		0620-2.0-1			20	65	50			
	0820-1.0		0820-1.0-1	8.0	8.2	20	70	60	1.0	2.3	3.9
	0820-1.5		0820-1.5-1						1.5		
	0820-2.0		0820-2.0-1						2.0		
	1025-1.0		1025-1.0-1	10.0	10.2	25	80	70	1.0	2.8	4.9
	1025-1.5		1025-1.5-1						1.5		
	1025-2.0		1025-2.0-1						2.0		

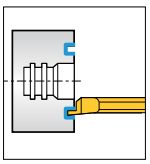
M This is metric size. We can also provide in inch type

● : Stock item

Face Grooving







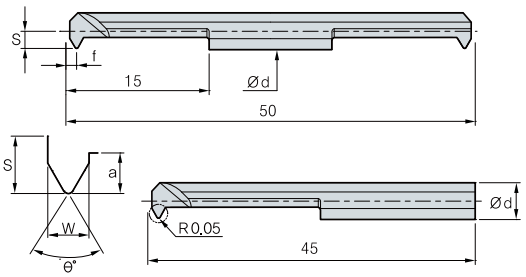
(mm)

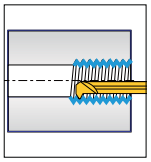
Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	Overall length L		Detailed cutting edge		
						Double ended	Single ended	W	a	S
MGFR	0400-1.0	MGFR	0400-1.0-1	4.0	6.0	50	45	1.0	1.5	1.8
	0400-1.5		0400-1.5-1					1.5	2.0	
	0600-1.0		0600-1.0-1	6.0	8.5	50	45	1.0	1.5	2.9
	0600-1.5		0600-1.5-1					1.5	2.0	
	0600-2.0		0600-2.0-1					2.0	2.5	
	0800-1.0		0800-1.0-1	8.0	10.4	70	60	1.0	1.5	3.9
	0800-1.5		0800-1.5-1					1.5	2.0	
	0800-2.0		0800-2.0-1					2.0	2.5	
	1000-2.0		1000-2.0-1	10.0	12.4	80	70	2.0	2.5	4.9
	1000-2.5		1000-2.5-1					2.5	3.0	
	1000-3.0		1000-3.0-1					3.0	3.5	
	1000-3.5		1000-3.5-1					3.5	4.0	
	1000-4.0		1000-4.0-1					4.0	4.5	
	1000-4.5		1000-4.5-1					4.5	5.0	

M This is metric size. We can also provide in inch type

● : Stock item

Threading





(mm)

Twin Edge Designation		Single Edge Designation		Ød	Min.dia. of machining	Threading W	Threading Pitch / tpi	Threading θ°	Detailed cutting edge S	Detailed cutting edge a	Detailed cutting edge f
MTR	0315-F60	MTR	0315-F60-1	3.0	3.3	1.2	0.5~1.0	60°	1.45	1.2	0.6
	0415-F60		0415-F60-1	4.0	4.3				1.95		
	0615-A60		0615-A60-1	6.0	6.2	2.0	0.5~1.5		2.90	2.2	1.0
	0315-F55		0315-F55-1	3.0	3.3	1.2	48~24	55°	1.45	1.2	0.6
	0415-F55		0415-F55-1	4.0	4.3				1.95		
	0615-A55		0615-A55-1	6.0	6.2	2.0	28~16		2.9	2.2	1.0

M This is metric size. We can also provide in inch type

● : Stock item

SLEEVE

SL(SLEEVE)

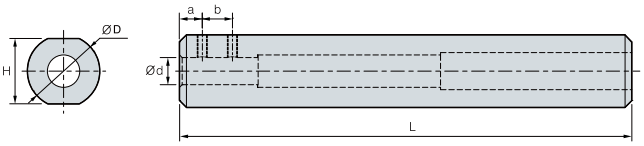


Fig.1

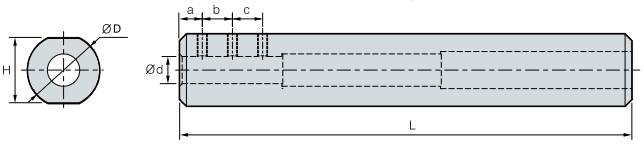


Fig.2

(mm)

Designation	Ød	a	b	c	ØD	H	L	Screw	Wrench	Fig.
SL1603	3	5	-	-	16	14	100	M3	HW15L	1
SL1604	4	5	6	-	16	14	100	M4	HW20L	
SL1605	5	5	8	-	16	14	100	M4	HW20L	
SL1606	6	5	6	6	16	14	100	M4	HW20L	2
SL1607	7	5	6	8	16	14	100	M4	HW20L	
SL2008	8	5	10	10	20	18	100	M4	HW20L	2
SL2010	10	5	10	10	20	18	100	M5	HW20L	

※ Fine tolerance and surface roughness

● : Stock item

M This is metric size. We can also provide in inch type

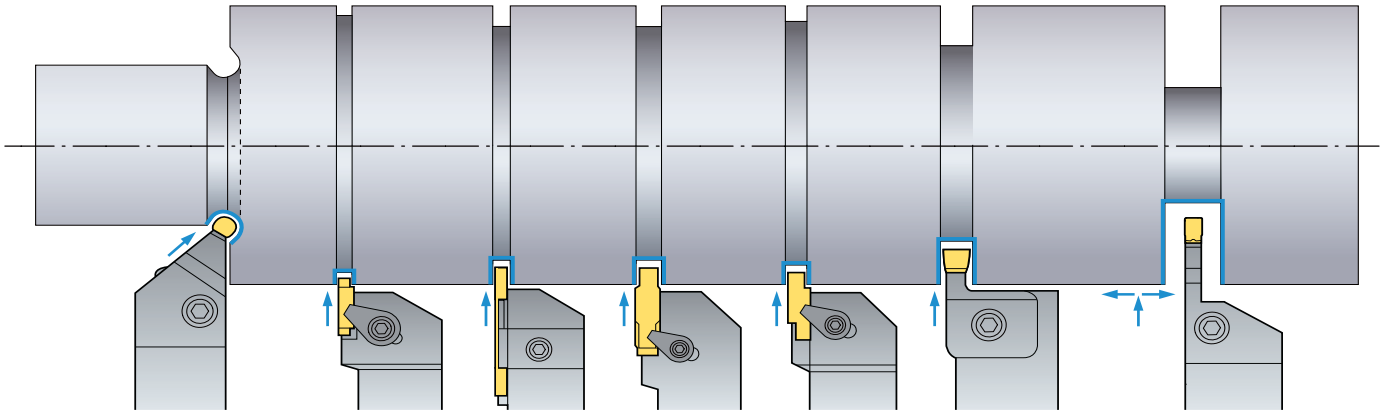
C

MULTI FUNCTIONAL TOOLS

Korloy Multi-functional tool can maching grooving, part-off, facing and forming in various applications. It design ensures superior machinability and productivity.

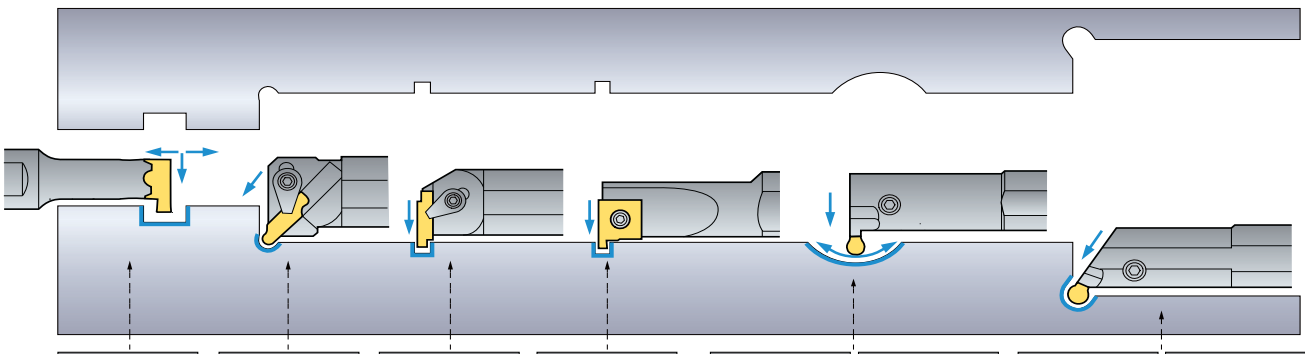
MULTI FUNCTIONAL TOOLS

For external machining



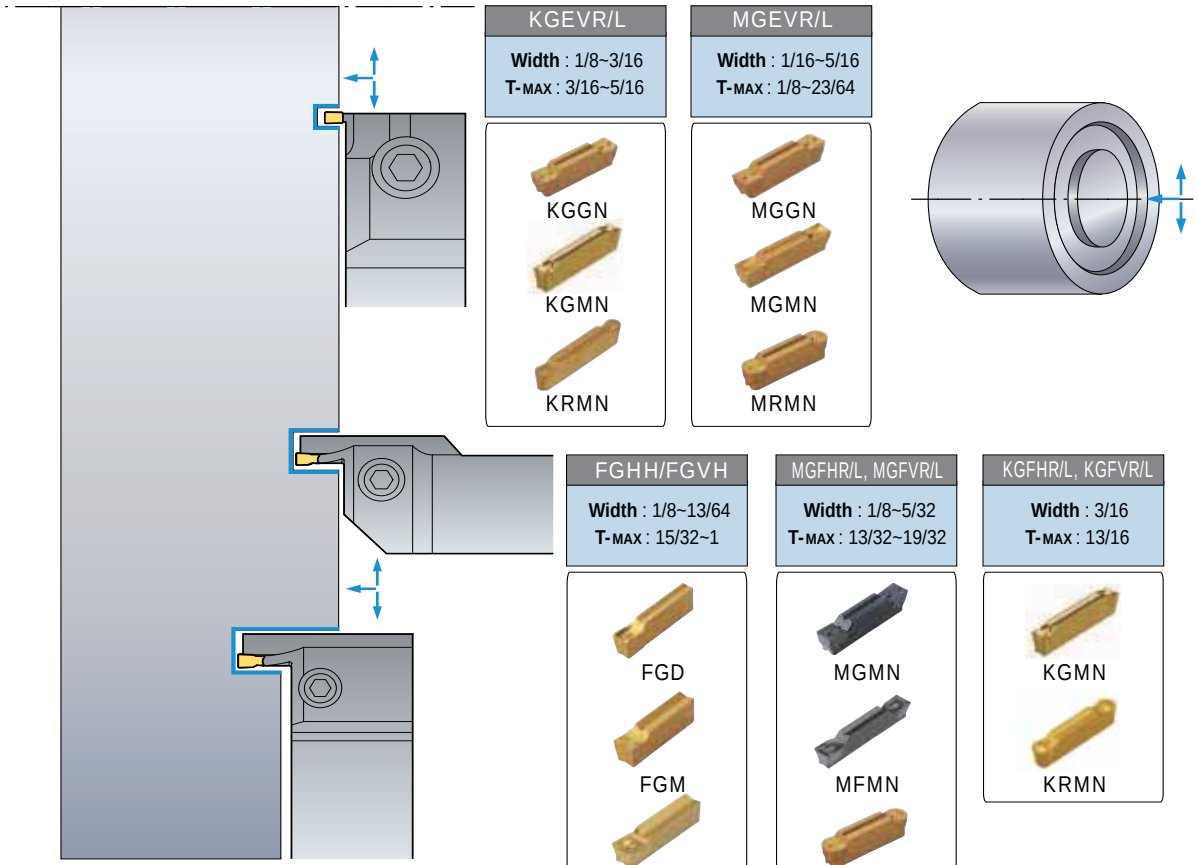
KGEUR/L	MGEUR/L	TBH	PH	GH	GFT	DBH	KGEHR/L	MGEHR/L
Width : 1/16~5/16 **T-MAX** : 1/8	**Width** : 5/64~5/16 **T-MAX** : 1/8~13/64	**Width** : 3/64~11/64 **T-MAX** : 1/16~13/64	**Width** : 1/8~13/64 **T-MAX** : 13/16~2	**Width** : 3/64~11/64 **T-MAX** : 1/16~5/32	**Width** : 3/64~5/16 **T-MAX** : 5/64~23/64	**Width** : 1/8~5/16 **T-MAX** : 35/64	**Width** : 1/16~5/16 **T-MAX** : 11/16~1 7/16	**Width** : 1/16~5/16 **T-MAX** : 13/32~13/32
KRMN	MRMN	TB	POB	GO GS	GW BF	DC DB	KGMN KRMN KGGN KRGN	MGMN MRMN MRGN MGGN

For internal machining



NFTIH	GFIK	GFIP	IGH	KGIVR/L	MGIVR/L	KGIUR/L	MGIUR/L
Width : 1/32~5/32 **T-MAX** : 3/16~13/32	**Width** : 5/64~5/16 **T-MAX** : 5/64~5/16	**Width** : 3/64~5/16 **T-MAX** : 5/64~23/64	**Width** : 3/64~7/64 **T-MAX** : 1/16~3/32	**Width** : 1/16~3/16 **T-MAX** : 1/4~5/16	**Width** : 1/16~5/16 **T-MAX** : 5/32~13/32	**Width** : 1/8 **T-MAX** : 1/8	**Width** : 1/8~5/16 **T-MAX** : 9/64~1/4
NFTG NFTF NFTT	GR	GW BF	IG	KGMI KRMN	MGMN MRMN MRGN	KRMN	MRMN

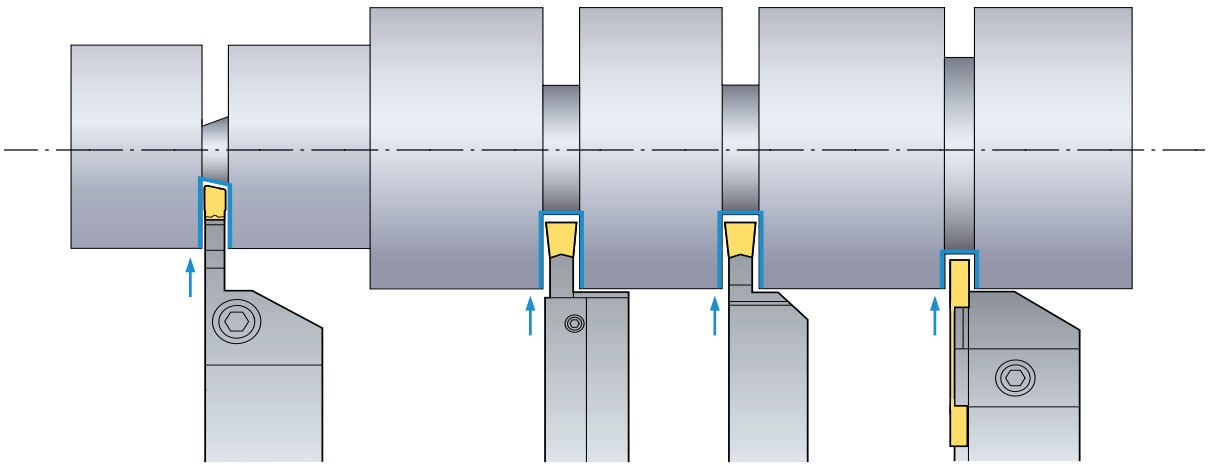
For face grooving



KGEVR/L	MGEVR/L
Width : 1/8~3/16 **T-MAX** : 3/16~5/16	**Width** : 1/16~5/16 **T-MAX** : 1/8~23/64
KGGN KGMN KRMN	MGGN MGMN MRMN

FGHH/FGVH	MGFHR/L, MGFVR/L	KGFHR/L, KGFVR/L
Width : 1/8~13/64 **T-MAX** : 15/32~1	**Width** : 1/8~5/32 **T-MAX** : 13/32~19/32	**Width** : 3/16 **T-MAX** : 13/16
FGD FGM FMM	MGMN MFMN MRMN	KGMN KRMN

For parting off



KGEHR/L	MGEHR/L	SPB-(S)	SPH-(S)	PH
Width : 1/8 **T-MAX** : 13/16	**Width** : 5/64~13/64 **T-MAX** : 13/32~13/32	**Width** : 5/64~15/64 **ØD-MAX** : 1 3/8~5	**Width** : 5/64~15/64 **ØD-MAX** : 1 1/4~2 3/4	**Width** : 1/8~13/64 **ØD-MAX** : 13/16~2
KGMR/L	MGMR/L	SP		POB

Face grooving tools

For Shallow Grooving

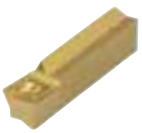
- Economical tools utilizing a double ended cutting edge system
- Newly designed chip breakers that help ensure chip control for various face grooving applications
- Korloy face grooving tools provide various holder line-ups to give you more options and benefits

MFMN300	MGMN400	Horizontal MGFHR	Vertical MGFVR
			
Cutting width 0.118inch	Cutting Width 0.158inch	Machining Dia.Ø0.945~7.874inch	Machining Dia. Ø0.945~2.362inch

KGMN300~600	Horizontal KGFHR	Vertical KGFVR
		
Cutting Width 0.118~0.236inch	Machining Dia. Ø1.339~8.661inch	Machining Dia. Ø1.732~7.874inch

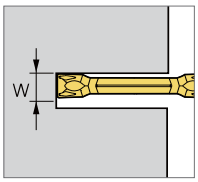
For Deep Grooving

- These tools are suitable for deep grooving with a single cutting edge(Tmax 0.984inch)
- A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- A variety of holders ensures multiple application ranges

FGD	FGM	FMM	Horizontal FGHH	Vertical FGVH
				
Deep face grooving (G class)	Wide face grooving turning (G class)	Wide face grooving turning (M class)	Machining Dia. Ø0.984~5.512inch	Machining Dia. Ø0.984~5.512inch

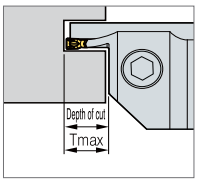
Selection System of Holder

▶ Follow these 3 simple directions to choose the right insert and holder for your application



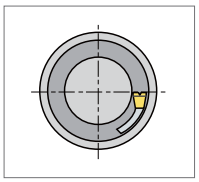
Insert and holder

Choose an insert and holder that best applies to your application according to the cutting width and part of workpiece to be machined.



Holder Tmax

Choose the holder with the shortest overhang that will still meet the cutting depth required



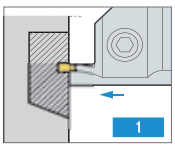
Machining Dia.

Choose the largest size of shank depending on the initial grooving diameter required in the application

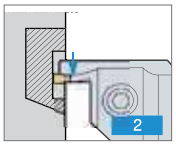
Notice : To minimize chattering, use the shortest holder according to Tmax.

Optimization of Face Grooving

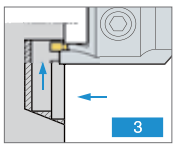
Roughing : When face grooving deareases the cutting speed 40% below a normal face turning operation



• Grooving at the initial diameter

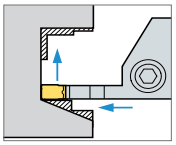


• Face turning away from center

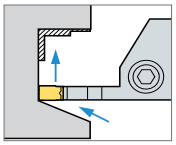


• Face turning to center

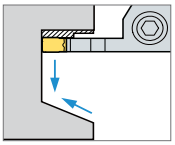
Finishing : When face grooving deareases the cutting speed 40% below a normal face turning operation



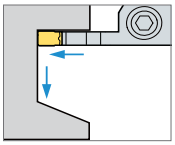
• Grooving at the initial diameter to the final cutting depth and face turning away from center



• Radius operation toward final dimension at the bottom



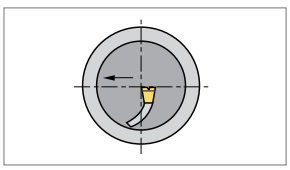
• Face turning to center



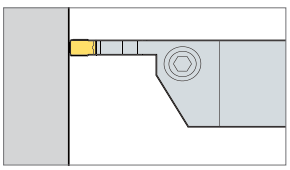
• Grooving for the right dimension you want

Notice for Face Grooving

▶ Before machining, check and adjust the following holder position



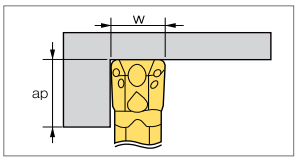
- Check the cutting edge height at the center of the workpiece
- Machine towards the center and check for burrs

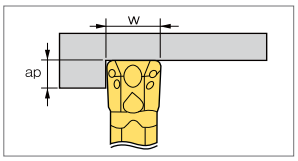


- For better surface roughness, set up the insert in order to perpendicular at center line

Turning and Grooving

Selection of Insert





▶ Feed rate
- Decide maximum feed rate after considering the insert's characteristics and machine capabilities. (Fmax = W x 0.075)
- Max feed rate should not be larger than the corner radius of the insert
- In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals

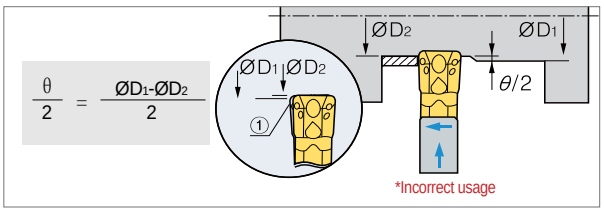
▶ Depth of cut
- The minimum depth of cut should be bigger than corner radius of insert
- When deciding on the max depth of cut please consider the machine's cutting load
- Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

Notice for turning

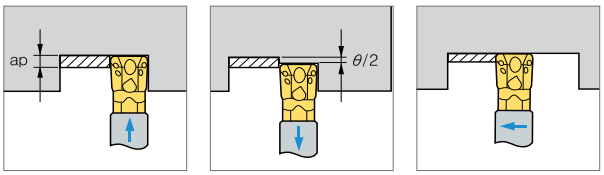
▶ KGT/MGT tools are designed to incur side cutting force from its clearance angle; this feature gives you advantage over a standard ISO insert.
▶ The standard MGT insert also provides a "wiper" effect to improve surface roughness

Notice for Finishing (offset need final quality)

▶ After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want

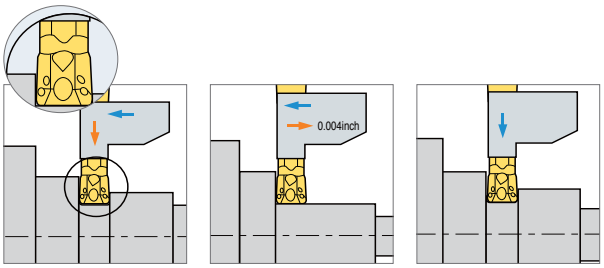


▶ To eliminate the difference in the machined diameter by utilizing the clearance angle (which is commonly generated during the final turning operation) follow the directions above when machining
To obtain a good surface roughness without offsetting in an application follows the directions below
1) Groove to the desired diameter
2) Pull the tool backs a total distance of θ/2
3) Continue the external turning operation to desired diameter

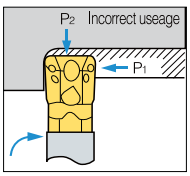


Notice for MGT turning applications

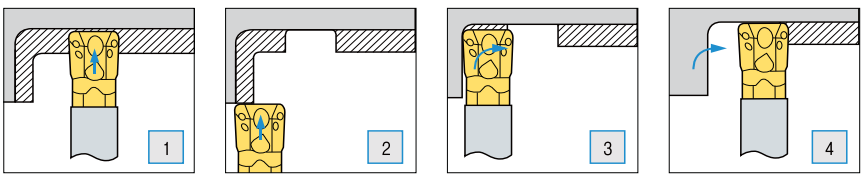
▶ KGT/MGT tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. This might create normal wear on the insert, after turning, a grooving process might not meet the desired diameter on the work piece. To off set this, adjust the tool 0.004 inches and return to the original position of the grooving application



Machining workpiece with a radius bigger than the insert's corner radius

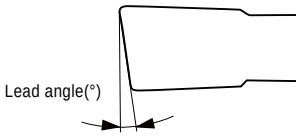
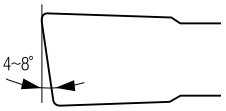
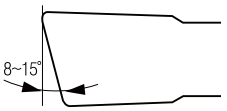


Stabilize your tool pressure. KGT/MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder



Parting off & Grooving

Insert

Lead angle applications	Lead angle 0°(Neutral)	Lead angle 4° ~ 8°	Lead angle 8°~15°
			
• 4°- Pipe (Tubing and hollow bar) • 6°- Pipe and solid bar • 8°- Solid bar • 15°- Small diameter Solid bar	• Parting off on solid bar type • Occurring the center stub when parting off • Prevent to be deflected workpiece by cutting diretion during parting off • Availble for use deep parting depth	• Reduce the center stub when parting off on solid bar type • Reduce the burr when parting off on tubing or hollow bar type	• Parting off on small diameter and hollow bar type • Reduce the burr and center stub when parting off on small diameter solid bar type

※ Available Inserts : MGMR/L - ☐☐ - PS/PT, KGMR/L - ☐☐ - LP/RP
(Lead angle) (Lead angle)

Selection of Insert

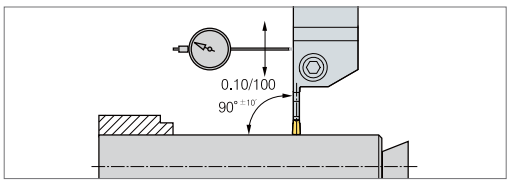
▶ To properly match the insert and cutting condition, the following factors should be considered
- Width of insert • Chip breaker • Grade and nose R

▶ The relationship between the cutting width and cutting depth
- Neutral type, inserts with a 0 degree lead angle are best when used an applications maximum depth of cut
- In general alloy steel, the maximum depth of cut = W x 0.8

▶ Insert with lead angle
- To reduce burrs, we recommend using insert with a lead angle.
  Insert that have larger lead angles reduce burrs but will also deareases tool life.
  In the case where burrs are acceptable, we recommend using a neutral type insert

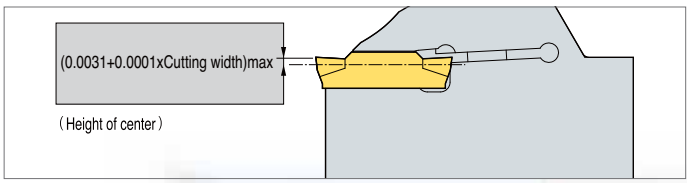
Setting of Holders

▶ The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of Parting off

▶ The edge height of an insert should be set within ±0.039inch based on the center line
- Parting off should be done as close to the chuck as possible to minimize vibration



Notice

▶ Keep a consistent cutting speed and feed
- Use proper amounts of coolant for better performance
- Properly clean the insert pocket before mounting insert

Usage

▶ If insert is worn, immediately replace with a new insert.
This is to prevent the damage on the workpiece
- If the holder seat is worn or damaged replace with a new one immediately for stable clamping
- Do not grind or regrind the holder seat

Selection of Chip Breaker

Our chip breakers are designed to narrow chips during grooving operations.
Narrow chips usually offer the following advantages
▶ Deareases friction between chips and the workpiece.
This usually gives a better surface roughness finish
▶ With better chip flow, a machinist is able to increase feed rates due to a reduced cutting load

Multi-functional machining with strong clamping system and new technology

KGT Series

- Double-sided inserts of KGT series reduces machining cost.
- Strong clamping system ensures stable and accurate machining.
- New grade and new technology provide superior tool life.
- Various tooling solutions of the KGT series improve productivity.
- The foreside and clearance face of the KGT insert having cutting edges are optimal for grooving, parting-off, turning and facing with reducing processing time.
- Three-dimensional chip breaker ensures excellent chip control in various applications.
- The KGT inserts with various chip breakers are available for wide application range.
- Special cutting edges are available for quotation.

Insert Code System

KG	M	N	300	-	04	-	T
KG SYSTEM (KORLOY Grooving)	Tolerance	Hand	Width of cutting edge		Nose radius		Chip breaker
	M class G class	N : Neutral R : Right L : Left I : Internal	0.079~0.315 inch		1/128 inch 3/256 inch 1/64 inch 1/32 inch		L / R / T / C / LP / RP / B / A

Holder Code System

KG	E	H	R/L	16	-	3	-	T15
KG SYSTEM (KORLOY Grooving)	Working Style	Holder Style	Hand	Shank standard		Cutting width		Maximum depth
	E : External Process I : Internal Process	H : Horizontal V : Vertical U : Undercut	R : Right L : Left	Height 1inch Width 1inch (For Internal machining : Minimum diameter for machining), Shank diameter		0.079~0.315 inch		0.315~1.417 inch

KGT line up

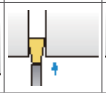
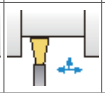
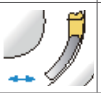
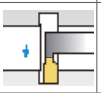
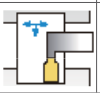
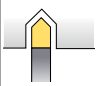
Application

	Parting	Grooving	Turning	Copying	Special	Aluminium
medium and large, interrupted cutting	Rough Parting	Rough Grooving	Turning-Multi Grooving	Copying	Blank	Aluminium Grooving (KGGN)
small, continuous cutting	Light Parting	Light Grooving	T(KGMI) Internal Grooving			Aluminium Grooving (KRGN)

▶ Lead angle applied to LP & RP chip breakers - only for parting off

▶ B chip breaker can be customized (contact required in advance)

Recommended Insert

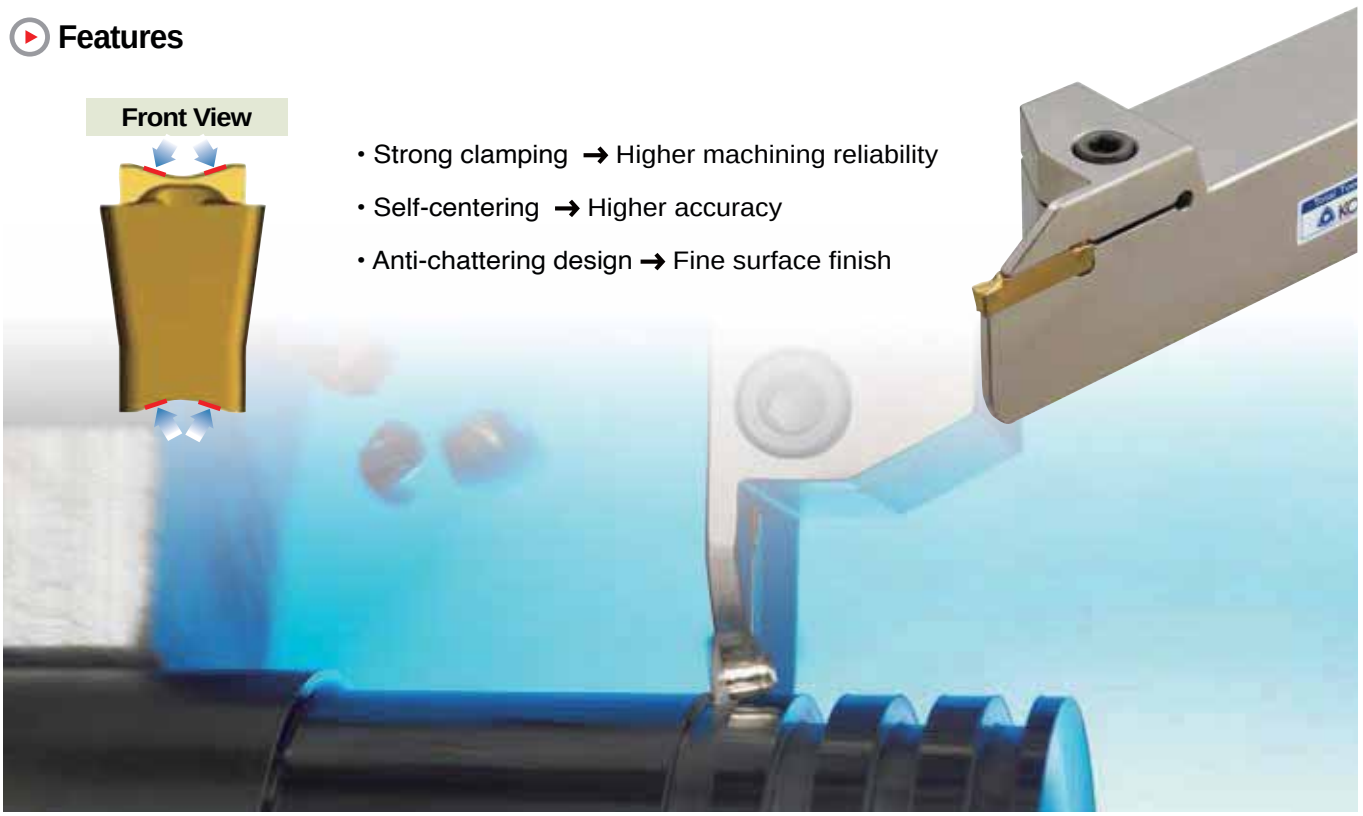
Designation	Geometry	Picture	Application									
			For external machining			For face grooving		For Internal machining		Copying	For reliefing	Special machining
			Parting	Grooving	Turning	Grooving	Turning	Grooving	Turning	Copying	Reliefing	Special
												
KGMN	L Light Grooving		○	◎		○						
	R Rough Grooving		○	◎		○						
	T Turning-Multi Grooving		○	◎	◎	◎	◎					
KGMI	T Internal Grooving							◎	◎			
KRMN	C Copying									◎	◎	
KGMR/L	LP Light Parting		◎									
	RP Rough Parting		◎									
KGGN	B Blank			○								◎
	A Aluminum Grooving		○	◎	○							
KRGN	A Aluminum Profiling									◎	◎	

◎ First choice, ○ Second choice

Features

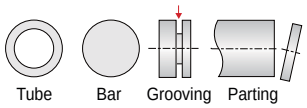
Front View

- Strong clamping ➜ Higher machining reliability
- Self-centering ➜ Higher accuracy
- Anti-chattering design ➜ Fine surface finish



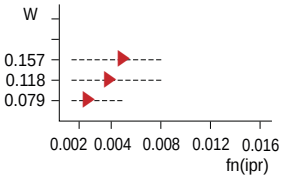
C/B guide

L For Light Grooving

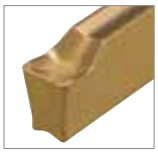


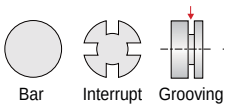
- Sharp cutting edge
- Low feed machining
- Small diameter component

- Low carbon steel
- Carbon steel
- Alloy steel
- Stainless



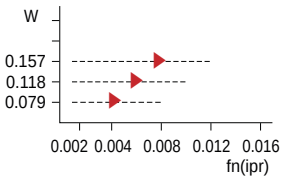
R For Rough Grooving



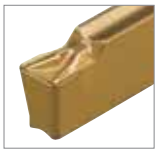


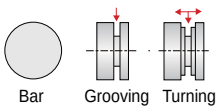
- Strong cutting edge
- High feed machining
- Interrupted cutting

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



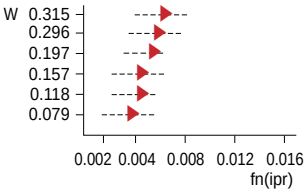
T For Turning and Multi Grooving



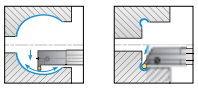


- Sharp cutting edge
- Improved chip control
- Turning & grooving machining

- Carbon steel
- Alloy steel
- Stainless
- Cast iron

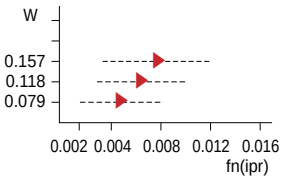


C For Copying and Relief

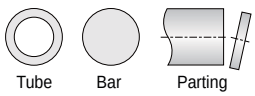


- Improved chip control
- Copying
- Relief

- Carbon steel
- Alloy steel
- Stainless
- Cast iron

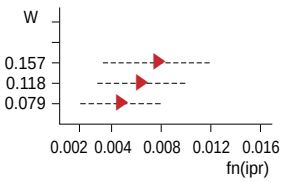


LP For Light Parting

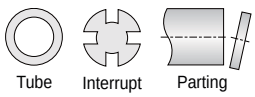


- Sharp cutting edge
- Low feed machining
- Small diameter component
- Right / Left handed

- Low carbon steel
- Carbon steel
- Alloy steel
- Stainless

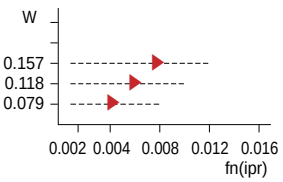


RP For Rought Parting

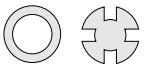


- Strong cutting edge
- High feed machining
- Interrupted cutting
- Right / Left handed

- Carbon steel
- Alloy steel
- Cast iron

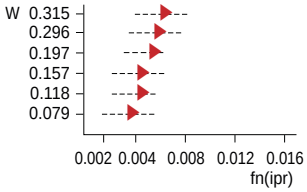


B For Precision Grooving

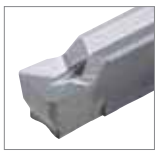


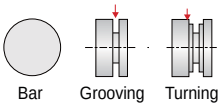
- Ground insert
- Precise tolerance
- Various cutting edge length, Nose R
- Improved chip control

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



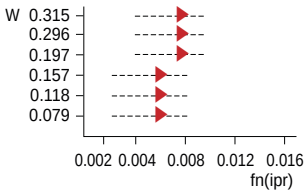
A For Aluminium Grooving





- Sharp cutting edge
- Precise tolerance

- Aluminium alloy
- Copper alloy



Grades for recommended application range

Workpiece		Grade	Order of recommended grade	Recommended cutting speed(sfm) 160 – 320 – 480 – 640 – 2560
P	Steel	PC5300	1	230 – 395
		NC3220 NC3225	2	430 – 725
		NC5330	3	395 – 660
	Alloy steel	PC5300	1	200 – 345
		NC3220 NC3225	2	430 – 725
		NC5330	3	295 – 590
M	Stainless steel	PC5300	1	230 – 395
		PC9030	2	230 – 380
		NC5330	3	250 – 410
K	Cast iron	PC5300	1	180 – 295
		NC5330	2	315 – 525
N	Non ferrous metal	H01	1	650 – 2600
S	HRSA	PC5300	1	65 – 115

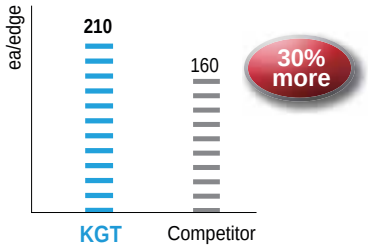
Cutting Performance

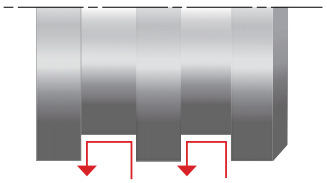
Multi-function machining

Turning + Grooving repetition

Optimized geometry for turning + grooving - High efficiency.

- **Workpiece** AISI1045
- **Cutting condition** vc = 560(sfm)
  fn = 0.006(ipr)
  ap = 0.079inch
  W = 0.118inch
  wet
- **Designation** KGMN300-04-T(PC5300)



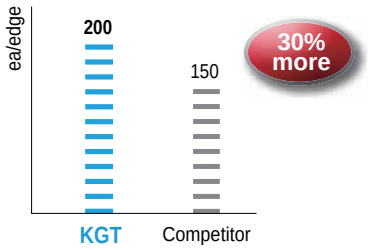


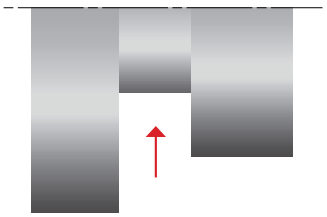
Grooving

Shoulder Grooving

Tough geometry for interrupted and deep grooving.

- **Workpiece** AISI304
- **Cutting condition** vc = 390(sfm)
  fn = 0.005(ipr)
  ap = 0.197inch
  W = 0.157inch
  wet
- **Designation** KGMN400-03-R(PC5300)



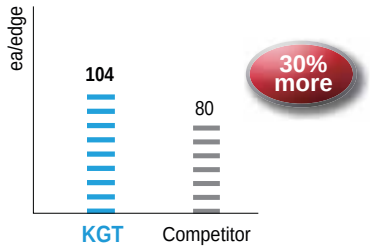


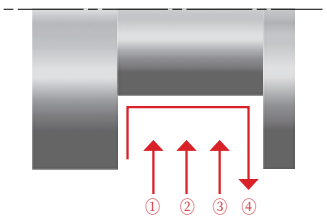
Shaft machining

Grooving(Roughing) & Turning(Finishing)

Excellent chip control for higher efficiency.

- **Workpiece** AISI4140
- **Cutting condition** vc = 490(sfm)
  fn = 0.006(ipr)
  ap = 0.197inch
  W = 0.118inch x 3
  wet
- **Designation** KGMN300-04-T(PC5300)



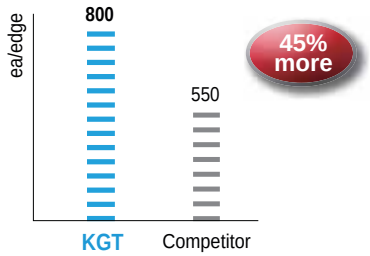


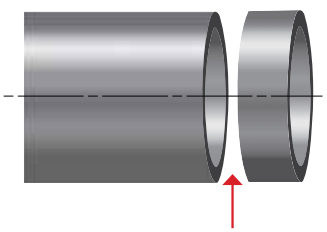
Parting off

Pipe Parting-off

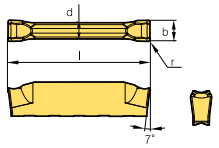
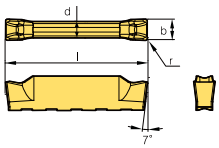
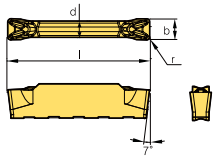
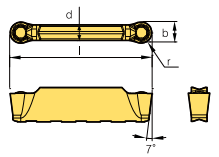
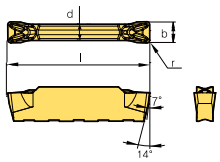
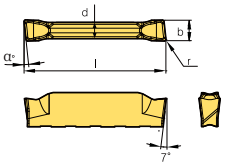
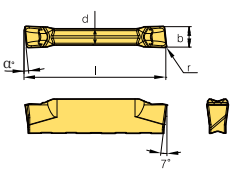
Exclusive parting-off chip breaker for longer tool life. / Sharp geometry for less burr.

- **Workpiece** AISI304
- **Cutting condition** vc = 460(sfm)
  fn = 0.006(ipr)
  ap = 0.079inch
  W = 0.118inch
  wet
- **Designation** KGMR300-6D-LP(PC5300)





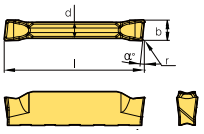
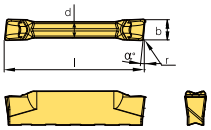
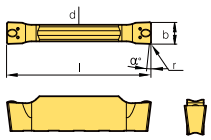
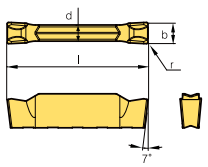
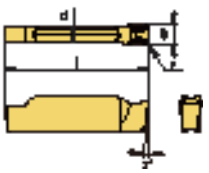
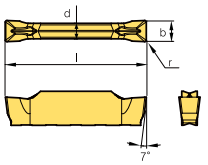
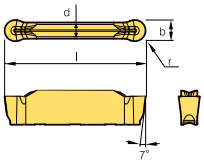
Insert

Application	Picture	Designation		Coated						Dimensions (inch)					Picture	Page
				NC3220	NC3225	NC5330	PC5300	PC9030	H01	b	r	l	d	α°		
Grooving		KGMN	200-02-L	●	●	●	●	●		0.079	1/128	0.787	0.067	-		C14~19 C21
			300-02-L	●	●	●	●	●		0.118	1/128	0.787	0.091	-		
			400-02-L	●	●	●	●	●		0.157	1/128	0.787	0.130	-		
			500-03-L		●	●	●			0.197	3/256	0.984	0.161	-		
			600-03-L		●	●	●			0.236	3/256	0.984	0.200	-		
Grooving · Parting off		KGMN	150-015-R		●	●	●			0.059	3/512	0.630	0.047	-		C14~19 C21
			200-02-R	●	●	●	●	●		0.079	1/128	0.787	0.067	-		
			300-02-R	●	●	●	●	●		0.118	1/128	0.787	0.091	-		
			400-03-R	●	●	●	●	●		0.157	3/256	0.787	0.130	-		
			500-03-R			●	●			0.197	3/256	0.984	0.161	-		
			600-03-R			●	●			0.236	3/256	0.984	0.200	-		
			800-04-R			●	●			0.315	1/64	1.181	0.240	-		
Grooving · Turning		KGMN	150-015-T		●	●	●			0.059	3/512	0.630	0.047			C14~19 C21
			200-02-T	●	●	●	●	●		0.079	1/128	0.787	0.067	-		
			250-02-T		●	●	●			0.098	1/128	0.787	0.079			
			300-02-T	●	●	●	●	●		0.118	1/128	0.787	0.091	-		
			300-04-T	●	●	●	●	●		0.118	1/64	0.787	0.091	-		
			400-04-T	●	●	●	●	●		0.157	1/64	0.787	0.130	-		
			400-08-T	●	●	●	●	●		0.157	1/32	0.787	0.130	-		
			500-04-T	●	●	●	●	●		0.197	1/64	0.984	0.161	-		
			500-08-T	●	●	●	●	●		0.197	1/32	0.984	0.161	-		
			600-04-T	●	●	●	●	●		0.236	1/64	0.984	0.200	-		
			600-08-T	●	●	●	●			0.236	1/32	0.984	0.200	-		
			800-08-T	●	●		●			0.315	1/32	1.181	0.240	-		
Grooving · Turning		KRMN	200-C		●	●	●			0.079	3/64	0.787	0.067	-		C14~20
			300-C		●	●	●			0.118	1/14	0.787	0.087	-		
			400-C		●	●	●			0.157	5/64	0.787	0.126	-		
			500-C		●	●	●			0.197	3/32	0.984	0.157	-		
			600-C		●	●	●			0.236	1/8	0.984	0.197	-		
			800-C		●	●	●			0.315	5/32	1.181	0.236	-		
Grooving · Internal		KGMI	200-02-T				●			0.079	1/128	0.787	0.067	-		C21
			300-04-T				●			0.118	1/64	0.787	0.091	-		
			400-04-T				●			0.157	1/64	0.787	0.130	-		
Parting off (Right handed)		KGMR	200-6D-LP			●	●			0.079	1/128	0.787	0.067	6		C14 C16
			200-8D-LP							0.079	1/128	0.787	0.067	8		
			200-15D-LP			●	●			0.079	1/128	0.787	0.067	15		
			300-6D-LP			●	●			0.118	1/128	0.787	0.091	6		
			300-15D-LP			●	●			0.118	1/128	0.787	0.091	15		
			400-4D-LP			●	●			0.157	3/256	0.787	0.130	4		
			400-15D-LP			●	●			0.157	3/256	0.787	0.130	15		
			500-4D-LP							0.197	3/256	0.984	0.161	4		
Parting off (Right handed)		KGMR	200-6D-RP			●	●			0.079	1/128	0.787	0.067	6		C14 C16
			200-8D-RP							0.079	1/128	0.787	0.067	8		
			200-15D-RP			●	●			0.079	1/128	0.787	0.067	15		
			300-6D-RP			●	●			0.118	1/128	0.787	0.091	6		
			300-15D-RP			●	●			0.118	1/128	0.787	0.091	15		
			400-4D-RP			●	●			0.157	3/256	0.787	0.130	4		
			400-15D-RP			●	●			0.157	3/256	0.787	0.130	15		
			500-4D-RP							0.197	3/256	0.984	0.161	4		

• Chip breaker 'B' : User self-grind type.

● : Stock item

Insert

Application	Picture	Designation		Coated						Dimensions (inch)					Picture	Page
				NC3220	NC3225	NC5330	PC5300	PC9030	H01	b	r	l	d	α°		
Parting off (Left handed)		KGML	200-6D-LP							0.079	1/128	0.787	0.067	6		C14 C16
			200-15D-LP							0.079	1/128	0.787	0.067	15		
			300-6D-LP							0.118	1/128	0.787	0.091	5		
			300-15D-LP							0.118	1/128	0.787	0.091	16		
			400-4D-LP							0.157	1/128	0.787	0.130	4		
			400-15D-LP							0.157	1/128	0.787	0.130	15		
Parting off (Left handed)		KGML	200-6D-RP							0.079	1/128	0.787	0.067	6		C14 C16
			200-15D-RP							0.079	1/128	0.787	0.067	15		
			300-6D-RP							0.118	1/128	0.787	0.091	6		
			300-15D-RP							0.118	1/128	0.787	0.091	15		
			400-4D-RP							0.157	1/128	0.787	0.130	4		
			400-15D-RP							0.157	1/128	0.787	0.130	15		
Grooving(Ground insert)		KGGN	265-015-B							0.104	3/512	0.787	0.091	-	 KGGN-B	C14 C16 C17
			300-020-B							0.118	1/128	0.787	0.091	-		
			300-040-B							0.118	1/64	0.787	0.091	-		
			315-015-B							0.124	3/512	0.787	0.091	-		
			400-040-B							0.157	1/64	0.787	0.130	-		
			400-080-B							0.157	1/32	0.787	0.130	-		
			415-015-B							0.163	3/512	0.787	0.130	-		
			478-055-B							0.188	11/512	0.787	0.130	-		
			500-080-B							0.197	1/32	0.984	0.161	-		
			515-015-B							0.203	3/512	0.984	0.161	-		
			600-080-B							0.236	1/32	0.984	0.200	-		
			600-120-B							0.236	3/64	0.984	0.200	-		
			800-080-B							0.315	1/32	1.181	0.240	-		
			800-120-B							0.315	3/64	1.181	0.240	-		
Grooving · Parting off	 (Ground insert)	KGGN	200-02-R							0.079	1/128	0.787	0.067	-		C14~19
			300-02-R							0.118	1/128	0.787	0.091	-		
			400-03-R							0.157	3/256	0.787	0.130	-		
			500-03-R							0.197	3/256	0.984	0.161	-		
			600-03-R							0.236	3/256	0.984	0.200	-		
			800-04-R							0.315	1/64	1.181	0.240	-		
Grooving · Parting off	 (Single insert)	KGGN	200S-02-R							0.079	1/128	0.76	0.067	-		
			300S-02-R							0.118	1/128	0.785	0.091	-		
			400S-03-R							0.157	3/256	0.785	0.130	-		
			500S-03-R							0.197	3/256	0.982	0.161	-		
			600S-03-R							0.236	3/256	0.982	0.200	-		
			800S-04-R							0.315	1/64	1.178	0.240	-		
Aluminum Grooving		KGGN	200-02-A						●	0.079	1/128	0.787	0.067	-		C14~19
			300-02-A						●	0.118	1/128	0.787	0.091	-		
			400-04-A						●	0.157	1/64	0.787	0.130	-		
			500-04-A						●	0.197	1/64	0.984	0.161	-		
			600-04-A						●	0.236	1/64	0.984	0.200	-		
Aluminum Profiling		KRGN	300-A						●	0.118	1/16	0.787	0.091	-		C14~18
			400-A						●	0.157	5/64	0.787	0.130	-		
			500-A						●	0.197	3/32	0.984	0.161	-		
			600-A						●	0.236	1/8	0.984	0.200	-		
			800-A						●	0.315	5/32	1.181	0.240	-		

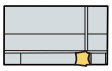
• Chip breaker 'B' : User self-grind type.

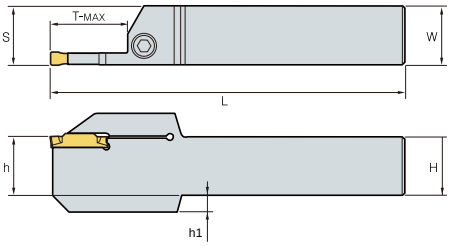
● : Stock item

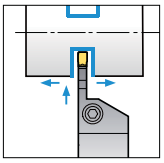
KGEHR/L

For Grooving, Turning, Parting off, Reliefing machining

KGGN KGMN
KGMR/L KRMN
KRGN







R type insert
(inch)

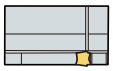
Designation		H=(h)	W	L	S	h1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	10-1.5-T14	5/8	5/8	4	0.638	-	0.551	KGMN150-□-□	MHA0512	HW40L
	12-1.5-T14	3/4	3/4	5	0.795	-	0.551			
	16-1.5-T14	1	1	6	0.795	-	0.551			
	08-2-T08	1/2	1/2	4	0.480	-	0.315	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	MHA0512	HW40L
	10-2-T08	5/8	5/8	4	0.633	-	0.315			
	12-2-T08	3/4	3/4	5	0.758	-	0.315			
	16-2-T08	1	1	6	1.008	-	0.315			
	10-2-T12	5/8	5/8	4	0.633	-	0.472			
	12-2-T12	3/4	3/4	5	0.758	-	0.472			
	16-2-T12	1	1	6	1.008	-	0.472			
	10-2-T17	5/8	5/8	4	0.633	-	0.669			
	12-2-T17	3/4	3/4	5	0.758	-	0.669			
	16-2-T17	1	1	6	1.008	-	0.669			
	10-2.5-T17	5/8	5/8	4	0.642	-	0.669	KGMN250-□-□	MHA0512	HW40L
	12-2.5-T17	3/4	3/4	5	0.642	-	0.669			
	16-2.5-T17	1	1	6	0.642	-	0.669			
	10-3-T10	5/8	5/8	4	0.641	-	0.394	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	12-3-T10	3/4	3/4	5	0.766	-	0.394			
	16-3-T10	1	1	6	1.016	-	0.394			
	20-3-T10	1 1/4	1 1/4	6 3/4	1.276	-	0.394			
	10-3-T13	5/8	5/8	4	0.641	-	0.512			
	12-3-T13	3/4	3/4	5	0.766	-	0.512			
	16-3-T13	1	1	6	1.016	-	0.512			
	10-3-T20	5/8	5/8	4	0.641	-	0.787			
	12-3-T20	3/4	3/4	5	0.766	-	0.787			
	16-3-T20	1	1	6	1.016	-	0.787			
	20-3-T20	1 1/4	1 1/4	6 3/4	1.266	-	0.787			
	16-3-T25	1	1	6	1.016	-	0.984			
	10-4-T10	5/8	5/8	4	0.641	-	0.394	KGMN400-□-□ KGMR/L400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	12-4-T10	3/4	3/4	5	0.766	-	0.394			
	16-4-T10	1	1	6	1.016	-	0.394			
	20-4-T10	1 1/4	1 1/4	6 3/4	1.276	-	0.394			
	10-4-T15	5/8	5/8	4	0.641	-	0.591			
	12-4-T15	3/4	3/4	5	0.766	-	0.591			
	16-4-T15	1	1	6	1.016	-	0.591			
	10-4-T20	5/8	5/8	4	0.641	-	0.787			
	12-4-T20	3/4	3/4	5	0.766	-	0.787			
	16-4-T20	1	1	6	1.016	-	0.787			
	20-4-T20	1 1/4	1 1/4	6 3/4	1.266	-	0.787			
	10-4-T25	5/8	5/8	4	0.641	-	0.984			
	12-4-T25	3/4	3/4	5	0.766	-	0.984			
	16-4-T25	1	1	6	1.016	-	0.984			

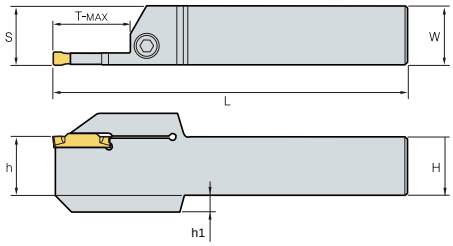
Applicable inserts **C12~C13**

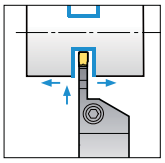
KGEHR/L

For Grooving, Turning, Parting off, Reliefing machining

KGGN KGMN
KGMR/L KRMN
KRGN







R type insert

(inch)

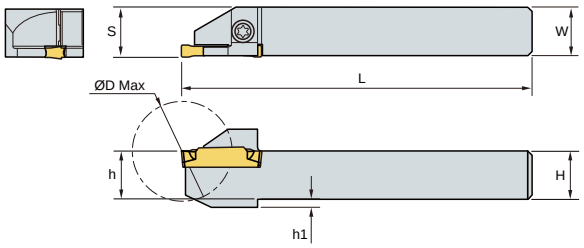
Designation		H=(h)	W	L	S	h1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	12-5-T12	3/4	3/4	5	0.770	-	0.472	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-5-T12	1	1	6	1.020	-	0.472			
	12-5-T15	3/4	3/4	5	0.807	-	0.591			
	16-5-T15	1	1	6	1.004	-	0.591			
	20-5-T15	1 1/4	1 1/4	6 3/4	1.280	-	0.591			
	12-5-T20	3/4	3/4	5	0.770	-	0.787			
	16-5-T20	1	1	6	1.020	-	0.787			
	20-5-T20	1 1/4	1 1/4	6 3/4	1.270	-	0.787		BHA0620	HW50L
	16-5-T32	1	1	6	1.020	0.276	1.260			
	12-6-T12	3/4	3/4	5	0.770	-	0.472	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-T12	1	1	6	1.020	-	0.472			
	16-6-T15	1	1	6	1.004	-	0.591			
	20-6-T15	1 1/4	1 1/4	6 3/4	1.280	-	0.591			
	12-6-T20	3/4	3/4	5	0.770	-	0.787			
	16-6-T20	1	1	6	1.020	-	0.787			
	20-6-T20	1 1/4	1 1/4	6 3/4	1.270	-	0.787		BHA0620	HW50L
	16-6-T32	1	1	6	1.020	0.276	1.260			
	16-8-T16	1	1	6	1.020	-	0.630	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	20-8-T16	1 1/4	1 1/4	6 3/4	1.299	-	0.630			
	16-8-T25	1	1	6	1.039	-	0.984			
	20-8-T25	1 1/4	1 1/4	6 3/4	1.289	-	0.984		BHA0620	HW50L
	16-8-T36	1	1	6	1.039	0.276	1.417			
	20-8-T36	1 1/4	1 1/4	6 3/4	1.289	-	1.417			

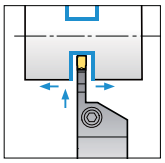
Applicable inserts **C12~C13**

KGEHR/L-D00A (AUTO-TOOL)

For Grooving, Turning, Parting off machining

KGGN KGMN
KGMR/L KRMN
KRGN





R type insert

(inch)

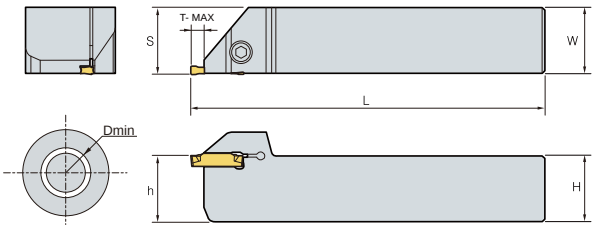
Designation		H=(h)	W	L	S	h1	ØD Max	Inserts	Screw	Wrench
KGEHR/L	06-2-D20A	3/8	3/8	5	0.383	0.079	0.787	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	08-2-D25A	1/2	1/2	5	0.508	0.079	0.984			
	10-2-D32A	5/8	5/8	5	0.633	-	1.260			
	08-3-D25A	1/2	1/2	5	0.508	0.079	0.984	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□		
	10-3-D32A	5/8	5/8	5	0.633	-	1.260			

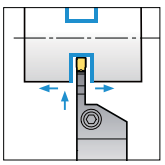
Applicable inserts **C12~C13**

KGEHR/L-T00

For Grooving, Turning, Face grooving machining

KGMN KRMN
KGGN KRGN





R type insert

(inch)

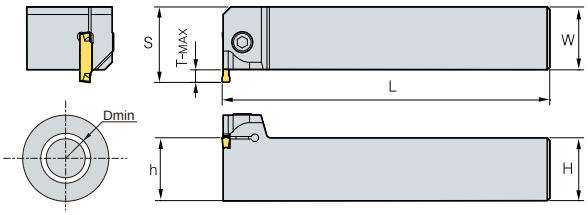
Designation		H=(h)	W	L	S	D min	T-MAX	Inserts	Screw	Wrench
KGEHR/L	10-3-T00	5/8	5/8	4	0.646	3.150	0.189	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	12-3-T00	3/4	3/4	5	0.803	3.150	0.189			
	16-3-T00	1	1	6	1.016	3.150	0.189			
	10-4-T00	5/8	5/8	4	0.641	3.150	0.189	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	12-4-T00	3/4	3/4	5	0.766	3.150	0.189			
	16-4-T00	1	1	6	1.016	3.150	0.189			
	12-6-T00	3/4	3/4	5	0.770	3.150	0.236	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-T00	1	1	6	1.020	3.150	0.236			

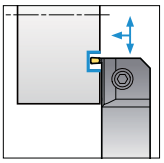
Applicable inserts **C12~C13**

KGEVR/L-T00

For Grooving, Turning, Face grooving machining

KGMN KRMN
KGGN KRGN





R type insert

(inch)

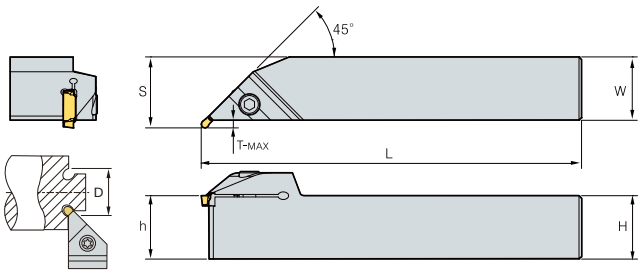
Designation		H=(h)	W	L	S	D min	T-MAX	Inserts	Screw	Wrench
KGEVR/L	12-1.5-T00	3/4	3/4	5	0.925	4.724	0.118	KGMN200-□-□ KRMN200-C KGGN200-□-□-□	MHA0512	HW40L
	16-1.5-T00	1	1	6	1.122	4.724	0.118			
	20-1.5-T00	1 1/4	1 1/4	6 3/4	1.398	4.724	0.118			
	12-2-T00	3/4	3/4	5	0.925	4.724	0.118			
	16-2-T00	1	1	6	1.122	4.724	0.118			
	20-2-T00	1 1/4	1 1/4	6 3/4	1.398	4.724	0.118			
	12-2.5-T00	3/4	3/4	5	0.965	3.150	0.157	KGMN250-□□	MHA0512	HW40L
	16-2.5-T00	1	1	6	1.161	3.150	0.157			
	20-2.5-T00	1 1/4	1 1/4	6 3/4	1.437	3.150	0.157			
	12-3-T00	3/4	3/4	5	0.947	3.150	0.189	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	16-3-T00	1	1	6	1.197	3.150	0.189			
	20-3-T00	1 1/4	1 1/4	6 3/4	1.457	3.150	0.189			
	12-4-T00	3/4	3/4	5	0.947	3.150	0.189	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	16-4-T00	1	1	6	1.197	3.150	0.189			
	20-4-T00	1 1/4	1 1/4	6 3/4	1.457	3.150	0.189			
	12-5-T00	3/4	3/4	5	1.161	2.362	0.236	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-5-T00	1	1	6	1.240	2.362	0.236			
	20-5-T00	1 1/4	1 1/4	6 3/4	1.516	2.362	0.236			
	12-6-T00	3/4	3/4	5	1.043	2.362	0.236			
	16-6-T00	1	1	6	1.256	3.150	0.236			
	20-6-T00	1 1/4	1 1/4	6 3/4	1.516	2.362	0.236			
	16-8-T00	1	1	6	1.319	1.969	0.315	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	20-8-T00	1 1/4	1 1/4	6 3/4	1.516	1.969	0.315			

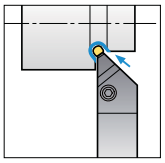
Applicable inserts **C12~C13**

KGEUR/L

For Reliefing machining

KRMN
KRGN





R type insert

(inch)

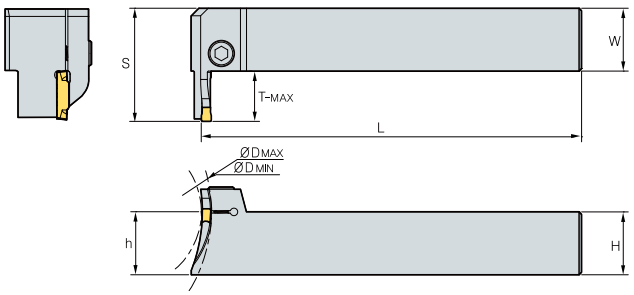
Designation		H=(h)	W	L	S	ØD Max	T-MAX	Inserts	Screw	Wrench
KGEUR/L	10-3	5/8	5/8	4	0.748	1.575	0.110	KRMN300-C KRGN300-□	MHA0512	HW40L
	12-3	3/4	3/4	5	0.906	1.575	0.110			
	16-3	1	1	6	1.102	1.575	0.110			
	20-3	1 1/4	1 1/4	6 3/4	1.378	1.575	0.110			
	10-4	5/8	5/8	4	0.748	1.575	0.110	KRMN400-C KRGN400-□	BHA0616	HW50L
	12-4	3/4	3/4	5	0.906	1.575	0.110			
	16-4	1	1	6	1.102	1.575	0.110			
	20-4	1 1/4	1 1/4	6 3/4	1.378	1.575	0.110			
	12-5	3/4	3/4	5	0.925	1.969	0.130	KRMN500-C KRGN500-□	BHA0616	HW50L
	16-5	1	1	6	1.122	1.969	0.130			
	20-5	1 1/4	1 1/4	6 3/4	1.398	1.969	0.130			
	12-6	3/4	3/4	5	0.925	1.969	0.130	KRMN600-C KRGN600-□	BHA0616	HW50L
	16-6	1	1	6	1.122	1.969	0.130			
	20-6	1 1/4	1 1/4	6 3/4	1.398	1.969	0.130			
	16-8	1	1	6	1.122	2.559	0.130	KRMN800-C KRGN800-□	BHA0616	HW50L
	20-8	1 1/4	1 1/4	6 3/4	1.398	2.559	0.130			

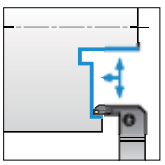
Applicable inserts **C12~C13**

KGFVR/L

For Face grooving machining

KGMN KRMN
KGGN KRGN





R type insert

(inch)

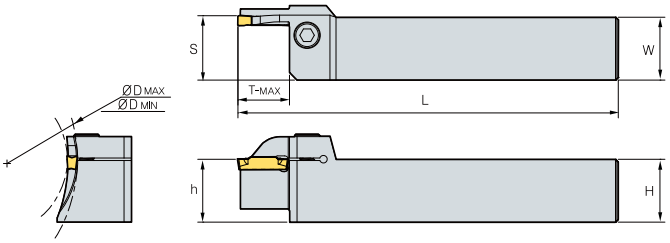
Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFVR/L	16-4-17/27-T20	1	1	6	1.807	0.787	1.732	2.756	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	16-4-23/47-T20	1	1	6	1.807	0.787	2.362	4.724			
	16-4-44/78-T20	1	1	6	1.807	0.787	4.409	7.874			

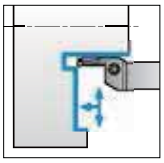
Applicable inserts **C12~C13**

KGFHR/L

For Face grooving machining

KGMN KRMN
KGGN KRGN





R type insert

(inch)

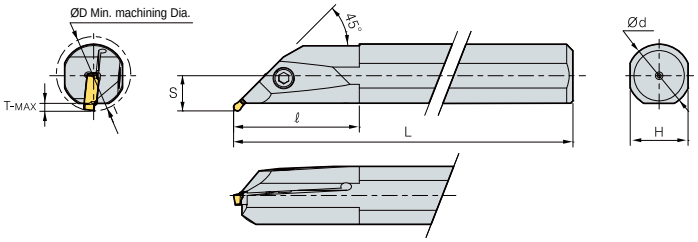
Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFHR/L	16-3-13/19-T10	1	1	6	1.004	0.394	1.339	1.969	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	16-3-17/27 T15	1	1	6	1.004	0.591	1.732	2.756			
	16-3-25/39-T15	1	1	6	1.004	0.591	2.520	3.937			
	16-4-15/23-T10	1	1	6	1.008	0.394	1.575	2.362	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	16-4-17/27-T20	1	1	6	1.016	0.787	1.732	2.756			
	16-4-23/47-T20	1	1	6	1.016	0.787	2.362	4.724			
	16-4-33/36-T20	1	1	6	1.008	0.787	3.307	3.622			
	16-4-44/78-T20	1	1	6	1.016	0.787	4.409	7.874			
	16-5-74/86-T10	1	1	6	1.008	0.394	7.480	8.661	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-6-66/74-T10	1	1	6	1.008	0.394	6.693	7.480	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-74/86-T10	1	1	6	1.008	0.394	7.480	8.661			

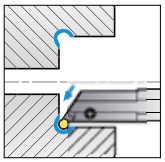
Applicable inserts **C12~C13**

KGIUR/L

For Reliefing machining

KRMN
KRGN





R type insert

(inch)

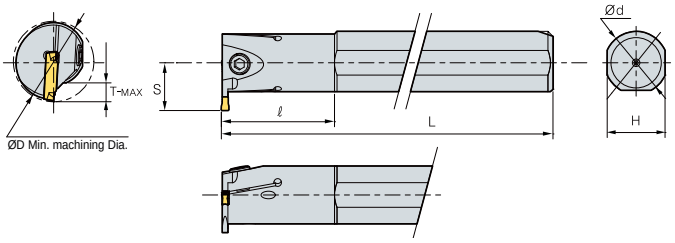
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIUR/L	13-12-3	1.378	3/4	6	1.772	0.138	0.709	0.512	KRMN300-C KRGN300-□	MHA0512	HW40L
	13-12-4	1.378	3/4	6	1.772	0.138	0.709	0.512			
	15-16-3	1.575	1	8	1.969	0.138	0.906	0.610			
	19-20-3	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-4	1.575	1	8	1.969	0.138	0.906	0.610	KRMN400-C KRGN400-□	MHA0512	HW40L
	19-20-4	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-5	1.575	1	8	1.969	0.138	0.906	0.610	KRMN500-C KRGN500-□	MHA0512	HW40L
	19-20-5	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-6	1.575	1	8	1.969	0.138	0.906	0.610	KRMN600-C KRGN600-□	MHA0512	HW40L
	19-20-6	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-8	1.575	1	8	1.969	0.138	0.906	0.610	KRMN800-C KRGN800-□	MHA0512	HW40L
	19-20-8	1.969	1 1/4	10	2.559	0.138	1.181	0.748			

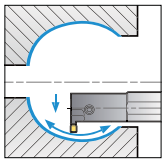
Applicable inserts **C12~C13**

KGIVR/L

For Grooving, Turning, Profiling machining

KGMI
KGMN





R type insert

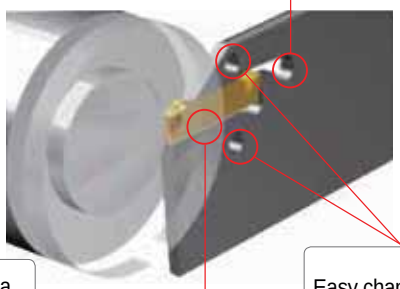
(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIVR/L	07-10-1.5	0.787	5/8	5	1.378	0.157	0.591	0.472	KGMN150-☐-☐	MHB0410	HW30L
	09-12-1.5	0.984	3/4	6	1.772	0.236	0.709	0.610		MHB0410	HW30L
	12-16-1.5	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	09-10-2	0.984	5/8	5	1.378	0.256	0.591	0.551	KGMI200-☐-☐	MHB0410	HW30L
	09-12-2	0.984	3/4	6	1.772	0.256	0.709	0.610		MHB0410	HW30L
	12-16-2	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	09-10-2.5	0.984	5/8	5	1.378	0.256	0.591	0.551	KGMN250-☐-☐	MHB0410	HW30L
	09-12-2.5	0.984	3/4	6	1.772	0.256	0.709	0.610		MHB0410	HW30L
	12-16-2.5	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	09-12-3	0.984	3/4	6	1.772	0.256	0.709	0.610	KGMN300-☐-☐	MHB0410	HW30L
	12-16-3	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	15-20-3	1.575	1 1/4	10	2.165	0.295	1.181	0.886		BHA0616	HW50L
	09-12-4	0.984	3/4	6	1.772	0.256	0.709	0.610	KGMN400-☐-☐	MHB0410	HW30L
	12-16-4	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	15-20-4	1.575	1 1/4	10	2.165	0.295	1.181	0.886		BHA0616	HW50L
	12-16-5	1.260	1	8	1.772	0.295	0.906	0.768	KGMN600-☐-☐	MHA0512	HW40L
	15-20-5	1.575	1 1/4	10	2.165	0.335	1.181	0.925		BHA0616	HW50L
	12-16-6	1.260	1	8	1.772	0.295	0.906	0.768		MHA0512	HW40L
	15-20-6	1.575	1 1/4	10	2.165	0.335	1.181	0.925		BHA0616	HW50L
	15-20-8	1.575	1 1/4	10	2.165	0.335	1.181	0.925	KGMN800-☐-☐	BHA0616	HW50L
	17-24-8	1.772	1 1/2	12	2.756	0.335	1.457	1.043		BHA0616	HW50L

Applicable inserts **C12~C13**

• External insert : Min. machining Dia(ØD) is over 1.969inch

KGT Blade for Parting off



Features

- Parting application with the use of existing KGT inserts
- Economical machining with a double sided insert
- Specially designed slot for strong and stable clamping
- Easy change of insert with the use of exclusive wrench

Code system

KGTBA 125 - 8 - S

- KGTB system(inch)
- Height of shank
- Cutting width
- S : Single pocket

How to clamp insert

① Insert the pin of wrench into the hole of blade.

② Clamp the insert on its seat after turning the handle to 45˚~160˚ for loosening the seat.

③ Finish clamp by removing the wrench after moving it back to its original state.

KGTB

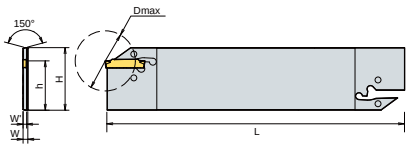


Fig. 1

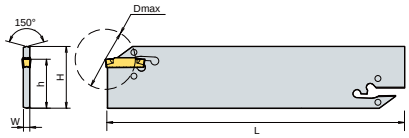


Fig. 2

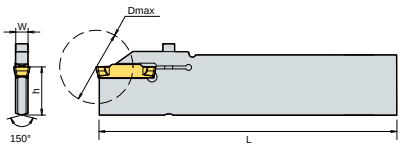


Fig. 3

(inch)

Designation		H	W	W'	L	h	D.max(2)	D.max(3)	Inserts	Wrench	Fig.
KGTBA	125-1.5	1 1/4	3/32	0.039	6	0.984	-	1.024	KG□□150-□-□	EW1203 (Separately ordered)	1
	125-2	1 1/4	3/32	0.071	6	0.984	1.968	1.535	KG□□200-□-□ KG□□200S-□-R(4)		
	125-3	1 1/4	3/32	-	6	0.984	3.937	1.535	KG□□300-□-□ KG□□300S-□-R(4)		2
	125-4	1 1/4	1/8	-	6	0.984	3.937	1.535	KG□□400-□-□ KG□□400S-□-R(4)		
	125-5	1 1/4	5/32	-	6	0.984	4.724	1.929	KG□□500-□-□ KG□□500S-□-R(4)		
	125-6	1 1/4	13/64	-	6	0.984	4.724	1.929	KG□□600-□-□ KG□□600S-□-R(4)		
	125-8-S(1)	1 1/4	1/4	-	6	0.984	3.149	2.323	KG□□800-□-□ KG□□800S-□-R(4)	HW30L	3

Applicable inserts **C14~C15**

(1) Screw clamping (2) 1 corner use (3) 2 corner use (4) 1 corner insert

Inserts are offered with two edges, for better economical machining

MGT Series

- Inserts are offered with two edges, for better economical machining
- Multi function operations - Reduce cycle time & increase productivity with the ability to groove, turn, face or copy in an application.
- Shorten time & save on tool cost - Korloy's MGT system allows a machinist to apply one tool against many applications, reducing the number of tools
- Flat Cutting Edge - MGT tools have a flat geometry on its cutting edge to ensure excellent surface finishes. Even in high Feed applications by using a wiper function, Korloy ensures excellent surface finishes in roughing operations.

Geometry of chip breaker

MGM(G)N-M

- Specially designed chip breaker allows a smoother chip flow versus conventional flat-top geometries through the use of a central chip breaker
- Specially placed convex dots assists with chip control in external machining, for a smoother chip flow.
- Chip breaker designed for turning & grooving applications

MGMN-G

- Specially designed chip breaker allows narrower chips to promote better chip flow
- Specifically designed for grooving applications

MRMN-M

- Full radius geometry for applications that require profiling
- Available for relief machining

MFMN300

- Specially designed chip breaker allows narrower chips to promote better chip flow
- Chip breaker specially designed for face-grooving

MRGN-A

- Specially designed high positive geometry, ideal for machining aluminum
- The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum

MGMR-PS

- Sharply designed cutting edge.
- Recommended in machining low carbon steel and stainless steel
- Specially designed chip breaker allows narrower chips to promote better chip flow.
- Able to machine Feed rates and small diameter cutting

MGMR-PT

- Stronger cutting edge with a negative land for tougher applications
- Able to machine at Feed rates as high and bar stock
- Chip breaker design helps narrows chips for better flow

MGMN-L

- Sharp cutting edge
- Low cutting resistance
- For auto CNC machine
- For small Dia. processing

MGMN-R

- Strong cutting edge
- For high Feed rate rocessing

MGMN-T

- For turning & grooving
- Reduced chipwidth & smooth chip control by dot designed on the top corner

MGGN-A

- Smooth chip flow
- Reduced build up on cutting edge

Parting off (MGMN / MGMR / L)

Workpiece	Cutting Speed(vc=sfm)											Feed(fn=ipr)				
	CVD					PVD					Uncoated	Cutting width (inch)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510	ST30A	0.079	0.118	0.157	0.197	0.236
SM□□C	260~590			260~590		260~590						0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
SCM	230~490	230~490	230~490	230~490	230~490	230~490			230~490			0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
GC/GCD				160~330						160~330	160~330	0.002~0.005	0.004~0.010	0.004~0.012	0.004~0.014	0.004~0.016
STS			160~390	160~390			160~390	200~460				0.001~0.004	0.001~0.006	0.003~0.010	0.004~0.014	0.005~0.016
Non-ferrous metal(AL, Copper)											660~148	0.002~0.004	0.002~0.008	0.002~0.012	0.002~0.012	0.002~0.014

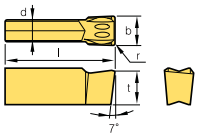
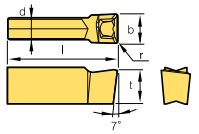
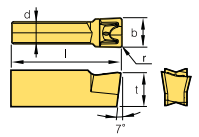
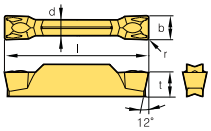
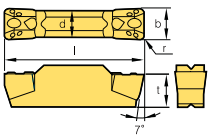
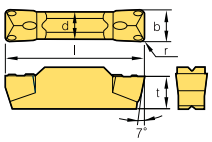
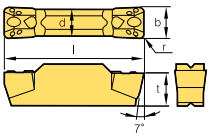
Facing (FGD / FGM / FMM / MFMN / MGMN)

Workpiece	Cutting Speed(vc=sfm)							Feed(fn=ipr)		
	CVD			PVD			Uncoated	Cutting width (inch)		
	NC6110	NC3030	NC5330	NC3120	PC3500	PC215K	PC8110 / PC5300	H01	0.118	0.157	0.197
SM□□C			330~528	330~528					0.002~0.004	0.002~0.005	0.002~0.006
SCM		160~430	160~430	160~430	160~430				0.002~0.004	0.002~0.005	0.002~0.006
GC/GCD	390~490		390~490			390~490			0.002~0.004	0.002~0.005	0.002~0.006
STS			200~490				200~490		0.002~0.004	0.002~0.005	0.002~0.006
Non-ferrous metal(AL, Copper)								660~2640	0.002~0.006	0.003~0.006	0.003~0.006

Grooving, Turning (MGMN / MRMN)

Workpiece	Cutting Speed(vc=sfm)												Feed(fn=ipr)					
	CVD				PVD				Cermet		Uncoated		Cutting width (inch)					
	NC3010	NC3120	NC3030	NC5330	PC215K	PC5300	PC230	PC3500	CN20	CT10	ST30A	ST20	0.020~0.039	0.039~0.079	0.079~0.118	0.118~0.157	0.157~0.197	0.236~0.315
SM□□C	260~660	260~660		260~660		260~590	260~660		260~400	260~400		260~400	0.001~0.003	0.002~0.004	0.002~0.004	0.002~0.005	0.002~0.006	0.002~0.006
SCM	260~590	260~590	260~590	260~590		260~530	260~590	260~590	260~400		260~400	260~400	0.001~0.003	0.002~0.003	0.002~0.003	0.002~0.004	0.002~0.005	0.002~0.006
GC/GCD				200~430		200~430							0.001~0.003	0.002~0.003	0.002~0.003	0.002~0.004	0.002~0.004	0.002~0.005
STS				200~330	200~330						200~330		0.001~0.003	0.002~0.004	0.002~0.004	0.002~0.005	0.002~0.005	0.002~0.006
Non-ferrous metal(AL, Copper)					190~990						190~1320		0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.006	0.003~0.006	0.004~0.008

Insert

Application	Picture	Designation		Cermet	Coated										Uncoated	Dimensions (inch)					Picture	Page
				CN20	NC3010	NC3030	NC3120	NC3220	NC5330	NC6210	NC9025	PC215K	PC5300	PC8110	PC9030	H01	b	r	l	d	t		
Face Grooving	FGD	FGD	300R-03			●						●					0.118	3/256	0.590	0.079	0.157		C32 C33
			400R-04			●						●					0.157	1/64	0.590	0.118	0.177		
			500R-04			●						●					0.197	1/64	0.590	0.157	0.197		
	FGM	FGM	300R-03														0.118	3/256	0.590	0.079	0.157		C32 C33
			400R-04			●											0.157	1/64	0.590	0.118	0.177		
			500R-04														0.197	1/64	0.590	0.157	0.197		
	FMM	FMM	300R-03			●								●			0.118	3/256	0.590	0.079	0.154		C32 C33
			400R-04			●											0.157	1/64	0.590	0.118	0.156		
			500R-04			●											0.197	1/64	0.590	0.157	0.174		
Face Grooving	MFMN	MFMN	300						●								0.118	1/128	0.709	0.079	0.118		C31 C36
Grooving · Turning	MGGN-M	MGGN	300-02-M	●													0.118	1/128	0.827	0.093	0.189		C26 C28 C30 C36
			300-04-M	●													0.118	1/64	0.827	0.093	0.189		
			300-08-M														0.118	1/32	0.827	0.093	0.189		
			400-02-M	●													0.157	1/128	0.827	0.130	0.189		
			400-04-M	●													0.157	1/26	0.827	0.130	0.189		
			400-08-M														0.157	1/32	0.827	0.130	0.189		
			500-02-M														0.197	1/128	1.024	0.161	0.228		
			500-04-M	●													0.197	1/64	1.024	0.161	0.228		
			500-08-M														0.197	1/32	1.024	0.161	0.228		
			600-02-M														0.236	1/128	1.024	0.197	0.228		
			600-04-M														0.236	1/64	1.024	0.197	0.228		
			600-08-M														0.236	1/32	1.024	0.197	0.228		
Grooving	MGMN-G	MGMN	150-G			●		●					●		●	●	0.059	0.006	0.630	0.047	0.138		C26 C28 C30 C36
			200-G			●	●	●							●	●	0.079	1/128	0.630	0.063	0.138		
			250-G			●		●					●		●		0.098	1/128	0.728	0.079	0.152		
			300-G			●	●		●		●				●		0.118	1/64	0.827	0.093	0.189		
			400-G			●	●						●		●		0.157	1/64	0.827	0.130	0.189		
			500-G														0.197	1/32	1.024	0.161	0.228		
			600-G														0.236	1/32	1.024	0.197	0.228		
Grooving · Turning	MGMN-M	MGMN	200-M			●	●	●	●				●		●	●	0.079	1/128	0.630	0.047	0.138		C26 C28 C30 C36
			250-M			●	●	●					●		●		0.098	1/128	0.728	0.079	0.152		
			300-02-M						●								0.118	1/128	0.827	0.093	0.189		
			300-M		●	●	●	●		●		●	●		●	●	0.118	1/64	0.827	0.093	0.189		
			350-03-M														0.138	3/256	0.827	0.130	0.189		
			400-02-M														0.157	1/128	0.827	0.130	0.189		
			400-M			●	●	●	●	●		●	●		●	●	0.157	1/64	0.827	0.130	0.189		
			500-04-M			●											0.197	1/64	1.024	0.161	0.228		
			500-M			●	●	●	●	●							0.197	1/32	1.024	0.161	0.228		
			600-M			●	●	●	●	●							0.236	1/32	1.024	0.197	0.228		
			800-M			●			●								0.315	1/32	1.220	0.236	0.256		

● : Stock item

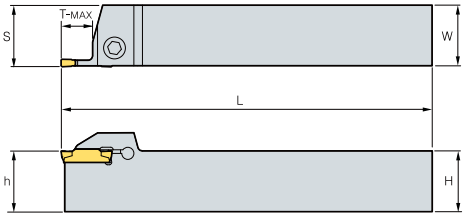
Insert

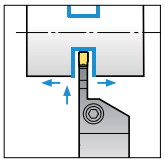
Application	Picture	Designation	Coated									Uncoated		Dimensions (inch)						Picture	Page
			NC3030	NC3120	NC3220	PC8110	PC9030	PC3525	PC5300	PC6510	PC230	NC5330	H01	G10	b	r	l	d	t	α°		
Grooving	MGMN-L	MGMN 200-02-L													0.079	1/128	0.630	0.063	0.138	-		C26 C28 C30 C31
		300-02-L							●						0.079	1/64	0.787	0.067	0.138	-		
		400-02-L							●						0.118	1/128	0.827	0.093	0.189	-		
		200-04-L													0.118	1/64	0.787	0.091	0.157	-		
		300-04-L													0.157	1/128	0.827	0.130	0.189	-		
		400-04-L													0.156	1/64	0.787	0.130	0.157	-		
		500-04-L							●						0.197	1/64	1.024	0.161	0.228	-		
Grooving · Parting off	MGMN-R	MGMN 200-02-R													0.079	1/128	0.630	0.063	0.138	-		C26 C28 C30 C31
		300-02-R	●						●						0.079	1/64	0.787	0.067	0.138	-		
		400-02-R	●						●						0.118	1/128	0.827	0.093	0.189	-		
		200-04-R													0.118	1/64	0.787	0.091	0.157	-		
		300-04-R													0.157	1/128	0.827	0.130	0.189	-		
		400-04-R													0.156	1/64	0.787	0.130	0.157	-		
		500-04-R	●						●						0.197	1/64	1.024	0.161	0.228	-		
Grooving · Turning	MGMN-T	MGMN 200-T													0.079	1/128	0.630	0.063	0.138	-		C26 C28 C30 C31
		300-T	●						●						0.118	1/64	0.827	0.093	0.189	-		
		400-T	●						●						0.157	1/64	0.827	0.130	0.189	-		
		500-T	●						●						0.197	1/32	1.024	0.161	0.228	-		
Grooving	MGGN-A	MGGN 300-02-A													0.118	1/128	0.827	0.093	0.189	-		C26 C28 C30 C36
		300-04-A													0.118	1/64	0.827	0.093	0.189	-		
		300-08-A													0.118	1/32	0.827	0.093	0.189	-		
		400-02-A													0.157	1/128	0.827	0.130	0.189	-		
		400-04-A													0.157	1/64	0.827	0.130	0.189	-		
		400-08-A													0.157	1/32	0.827	0.130	0.189	-		
		500-02-A													0.197	1/128	1.024	0.161	0.228	-		
		500-04-A													0.197	1/64	1.024	0.161	0.228	-		
		500-08-A													0.197	1/32	1.024	0.161	0.228	-		
Parting off	MGMR/L-PS	MGMR/L 300-6D-PS													0.118	0.008	0.827	0.098	0.118	0.189		C26 C28
		300-8D-PS													0.118	0.008	0.827	0.098	0.118	0.189		
		300-15D-PS													0.118	0.008	0.827	0.098	0.118	0.189		
		400-4D-PS													0.157	0.012	0.827	0.13	0.157	0.189		
		500-4D-PS													0.197	0.012	1.024	0.161	0.197	0.228		
Parting off	MGMR/L-PT	MGMR/L 200-6D-PT							●						0.079	0.008	0.630	0.063	0.079	0.142		C26 C28
		300-6D-PT													0.118	0.008	0.827	0.093	0.118	0.189		
		300-8D-PT			●										0.118	0.008	0.827	0.093	0.118	0.189		
		300-15D-PT													0.118	0.008	0.827	0.093	0.118	0.189		
		400-4D-PT													0.157	0.012	0.827	0.130	0.157	0.189		
		500-4D-PT													0.197	0.012	1.024	0.161	0.197	0.228		
Aluminum	MRGN-A	MRGN 400-A											●		0.157	5/64	0.827	0.130	0.157	-		C26 C27 C29 C30
		500-A													0.197	3/32	1.024	0.161	0.197	-		
		6N-A												●								
	MRGN-A	MRGN 600-A											●		0.236	15/64	1.024	0.197	0.236	-		C26 C27 C29 C30
		800-A											●		0.315	5/32	1.220	0.236	0.315	-		
Reliefing Profiling	MRMN-M	MRMN 200-M	●	●	●										0.079	3/64	0.630	0.059	0.079	-		C26 ~30 C36
		300-M	●	●	●		●		●			●			0.118	1/14	0.827	0.093	0.118	-		
		400-M	●	●	●					●		●			0.157	5/64	0.827	0.130	0.157	-		
		500-M	●		●				●						0.197	3/32	1.024	0.161	0.197	-		
		600-M	●		●							●			0.236	1/8	1.024	0.197	0.236	-		
		800-M	●		●							●			0.315	5/32	1.220	0.236	0.315	-		

● : Stock item

MGEHR/L

For Grooving, Turning, Parting off, Reliefing, Profiling machining





MGMN MGMR
MGGN MRMN
MRGN

R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	10-1.5	5/8	5/8	4	0.635	0.57	MGMN150-G	LTX0514	TW20L
	12-1.5	3/4	3/4	5	0.760	0.57			
	16-1.5	1	1	6	1.010	0.57			
	08-2	1/2	1/2	4	0.589	0.57	MGMN200-G MGMN200-M MGMR200-□□-□□	MHA0512	HW40L
	10-2	5/8	5/8	4	0.635	0.57			
	12-2	3/4	3/4	5	0.760	0.57			
	16-2	1	1	6	1.010	0.57			
	10-2.5	5/8	5/8	4	0.637	0.65	MGMN250-G MGMN250-M	MHA0512	HW40L
	12-2.5	3/4	3/4	5	0.762	0.65			
	16-2.5	1	1	6	1.012	0.65			
	10-3	5/8	5/8	4	0.639	0.72	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R	BHA0616	HW50L
	12-3	3/4	3/4	5	0.764	0.70			
	12-3-T03	3/4	3/4	5	0.764	0.39			
	16-3	1	1	6	1.014	0.70			
	16-3-T03	1	1	6	1.014	0.39			
	20-3	1 1/4	1 1/4	6 3/4	1.264	0.70			
	20-3-T03	1 1/4	1 1/4	6 3/4	1.264	0.39			
	12-4	3/4	3/4	5	0.766	0.70	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R		
	12-4-T03	3/4	3/4	5	0.766	0.39			
	16-4	1	1	6	1.016	0.70			
	16-4-T03	1	1	6	1.016	0.39			
	20-4	1 1/4	1 1/4	6 3/4	1.266	0.70			
	20-4-T03	1 1/4	1 1/4	6 3/4	1.266	0.39			
	12-5	3/4	3/4	5	0.770	0.90	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R		
	12-5-T05	3/4	3/4	5	0.770	0.59			
	16-5	1	1	6	1.020	0.90			
	16-5-T05	1	1	6	1.020	0.59			
	20-5	1 1/4	1 1/4	6 3/4	1.270	0.90			
	20-5-T05	1 1/4	1 1/4	6 3/4	1.270	0.59			
	12-6	3/4	3/4	5	0.774	0.90	MGMN600-M MGGN600-□□-M MRMN600-M		
	12-6-T05	3/4	3/4	5	0.774	0.59			
	16-6	1	1	6	1.024	0.90			
	16-6-T05	1	1	6	1.024	0.59			
	20-6	1 1/4	1 1/4	6 3/4	1.274	0.90			
	20-6-T05	1 1/4	1 1/4	6 3/4	1.274	0.59			
	16-8	1	1	6	1.043	1.10	MRMN800-M MGMN800-M		
	16-8-T05	1	1	6	1.043	0.59			
	20-8	1 1/4	1 1/4	6 3/4	1.293	1.10			
	20-8-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			
	16-6A	1	1	6	1.024	0.90	MRGN600-A		
	16-6A-T05	1	1	6	1.024	0.59			
	20-6A	1 1/4	1 1/4	6 3/4	1.274	0.90			
	20-6A-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			
	16-8A	1	1	6	1.043	1.10	MRGN800-A		
	16-8A-T05	1	1	6	1.043	0.59			
	20-8A	1 1/4	1 1/4	6 3/4	1.293	1.10			
	20-8A-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			

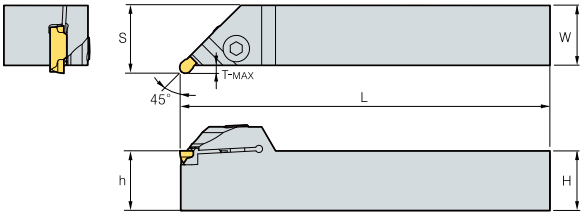
Applicable inserts **C24~C25**

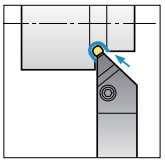
● : Stock item

MGEUR/L

For Reliefing, Profiling machining

MRMN
MRGN





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEUR/L	12-3	3/4	3/4	5	0.967	0.11	MRMN300-M	BHA0616	HW50L
	16-3	1	1	6	1.217	0.11			
	20-3	1 1/3	1 1/4	6 3/4	1.467	0.11			
	12-4	3/4	3/4	5	0.967	0.11	MRMN400-M		
	16-4	1	1	6	1.217	0.11			
	20-4	1 1/4	1 1/4	6 3/4	1.467	0.11			
	12-5	3/4	3/4	5	1.026	0.15	MRMN500-M		
	16-5	1	1	6	1.276	0.15			
	20-5	1 1/4	1 1/4	6 3/4	1.526	0.15			
	12-6	3/4	3/4	5	1.222	0.15	MRMN600-M		
	16-6	1	1	6	1.276	0.15			
	20-6	1 1/4	1 1/4	6 3/4	1.526	0.15			
	16-8	1	1	6	1.354	0.19	MRMN800-M		
	20-8	1 1/4	1 1/4	6 3/4	1.604	0.19			
	16-6A	1	1	6	1.276	0.15	MRGN600-A		
	20-6A	1 1/4	1 1/4	6 3/4	1.526	0.15			
	16-8A	1	1	6	1.354	0.19	MRGN800-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.604	0.19			

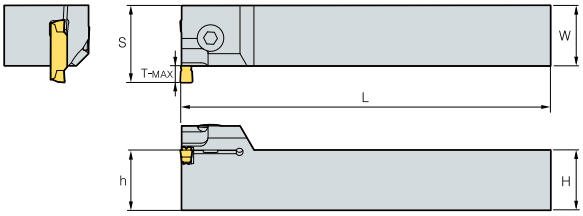
Applicable inserts **C24~C25**

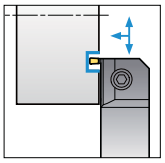
● : Stock item

MGEVR/L

For Grooving, Turning, Profiling machining

MGMN MGGN
MRMN MRGN





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	Min. machining Dia. (ØD)	Inserts	Screw	Wrench
MGEVR/L	12-1.5	3/4	3/4	5	0.868	0.11	10	MGMN150-G	LTX0514	TW20L
	16-1.5	1	1	6	1.118	0.11	10			
	20-1.5	1 1/4	1 1/4	6 3/4	1.368	0.11	10			
	12-2	3/4	3/4	5	0.888	0.13	5 1/8	MGMN200-M MGMN200-G	BHA0616	HW50L
	16-2	1	1	6	1.138	0.13	5 1/8			
	20-2	1 1/4	1 1/4	6 3/4	1.388	0.13	5 1/8			
	12-2.5	3/4	3/4	5	0.907	0.15	4	MGMN250-M MGMN250-G		
	16-2.5	1	1	6	1.157	0.15	4			
	20-2.5	1 1/4	1 1/4	6 3/4	1.407	0.15	4			
	12-3	3/4	3/4	5	0.967	0.21	4 5/16	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R		
	16-3	1	1	6	1.217	0.21	4 5/16			
	20-3	1 1/4	1 1/4	6 3/4	1.467	0.21	4 5/16			
	12-4	3/4	3/4	5	0.967	0.21	4	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	16-4	1	1	6	1.217	0.21	4			
	20-4	1 1/4	1 1/4	6 3/4	1.467	0.21	4			
	12-5	3/4	3/4	5	1.026	0.27	4	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R		
	16-5	1	1	6	1.276	0.27	4			
	20-5	1 1/4	1 1/4	6 3/4	1.526	0.27	4			
	12-6	3/4	3/4	5	1.222	0.27	3 1/2	MGMN600-M MGGN600□□-M MRMN600-M		
	16-6	1	1	6	1.276	0.27	3 1/2			
	20-6	1 1/4	1 1/4	6 3/4	1.526	0.27	3 1/2			
	16-8	1	1	6	1.354	0.35	2	MRMN800-M MGMN800-M		
	20-8	1 1/4	1 1/4	6 3/4	1.604	0.35	2			
	16-8A	1	1	6	1.276	0.27	3 1/2	MRGN600-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.526	0.27	3 1/2			
	16-8A	1	1	6	1.354	0.35	2	MRGN800-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.604	0.35	2			

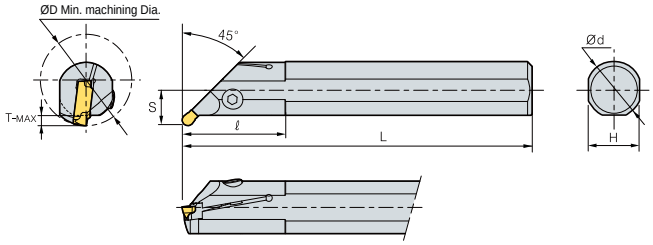
Applicable inserts **C24~C25**

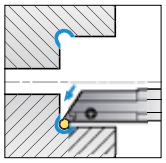
● : Stock item

MGIUR/L

For Reliefing, Profiling machining

MRMN
MRGN





R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	23-12-3	1 7/16	3/4	6	1.772	0.13	0.670	0.512	MRMN300-M	MHA0512	HW40L
	26-16-3	1 5/8	1	8	1.772	0.13	0.920	0.610			
	32-20-3	2	1 1/4	10	2.559	0.13	1.170	0.748			
	23-12-4	1 7/16	3/4	6	1.772	0.13	0.670	0.512	MRMN400-M		
	26-16-4	1 5/8	1	8	1.772	0.13	0.920	0.610			
	32-20-4	2	1 1/4	10	2.559	0.13	1.170	0.748			
	26-16-5	1 5/8	1	8	1.772	0.13	1.920	0.610	MRMN500-M	BHA0616 BHA0620	HW50L
	32-20-5	2	1 1/4	8	1.772	0.13	1.170	0.748			
	26-16-6	1 5/8	1	10	2.559	0.13	1.920	0.748	MRMN600-M	BHA0616 BHA0620	
	32-20-6	2	1 1/4	10	2.559	0.13	1.170	0.748			
	26-16-8	1 5/8	1	8	1.772	0.13	0.920	0.610	MRMN800-M	BHA0616 BHA0620	
	32-20-8	2	1 1/4	10	2.559	0.25	1.170	0.748			
	26-16-6A	1 5/8	1	8	1.772	0.25	0.920	0.610	MRGN600-A	BHA0616 BHA0620	
	32-20-6A	2	1 1/4	10	2.559	0.13	1.170	0.748			
	26-16-8A	1 5/8	1	8	1.772	0.25	0.920	0.728	MRGN800-A	BHA0616 BHA0620	
	32-20-8A	2	1 1/4	10	2.559	0.25	1.170	0.866			

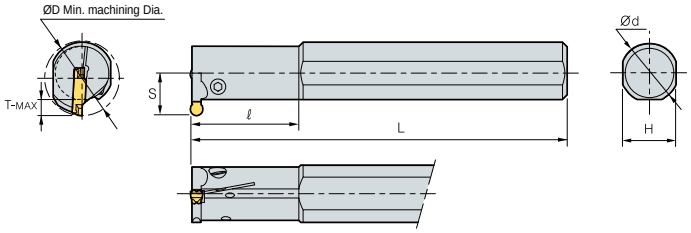
Applicable inserts **C24~C25**

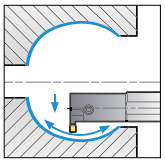
● : Stock item

MGIVR/L

For Grooving, Turning, Profiling machining

MGMN MRMN
MGGN MRGN





R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIVR/L	12-10-1.5	3/4	5/8	5	1.378	0.15	0.545	0.445	MGMN150-G	MHB0310	HW25L
	16-12-1.5	1	3/4	6	1.772	0.15	0.670	0.516		MHA0512	HW40L
	18-16-1.5	1 1/4	1	8	1.772	0.15	0.920	0.638			
	12-10-2	3/4	5/8	5	1.378	0.19	0.545	0.448	MGMN200-G MGMN200-M MRMN200-M	MHB0310	HW25L
	16-12-2	1	3/4	6	1.772	0.19	0.670	0.551		MHA0512	HW40L
	18-16-2	1 1/4	1	8	1.772	0.19	0.920	0.677			
	12-10-2.5	3/4	5/8	5	1.378	0.23	0.545	0.482	MGMN250-G MGMN250-M	MHB0310	HW25L
	16-12-2.5	1	3/4	6	1.772	0.23	0.670	0.594		MHA0512	HW40L
	18-16-2.5	1 1/4	1	8	1.772	0.23	0.920	0.717			
	16-12-3	1	3/4	6	1.772	0.23	0.670	0.614	MGMN300-M/G/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R	MHA0512	HW40L
	20-16-3	1 1/4	1	8	1.772	0.23	0.920	0.744			
	24-20-3	1 1/2	1 1/4	10	2.559	0.23	1.170	0.846			
	16-12-4	1	3/4	6	1.772	0.23	0.670	0.614	MGMN400-M/G/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	20-16-4	1 1/4	1	8	1.772	0.23	0.920	0.744			
	24-20-4	1 1/2	1 1/4	10	2.559	0.23	1.170	0.846			
	20-16-5	1 1/4	1	8	1.772	0.31	0.920	0.764	MGMN500-M/G/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R	BHA0616	HW50L
	24-20-5	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	20-16-6	1 1/4	1	8	1.772	0.31	0.920	0.764	MGMN600-MG MGGN600-□□-M MRMN600-M	BHA0616	
	24-20-6	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	29-24-8	1 1/2	1 1/4	10	2.559	0.39	1.170	0.921	MRMN800-M MGMN800-M		
	29-24-8	1 13/16	1 1/2	12	2.756	0.39	1.380	1.071			
	20-16-6A	1 1/4	1	8	1.772	0.31	0.920	0.764	MRGN600-A	BHA0616	
	24-20-6A	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	24-20-8A	1 1/2	1 1/4	10	2.559	0.39	1.170	0.921	MRGN800-A		
	29-24-8A	1 13/16	1 1/2	12	2.756	0.39	1.380	1.071			

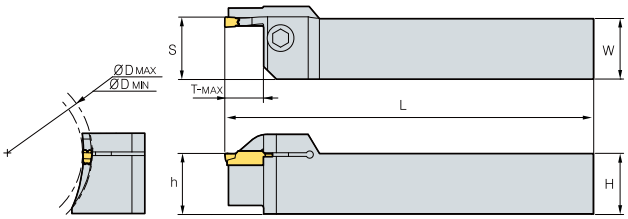
Applicable inserts **C24~C25**

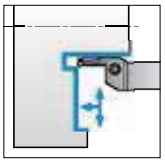
● : Stock item

MGFHR/L

For Face Grooving machining

MFMN
MGMN





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFHR/L	16-3-09/13-T03	1	1	6	1.008	0.393	0.945	1.378	MFMN300	BHA0616	HW50L
	16-3-11/15-T03	1	1	6	1.008	0.393	1.142	1.575			
	16-3-13/19-T03	1	1	6	1.008	0.393	1.339	1.969			
	16-3-17/27-T03	1	1	6	1.008	0.393	1.732	2.756			
	16-3-25/38-T03	1	1	6	1.008	0.393	2.520	3.898			
	16-4-24/47-T05	1	1	6	1.008	0.393	2.441	4.724	MGMN400-M/T MGMN400-□□-L/R		
	16-4-44/78-T05	1	1	6	1.008	0.393	4.409	7.874			

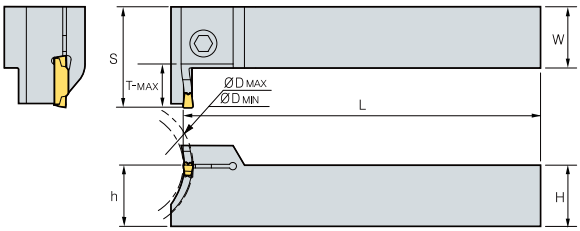
Applicable inserts **C24~C25**

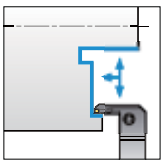
● : Stock item

MGFVR/L

For Face Grooving machining

MFMN
MGMN





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFVR/L	16-3-09/13-T03	1	1	6	1.417	0.393	0.945	1.378	MFMN300	MHA0512	HW40L
	16-3-11/15-T03	1	1	6	1.417	0.393	1.142	1.575			
	16-3-13/19-T03	1	1	6	1.417	0.393	1.339	1.969			
	16-3-17/27-T03	1	1	6	1.417	0.393	1.732	2.755			
	16-3-25/38-T03	1	1	6	1.417	0.393	2.519	3.897			
	16-4-17/25-T03	1	1	6	1.614	0.590	1.732	2.362	MGMN400-M/T MGMN400-□□-L/R	BHA0616	HW50L
	16-4-23/47-T05	1	1	6	1.614	0.590	2.362	4.724			
	16-4-44/78-T05	1	1	6	1.614	0.590	4.409	7.874			

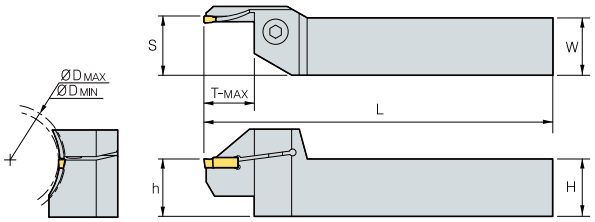
Applicable inserts **C24~C25**

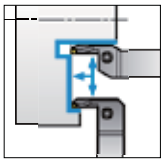
● : Stock item

FGHH

For Face Grooving, Turning machining

FGD FGM FMM





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
FGHH	12R-3 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM300R-03	BHA0616	HW50L
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	3/4	3/4	5	0.774	0.866	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.866	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.866	3.937	5.512			
	16R-3 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM300R-03		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	1	1	6	1.024	0.866	2.362	2.953			
	29/39	1	1	6	1.024	0.866	2.953	3.937			
	39/55	1	1	6	1.024	0.866	3.937	5.512			
	12R-4 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM400R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-4 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM400R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			
	12R-5 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM500R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/15	3/4	3/4	5	0.774	0.787	1.378	1.575			
	15/18	3/4	3/4	5	0.774	0.787	1.575	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-5 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM500R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/15	1	1	6	1.024	0.787	1.378	1.575			
	15/18	1	1	6	1.024	0.787	1.575	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			

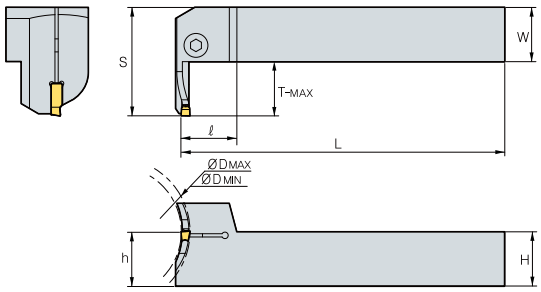
Applicable inserts **C24~C25**

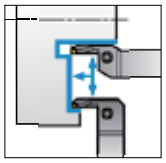
● : Stock item

FGVH

For Face Grooving, Turning machining

FGD FGM FMM





R type insert

(inch)

Designation		H=(h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
FGVH	12R-3 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM300R-03	BHA0616	HW50L
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	3/4	3/4	5	0.774	0.866	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.866	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.866	3.937	5.512			
	16R-3 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM300R-03		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	1	1	6	1.024	0.866	2.362	2.953			
	29/39	1	1	6	1.024	0.866	2.953	3.937			
	39/55	1	1	6	1.024	0.866	3.937	5.512			
	12R-4 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM400R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-4 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM400R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			
	12R-5 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM500R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/15	3/4	3/4	5	0.774	0.787	1.378	1.575			
	15/18	3/4	3/4	5	0.774	0.787	1.575	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-5 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM500R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/15	1	1	6	1.024	0.787	1.378	1.575			
	15/18	1	1	6	1.024	0.787	1.575	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			

Applicable inserts **C24~C25**

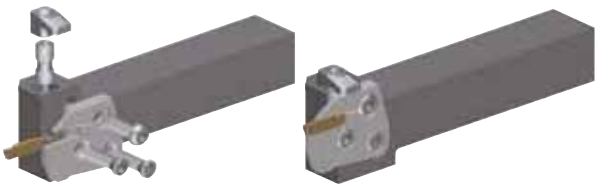
● : Stock item

MGT Cartridge

System Figure

- ▶ Compatible and Economical due to divided cartridge & exclusive holder system from existing single body system
- ▶ Interchangeable cartridge
  - Various assembly depends on working style
  - Reduce cutting tool costs by over 30%
  - Setting with upper clamp & side screw
- ▶ Strong & Stable setting force
  - Simultaneous assembly of insert & cartridge
  - Easy assembly & tool exchange
- ▶ Stable assembly system
  - Simple & Superior setting force

Stable Assembly thanks to double screw & clamp



Simple & Strong Setting

Holder Code System

MC	H	R/L	25	25
MGT-Cartridge System	Holder Style	Hand	Height (mm)	Width (mm)

H : Horizontal
V : Vertical

Holder

Horizontal Type		Vertical Type	
			
MCHR	MCHL	MCVR	MCVL
External process : MCER Facing process : MCFL	External process : MCEL Facing process : MCFR	External process : MCEL Facing process : MCFR	External process : MCER Facing process : MCFL

Cartridge Code System

MC	F	R/L	3	24/35	T16
MGT-Cartridge System	Working Style	Hand	Cutting Width (mm)	Facing Dia. (mm)	Maximum Depth (mm)

E : External Process
F : Facing Process

Cartridge

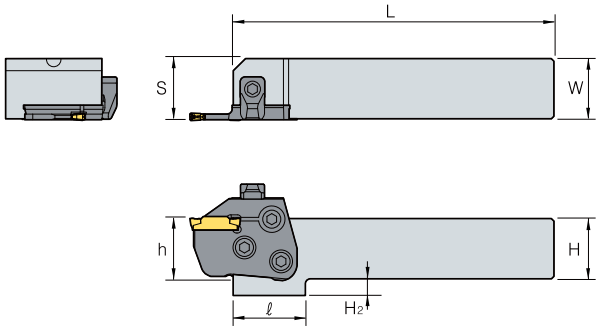
External Process		Facing Process	
			
MCER	MCEL	MCFR	MCFL

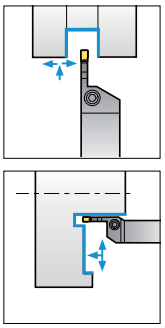
MCHR/L

(Holder)

For Grooving, Turning, Parting off, Reliefing, Profiling machining

MCER/L
MCFR/L





R type insert

(inch)

Designation		H=(h)	W	L	S	ℓ	H2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCHR/L	2020	0.787	0.787	5.236	0.815	1.181	0.472	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	0.984	0.984	5.236	1.012	1.181	0.276						
	3232	1.260	1.260	6.024	1.287	-	-						

Applicable inserts **C36**

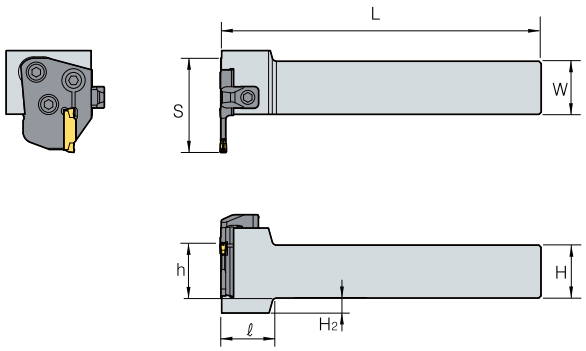
● : Stock item

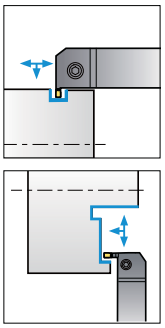
MCVR/L

(Holder)

For Face Grooving, Turning machining

MCER/L
MCFR/L





R type insert

(inch)

Designation		H=(h)	W	L	S	ℓ	H2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCVR/L	2020	0.787	0.787	5.906	1.469	1.181	0.472	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	0.984	0.984	5.906	1.693	1.181	0.276						
	3232	1.260	1.260	6.693	1.969	-	-						

Applicable inserts **C36**

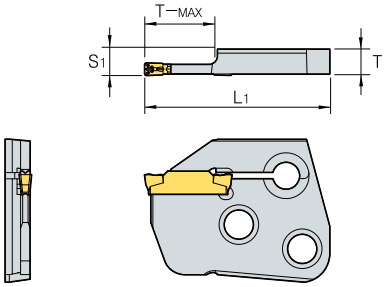
● : Stock item

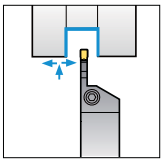
MCER/L

(Cartridge)

For Grooving, Turning, Parting off, Reliefing, Profiling machining

MGMN MGMR
MGGN MRMN





R type insert

(inch)

Designation		T	L1	S1	T-MAX	Inserts		Holder
						Width	Designation	
MCER/L	3-T16	0.236	1.752	0.250	0.630	0.118	MGMN	MCVR/L MCHR/L
	4-T16	0.235	1.752	0.250	0.630	0.157	MGMR/L	
	5-T20	0.231	1.909	0.250	0.787	0.197	MGGN	
	6-T20	0.229	1.909	0.250	0.787	0.236	MRMN	

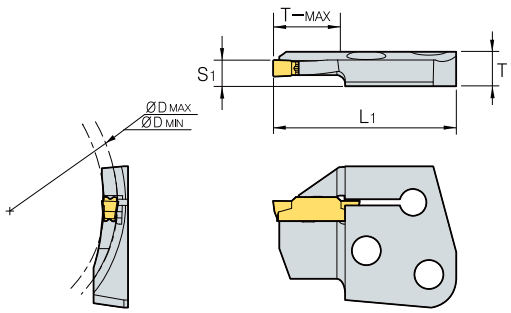
Applicable inserts **C24, C25**

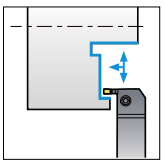
MCFR/L

(Cartridge)

For Face Grooving, Turning machining

MFNM
MGMN





R type insert

(inch)

Designation		T	L1	S1	T-MAX	ØD		Inserts		Holder
						Min	Max	Width	Designation	
MCFR/L	3-24/35-T16	0.315	1.752	0.250	0.630	0.944	1.378	0.118	MFMN300	MCVR/L MCHR/L
	3-29/40-T16	0.315	1.752	0.250	0.630	1.142	1.575	0.118		
	3-34/50-T16	0.315	1.752	0.250	0.630	1.339	1.969	0.118		
	3-44/70-T16	0.315	1.752	0.250	0.630	1.732	2.756	0.118		
	3-64/99-T16	0.315	1.752	0.250	0.630	2.519	3.898	0.118		
	4-44/60-T16	0.314	1.752	0.250	0.630	1.339	2.362	0.157	MGMN400	
	4-60/120-T16	0.314	1.752	0.250	0.630	2.362	4.724	0.157		
	4-112/200-T16	0.314	1.752	0.250	0.630	4.409	7.874	0.157		

Applicable inserts **C24, C25**

MGT - Machining Al Wheels

Features

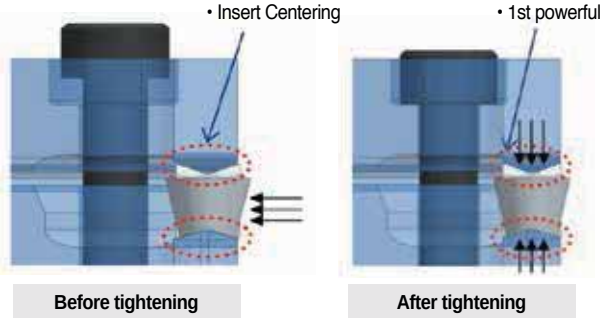
- ▶ Optimally designed inserts for aluminum wheel machining
- ▶ Longer tool life when matched with the best grade for application
- ▶ Unique clamping mechanism places a strong clamp over the insert
- ▶ A variety of insert types for multi application functions

Various insert types

MRGN type : Full “Round” geometry

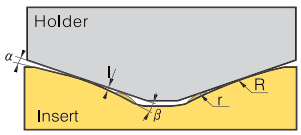
MRGN-A(For general)	MRGN-A5(For copying)	MRGN-AM(Medium finishing)	MRGN-AP(PCD)	MVGN-A(For fine finishing)
				
High rake angle, Sharp cutting edge	Reinforced clamping force	For ductile cast iron	Improved chip control	High rake and relief angle

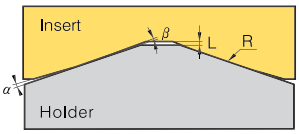
New clamping system



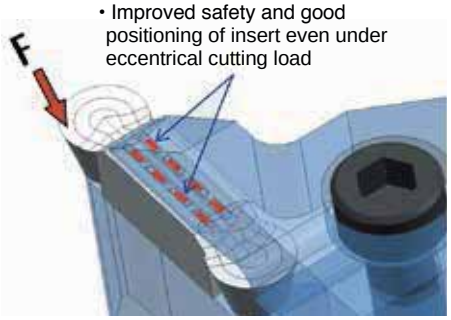
•Reinforcing the clamping force due to radius designed on the top & bottom side of insert and convex“DOT”on the top of insert

PATENT

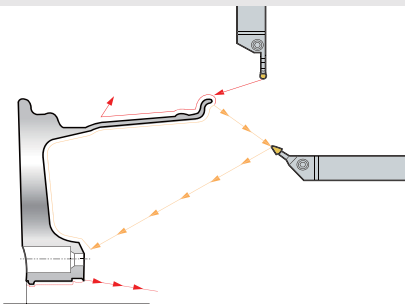
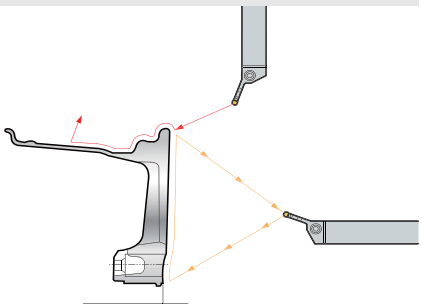
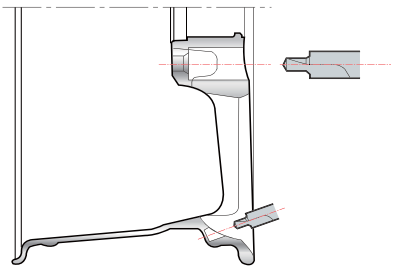




• Improved safety and good positioning of insert even under eccentrical cutting load



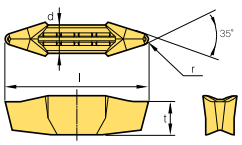
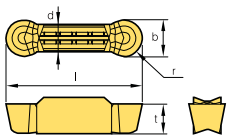
Application of Al Wheels

Machining A	Machining B	Machining C
		

Recommended cutting condition

Workpiece		Hardness Brinell (HB)	kc (MPa)	vc (sfm)	fn (ipr)
Aluminum alloy (Forged)	Unhardened	50 ~ 70	500 ~ 600	3,300~8,300	0.004~0.024
	Hardened	90 ~ 110	700 ~ 900	1,000~3,300	0.004~0.020
Aluminum alloy (Cast)	Unhardened	70 ~ 80	700 ~ 800	1,000~3,300	0.004~0.020
	Hardened	80 ~ 110	800 ~ 950	650~2,000	0.004~0.016
Copper alloy		90 ~ 110	700 ~ 900	1,000~2,600	0.004~0.020
Magnesium alloy		70 ~ 80	700 ~ 800	1,000~3,300	0.004~0.020

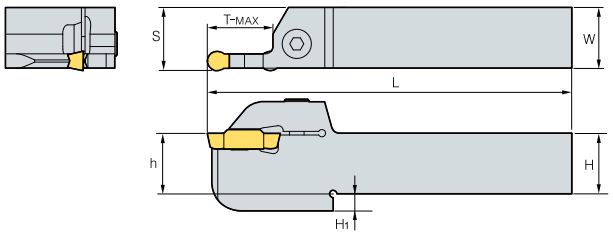
Insert

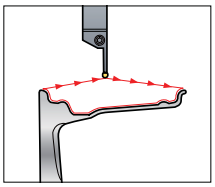
Application	Picture	Designation		Coated	Uncoated	Dimensions (inch)					Configuration	Page
				DP150	G10	b	r	l	d	t		
For Aluminum Wheel		MVGN	8N-A-R1.2		●	-	3/64	1.181	0.315	0.272		C40
			8N-A-R1.6			-	1/16	1.181	0.315	0.272		
		MRGN	6N-A		●	0.236	1/8	1.024	0.283	0.232		C39 C40
			6N-AM			0.236	1/8	1.024	0.283	0.232		
			6N-AP			0.236	1/8	1.024	0.283	0.232		
			6N-A5		●	0.236	1/8	1.024	0.283	0.232		
			8N-A			0.315	5/32	1.181	0.315	0.256		
			8N-AM			0.315	5/32	1.181	0.315	0.256		
			8N-AP			0.315	5/32	1.181	0.315	0.256		
			8N-A5		●	0.315	5/32	1.181	0.315	0.256		

● : Stock item

MGEHR/L

MRGN





R type insert

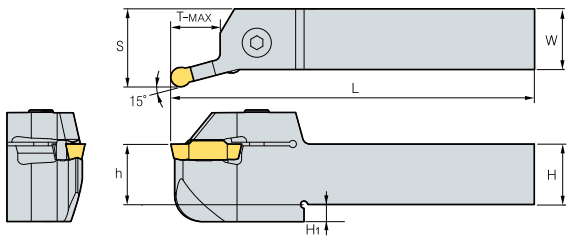
(inch)

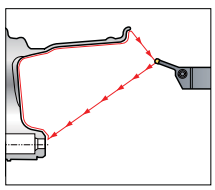
Designation		H=(h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	16N-6A	1	1	1	6	1.006	0.93	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	20N-6A	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-6A5	1	1	1	6	1.006	0.93	MRGN6N-A5		
	20N-6A5	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-8A	1	1	1	6	1.006	0.93	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	20N-8A	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-8A5	1	1	1	6	1.006	0.93	MRGN8N-A5		
	20N-8A5	1 1/4	1 1/4	1 1/4	6	1.281	1.06			

Applicable inserts **C38**

MGEHR/L-15

MRGN





R type insert

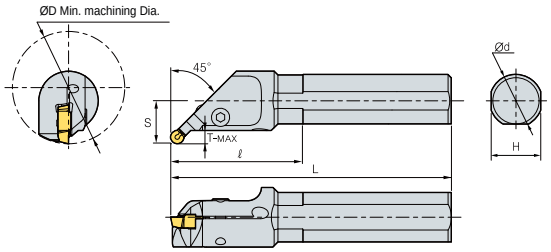
(inch)

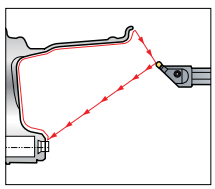
Designation		H=(h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	16N-6A-15	1	0.276	1	6	1.268	0.79	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	20N-6A-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-6A5-15	1	0.276	1	6	1.268	0.79	MRGN6N-A5		
	20N-6A5-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-8A-15	1	0.276	1	6	1.268	0.79	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	20N-8A-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-8A5-15	1	0.276	1	6	1.268	0.79	MRGN8N-A5		
	20N-8A5-15	1 1/4	0.315	1 1/4	6	1.543	0.98			

Applicable inserts **C38**

MGIUR/L-MR

MRGN





R type insert

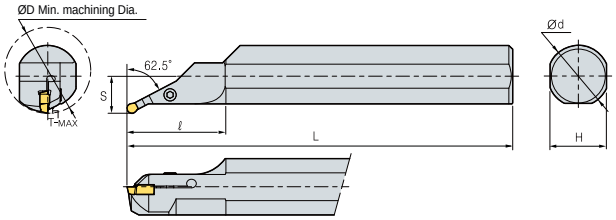
(inch)

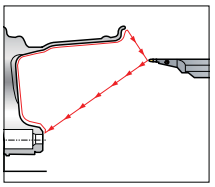
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	4420-8A-MR	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	4420-8A5-MR	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023			

Applicable inserts **C38**

MGIXR/L-MR

MRGN





R type insert

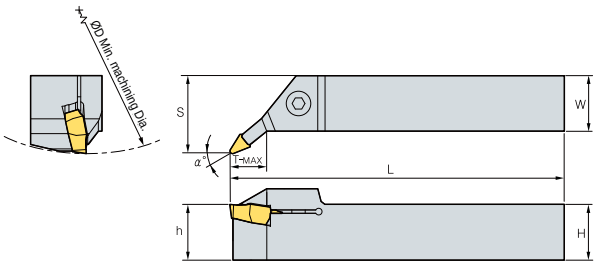
(inch)

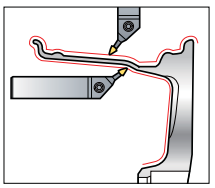
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIXR/L	4632-8A-MR	2 3/4	2	14	3.150	0.303	1.811	1.188	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	4632-8A5-MR	2 3/4	2	14	3.150	0.303	1.811	1.188			

Applicable inserts **C38**

MGEXR/L

MVGN





R type insert

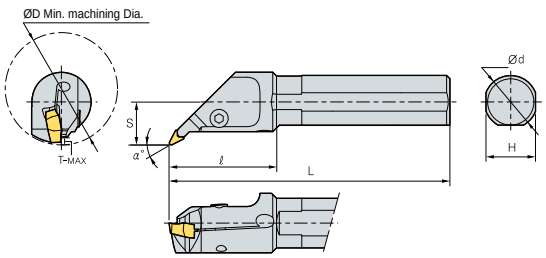
(inch)

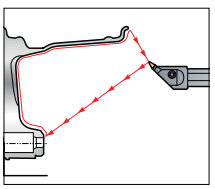
Designation		H=(h)	W	L	S	T-MAX	α°	Inserts	Screw	Wrench
MGEXR/L	16N-8A-5V	1	1	6	1.142	0.98	51	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L
	16N-8A-22.5V	1	1	6	1.378	1.06	22.5			

Applicable inserts **C38**

MGIUR/L-MV

MVGN





R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	α°	Inserts	Screw	Wrench
MGIUR/L	4420-8A-NV	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023	27.5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L

Applicable inserts **C38**

For deep hole grooving/parting off

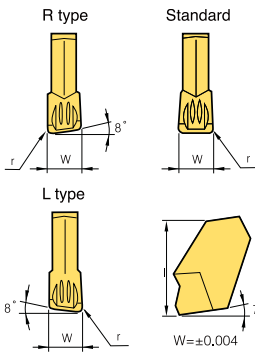
Saw-man

Features of parting insert

- Possible to machine a wide range of workpieces such as steel, cast iron, stainless steel, etc.
- Extended tool life due to low resistance rake angle
- Minimized burr due to minimal Nose R
- Various lead angle available
- Narrow chip curl due to dots on rake surface of insert

Workpiece	Cutting Speed(vc=sfm)											Feed(fn=ipr)				
	CVD					PVD					Uncoated	Cutting width (inch)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510	ST30A	0.079	0.118	0.157	0.197	0.236
SM□□C	260~590			260~590		260~590						0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
SCM	230~490	230~490	230~490	230~490	230~490	230~490			230~490			0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
GC/GCD				50~100						160~330	160~330	0.002~0.005	0.004~0.010	0.004~0.012	0.004~0.014	0.004~0.016
STS			160~390	160~390			160~390	200~460				0.001~0.004	0.001~0.006	0.003~0.010	0.004~0.014	0.005~0.016
Non-ferrous metal (AL, Copper)											660~1480	0.002~0.004	0.002~0.008	0.002~0.010	0.002~0.012	0.002~0.014

Insert

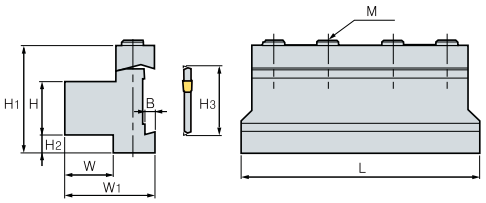
Application	Picture	Designation		Coated												Un-coated	Dimensions (inch)			Configuration
				NC3120	NC3220	NC3030	NCM325	NC5330	NC9020	PC3500	NC500H	PC8110	PC5300	PC9030	PC6510	ST30A	W	l	r	
Parting tools		SP	160														0.063	0.307	0.006	
			180														0.071	0.366	0.006	
			200		●	●	●	●				●	●	●			0.087	0.366	0.008	
			200R		●	●								●			0.087	0.366	0.008	
			200L											●			0.087	0.366	0.008	
			300	●	●	●	●	●	●			●	●	●		●	0.122	0.445	0.008	
			300R		●	●	●					●					0.122	0.445	0.008	
			300L			●											0.122	0.445	0.008	
			400	●	●	●	●	●				●	●	●	●		0.161	0.445	0.010	
			400R		●	●						●					0.161	0.445	0.010	
			400L			●											0.161	0.445	0.010	
			500	●	●	●	●	●			●	●	●		●		0.201	0.449	0.012	
			500R														0.201	0.449	0.012	
			500L														0.201	0.449	0.012	
			600		●	●		●					●		●		0.252	0.449	0.014	
			600R														0.252	0.449	0.014	
			600L														0.252	0.449	0.014	

● : Stock item

SMBBA

(Block)

SPBA□□□(-S)
KGTB□□□□



(inch)

Designation		H	W	H3	L	H1	H2	W1	B	M	Blades	Wrench
SMBBA	0610	5/8	5/8	1.024	3	1.496	0.472	0.181	0.157	3-M6	SPBA□□□(-S) KGTB□□□□	HW50L
	0710	3/4	3/4	1.024	3 3/8	1.693	0.354	1.496	0.209	3-M6		
	0712	3/4	3/4	1.260	4	1.969	0.512	1.496	0.209	4-M6		
	1010	1	29/32	1.024	4 3/8	1.693	0.157	1.654	0.209	4-M6		
	1212	1	29/32	1.260	4 3/8	1.969	0.315	1.654	0.209	4-M6		
	1212	1 1/4	1 3/16	1.260	4 3/8	2.126	0.197	1.890	0.209	4-M6		

Applicable inserts **C41**

SPBA/SPBA-S

(Blades)

SP

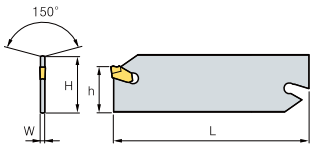


Fig. 1

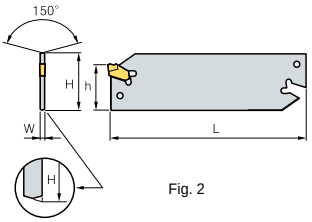
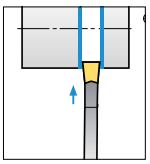


Fig. 2



(inch)

Designation		H	W	L	h	Inserts	Wrench		Fig.
SPBA	100-2	1	1/16	4 3/8	0.827	SP200, 200R/L	SW50L	-	1
	100-3	1	3/32	4 3/8	0.827	SP300, 300R/L			
	100-4	1	1/8	4 3/8	0.827	SP400, 400R/L			
	100-5	1	5/32	4 3/8	0.827	SP500, 500R/L			
	100-6	1	13/64	4 3/8	0.827	SP600, 600R/L			
	125-2	1 1/4	1/16	6	0.984	SP200, 200R/L			
	125-3	1 1/4	3/32	6	0.984	SP300, 300R/L			
	125-4	1 1/4	1/8	6	0.984	SP400, 400R/L			
	125-5	1 1/4	5/32	6	0.984	SP500, 500R/L			
	125-6	1 1/4	13/64	6	0.984	SP600, 600R/L			
SPBA-S	100-S-2	1	1/16	4 3/8	0.827	SP200, 200R/L	-	SW15S	2
	100-S-3	1	3/32	4 3/8	0.827	SP300, 300R/L			
	100-S-4	1	1/8	4 3/8	0.827	SP400, 400R/L			
	100-S-5	1	5/32	4 3/8	0.827	SP500, 500R/L			
	100-S-6	1	13/64	4 3/8	0.827	SP600, 600R/L			
	125-S-2	1 1/4	1/16	6	0.984	SP200, 200R/L			
	125-S-3	1 1/4	3/32	6	0.984	SP300, 300R/L			
	125-S-4	1 1/4	1/8	6	0.984	SP400, 400R/L			
	125-S-5	1 1/4	5/32	6	0.984	SP500, 500R/L			
	125-S-6	1 1/4	13/64	6	0.984	SP600, 600R/L			

Applicable inserts **C41**

SPHA/SPHA-S

(Holder)

SP

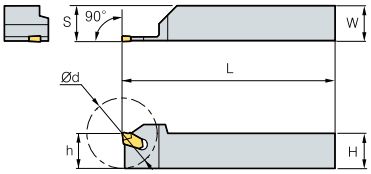


Fig. 1

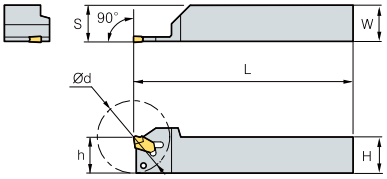
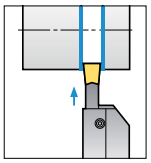


Fig. 2



R type insert

(inch)

Designation		H=(h)	W	L	Ød	S	Inserts	Wrench		Fig.
SPHA	062-3	5/8	5/8	4	1.260	0.637	SP300, 300R/L	SW50L	-	1
	075-3	3/4	3/4	4 3/4	1.575	0.762	SP300, 300R/L			
	075-4	3/4	3/4	4 3/4	1.969	0.766	SP400, 400R/L			
	075-5	3/4	3/4	4 3/4	2.362	0.770	SP500, 500R/L			
	100-3	1	1	6	1.969	1.012	SP300, 300R/L			
	100-4	1	1	6	2.362	1.016	SP400, 400R/L			
	100-5	1	1	6	2.756	1.020	SP500, 500R/L			
SPHA-S	062-S-3	5/8	5/8	4	1.260	0.637	SP300, 300R/L			
	075-S-3	3/4	3/4	4 3/4	1.575	0.726	SP300, 300R/L			
	075-S-4	3/4	3/4	4 3/4	1.969	0.766	SP400, 400R/L			
	075-S-5	3/4	3/4	4 3/4	2.326	0.770	SP500, 500R/L	-	SW15S	2
	100-S-3	1	1	6	1.969	1.012	SP300, 300R/L			
	100-S-4	1	1	6	2.362	1.016	SP400, 400R/L			
	100-S-5	1	1	6	2.756	1.020	SP500, 500R/L			

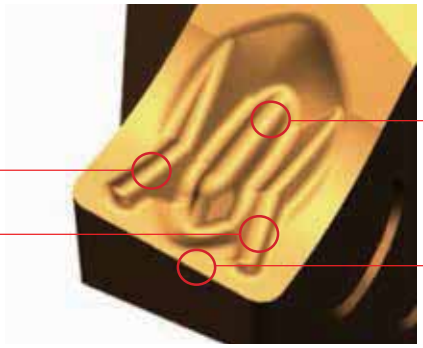
Applicable inserts **C41**

Economical 3-corner insert for high precision grooving

TB-M/TB

- Economical 3-corner insert for grooving
- Various cutting edge size ranging from 0.049~0.177inch
- High accuracy ground insert ensures high precision machining
- Stable chip control optimized for automated grooving process

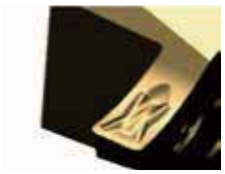
Features of TB-M chip breaker



- Smooth chip evacuation due to narrow chip curls
- Excellent chip control for turning and chamfering
- Stable chip flow at high feed

- Stable chip curl control at high feed

- Sharp cutting edge for better cutting action
- Excellent chipping resistance due to stronger cutting edges
- Improved surface roughness of workpieces

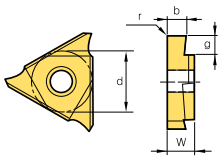
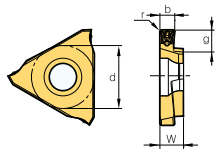
Chip breaker types per size			
TB4150R-M ~ TB4185R-M	**TB4200R-M ~ TB4228R-M**	**TB4300R-M ~ TB4350R-M**	**TB4400R-M ~ TB4450R-M**
			
Cutting edge width b 0.059 ~ 0.073inch	Cutting edge width b 0.079 ~ 0.110inch	Cutting edge width b 0.118 ~ 0.138inch	Cutting edge width b 0.157 ~ 0.177inch

Recommended cutting conditions

(inch)

ISO	Grade	Cutting speed, vc (sfm)		Feed, fn (ipr)	
		CN2000	**PC5300**	**CN2000**	**PC5300**
P	SMOOC	490(320~720)	420(260~590)	0.002~0.008	0.002~0.008
P	SCM	490(320~650)	420(260~590)	0.002~0.008	0.002~0.008
M	STS	-	260(130~490)	-	0.002~0.005
K	GC, GCD	-	420(260~590)	-	0.002~0.006

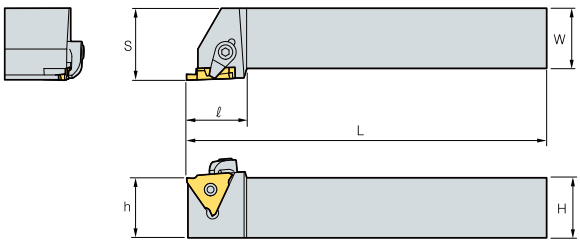
Insert

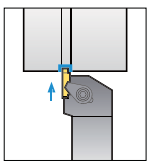
Application	Picture	Designation		Cermet		Coated					Un-coated	Dimensions (inch)					Configuration
				CN2000	CN20	NC3010	NC3120	NC3220	PC8110	PC5300	ST20	b	g	W	r	d	
Narrow grooving		TB	3125R/L									0.049	0.059	3/16	1/128	3/8	
			3145R/L									0.057	0.059	3/16	1/128	3/8	
			3175R/L									0.069	0.098	3/16	1/128	3/8	
			3185R/L									0.073	0.098	3/16	1/128	3/8	
			3200R/L									0.079	0.098	3/16	1/128	3/8	
			3230R/L									0.091	0.138	3/16	0.012	3/8	
			3280R/L									0.110	0.138	3/16	0.012	3/8	
			3330R/L									0.130	0.138	3/16	0.012	3/8	
			3430R/L									0.169	0.138	3/16	1/64	3/8	
			4125R/L	●	●							0.049	0.079	3/16	1/128	1/2	
			4145R/L	●	●							0.057	0.079	3/16	1/128	1/2	
			4150R/L	●	●							0.059	0.138	3/16	1/128	1/2	
			4175R/L	●	●							0.069	0.138	3/16	1/128	1/2	
			4185R/L	●	●							0.073	0.138	3/16	1/128	1/2	
			4200R/L	●	●							0.079	0.138	3/16	1/128	1/2	
			4215R/L									0.085	0.138	3/16	1/128	1/2	
			4230R/L	●	●							0.091	0.138	3/16	1/128	1/2	
			4250R/L	●	●							0.098	0.157	3/16	0.012	1/2	
			4265R/L									0.104	0.157	3/16	0.012	1/2	
			4280R/L		●							0.110	0.157	3/16	0.012	1/2	
			4300R/L	●	●							0.118	0.157	3/16	0.012	1/2	
			4330R/L	●	●							0.130	0.157	3/16	0.012	1/2	
			4350R/L									0.138	0.197	3/16	0.012	1/2	**Feature of TB-M** • Suitable for automated line with Chip breaker • Superior surface
			4400R/L									0.157	0.197	3/16	1/64	1/2	
			4430R/L	●								0.169	0.197	3/16	1/64	1/2	
			4450R/L									0.177	0.197	3/16	1/64	1/2	
		TB	4150R-M							●		0.059	0.138	3/16	1/128	1/2	
			4175R-M							●		0.069	0.138	3/16	1/128	1/2	
			4185R-M							●		0.073	0.138	3/16	1/128	1/2	
			4200R-M							●		0.079	0.138	3/16	1/128	1/2	
			4215R-M							●		0.085	0.138	3/16	1/128	1/2	
			4230R-M							●		0.091	0.138	3/16	1/128	1/2	
			4250R-M							●		0.098	0.157	3/16	0.012	1/2	
			4265R-M							●		0.104	0.157	3/16	0.012	1/2	
			4280R-M							●		0.110	0.157	3/16	0.012	1/2	
			4300R-M							●		0.118	0.157	3/16	0.012	1/2	
			4330R-M							●		0.130	0.157	3/16	0.012	1/2	
			4350R-M							●		0.138	0.197	3/16	0.012	1/2	
			4400R-M							●		0.157	0.197	3/16	1/64	1/2	
			4430R-M							●		0.169	0.197	3/16	1/64	1/2	
			4450R-M							●		0.177	0.197	3/16	1/64	1/2	

● : Stock item

TBH For Narrow grooving

TB





R type insert

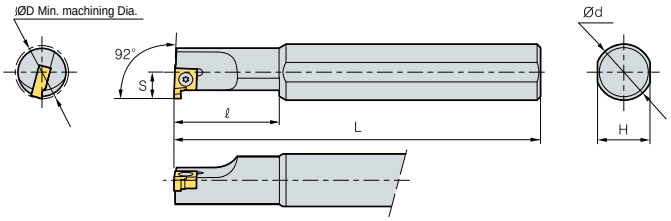
(inch)

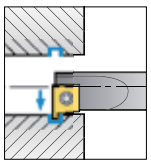
Designation		H=(h)	W	L	ℓ	S	Inserts	Clamp	Clamp Screw	Wrench
TBH	12-3-23	3/4	3/4	5	1.004	0.947	TB3125-3230	CS6R1	DHA0617	HW30L
	12-3-33	3/4	3/4	5	1.004	0.947	TB3280-3330			
	12-3-43	3/4	3/4	5	1.004	0.947	TB3430			
	16-3-23	1	1	6	1.004	1.197	TB3125-3230			
	16-3-33	1	1	6	1.004	1.197	TB3280-3330			
	16-3-43	1	1	6	1.004	1.197	TB3430			
	12-4-23	3/4	3/4	5	1.004	0.947	TB4125-4230			
	12-4-33	3/4	3/4	5	1.004	0.947	TB4250-4330			
	12-4-45	3/4	3/4	5	1.004	0.947	TB4350-4450			
	16-4-23	1	1	6	1.004	1.197	TB4125-4230			
	16-4-33	1	1	6	1.004	1.197	TB4250-4330			
	16-4-45	1	1	6	1.004	1.197	TB4350-4450			

Applicable inserts **C45**

IGH For Internal grooving

IG





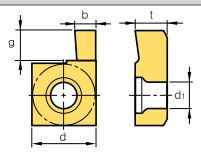
R type insert

(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Screw	Wrench
IGH	0910-2	9/16	5/8	0.585	6	0.984	0.260	IG125~280	FTKA02565	TW07P
	1110-2	11/16	5/8	0.585	6	1.181	0.299			
	1310-2	3/4	3/4	0.710	8	1.575	0.378			

Applicable inserts **C46**

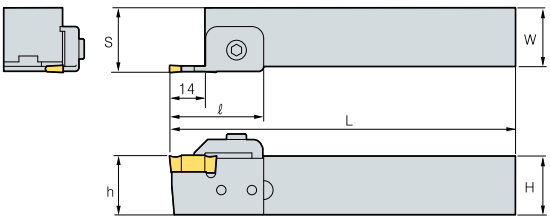
Insert

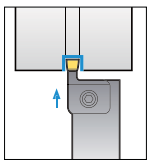
Application	Picture	Designation		Coated			Uncoated			Dimensions (inch)					Configuration
				NC3010	NC3120	NC3220	H01	G10	ST30A	b	g	t	d	d_1	
Internal grooving		IG	125						●	0.049	0.059	1/8	1/4	0.110	
			145						●	0.048	0.059	1/8	1/4	0.110	
			175						●	0.069	0.059	1/8	1/4	0.110	
			200						●	0.079	0.091	1/8	1/4	0.110	
			230						●	0.091	0.091	1/8	1/4	0.110	
			280						●	0.110	0.091	1/8	1/4	0.110	

● : Stock item

DBH For Deep and Wide grooving

DB DC





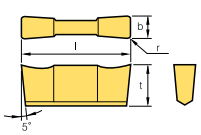
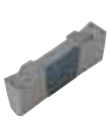
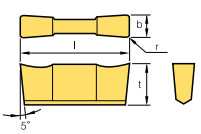
R type insert

(inch)

Designation		H=(h)	W	L	ℓ	S		Inserts		Clamp	Clamp Screw	Screw	Locator	Wrench
						*	**	*	**					
DBH	12R/L-3	3/4	3/4	6	1.575	0.841	0.860	DB300 DC300	DB400 DC400	CGH5R1	MHA0512	MHB0410	LD34	HW30L HW40L
	16R/L-3	1	1	6	1.575	1.091	1.110							
	12R/L-5	3/4	3/4	6	1.575	0.900	0.919	DB500 DC500	DB600	CGH5R2	MHA0512	MHB0410	LD56	HW30L HW40L
	16R/L-5	1	1	6	1.575	1.150	1.169							
	12R/L-7	3/4	3/4	6	1.575	0.978	0.998	DB700	DB800	CGH5R3	MHA0512	MHB0410	LD78	HW30L HW40L
	16R/L-7	1	1	6	1.575	1.228	1.248							

Applicable inserts **C46**

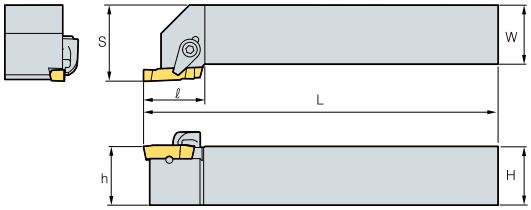
Insert

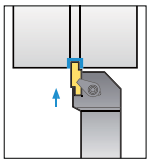
Application	Picture	Designation		Cermet	Coated			Uncoated		Dimensions (inch)				Configuration
				CN20	NC3010	NC3120	NC3220	H01	G10	b	l	t	r	
Grooving		DB	300	●						0.118	0.787	0.295	0.008	
			400	●						0.157	0.787	0.295	0.008	
			500	●						0.197	0.787	0.295	0.008	
			600							0.236	0.787	0.295	0.008	
			700							0.276	0.787	0.295	0.008	
			800							0.315	0.787	0.295	0.008	
		DC	300	●						0.118	0.787	0.295	0.008	
			400	●						0.157	0.787	0.295	0.010	
			500							0.197	0.787	0.295	0.012	

● : Stock item

GFT For External grooving

GW BF





R type insert

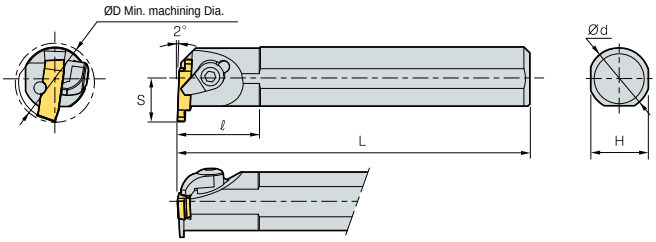
(inch)

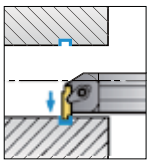
Designation		H=(h)	W	L	ℓ	S	Inserts	Clamp	Screw	Pin	Wrench
GFT	12R/L-3	1	1	5	0.925	1.197	GW110~300R/L,BF3	CS5R1	DHA0514	PN0310	HW25L
	16R/L-3	1	1	6	0.925	1.276					
	16R/L-5	1	1	6	1.004	1.276	GW315~500R/L,BF5	CS6R1	DHA0617	PN0310	HW30L
	16R/L-8	1	1	6	1.122	1.276	GW600~800R/L,BF8	CS8R1	DHA0820	PN0314	HW40L

Applicable inserts **C47** • Use right-hand insert for left-hand holder

GFIP For Internal grooving

BF GW





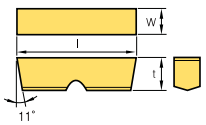
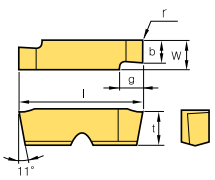
R type insert

(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIP	1310-3	13/16	5/8	0.585	6	0.669	0.433	GW110~300R/L,BF3	CH5R2	CR04	CHX0513	PN0310	HW25L
	1712-3	1 1/16	3/4	0.670	6	0.866	0.531						
	2116-3	1 5/16	1	0.920	8	0.866	0.669		CH6R2	CR05	CHX0616	PN0310	HW30L
	3224-3	2	1 1/2	1.380	12	1.260	1.063						
	2116-5	1 5/16	1	0.920	8	0.866	0.669	GW315~500R/L,BF5					
	3224-5	2	1 1/2	1.380	12	1.260	1.063						
	3224-8	2	1 1/2	1.380	12	1.260	1.063	GW600~800R/L,BF8	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts **C47** • Use right-hand insert for left-hand holder

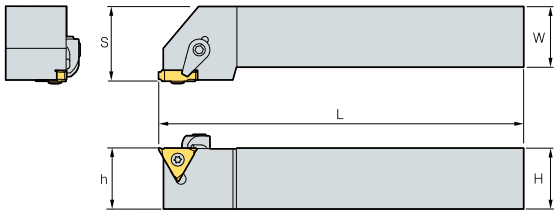
Insert

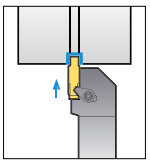
Application	Picture	Designation		Uncoated ST30A		Dimensions (inch) b	g	W	l	t	r	Configuration
Blank		BF	-3	●		-	-	0.122	0.646	0.207	-	
			-5			-	-	0.201	0.882	0.246	-	
			-8			-	-	0.319	1.079	0.286	-	
				R	L							
Grooving		GW	110R/L	●	●	0.043	0.083	0.122	0.630	0.197	1/128	
			130R/L	●	●	0.051	0.091	0.122	0.630	0.197	1/128	
			160R/L	●	●	0.063	0.102	0.122	0.630	0.197	1/128	
			185R/L	●	●	0.073	0.114	0.122	0.630	0.197	1/128	
			215R/L	●	●	0.073	0.114	0.122	0.630	0.197	1/128	
			265R/L	●	●	0.104	0.146	0.122	0.630	0.197	1/128	
			300R/L	●	●	0.118	0.157	0.122	0.630	0.197	1/128	
			315R/L	●	●	0.124	0.165	0.201	0.866	0.236	0.012	
			415R/L	●	●	0.124	0.165	0.201	0.866	0.236	0.012	
			500R/L	●	●	0.197	0.236	0.201	0.866	0.236	0.012	
			600R/L			0.236	0.276	0.319	1.063	0.276	0.012	
			800R/L			0.315	0.354	0.319	1.063	0.276	0.012	

● : Stock item

GH For O-ring grooving Snap-ring grooving

GO GS



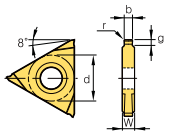
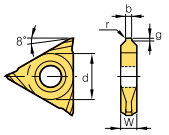


R type insert
(inch)

Designation		H=(h)	W	L	S	Inserts	Clamp	Clamp Screw	Screw	Wrench
GH	12-3	3/4	3/4	5	0.829	GS 125~280	CS6R1	DHA0617	PTMA03508	TW09P-HW30L
	16-3	1	1	6	1.079	GO 250				
	12-4	3/4	3/4	5	0.789	GS 330 / 430				
	16-4	1	1	6	1.039	GO 320 / 410				

Applicable inserts C48

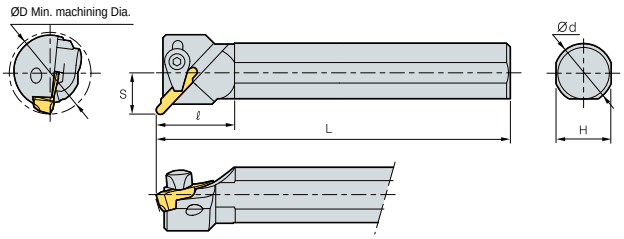
Insert

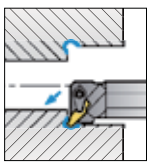
Application	Picture	Designation		Coated NC3010	Coated NC3120	Coated NC3220	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	r	d	Configuration
Grooving(Narrow · O-ring · Snap-ring)		GO	250							0.098	0.059	0.130	0.014	3/8	
			320							0.126	0.079	0.150	0.014	3/8	
			410							0.161	0.098	0.177	0.026	3/8	
		GS	125					●		0.048	0.059	0.098	1/128	3/8	
			145					●		0.056	0.059	0.098	1/128	3/8	
			175					●		0.068	0.079	0.098	1/128	3/8	
			185					●		0.072	0.079	0.098	1/128	3/8	
			200					●		0.080	0.098	0.098	1/128	3/8	
			230					●		0.090	0.138	0.110	1/128	3/8	
			280					●		0.109	0.138	0.130	0.012	3/8	
			330					●		0.129	0.157	0.150	0.012	3/8	
			430					●		0.169	0.157	0.177	1/64	3/8	

● : Stock item

GFIK For Reliefing

GR



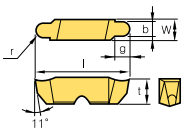


R type insert
(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIK	1410-3	7/8	5/8	0.585	6	0.846	0.433	GR3□□	CH5R2	CR04	CHX0513	PN0310	HW25L
	2116-3	1 5/16	1	0.920	8	0.846	0.669		CH5R2	CR04	CHX0513	PN0310	HW25L
	3224-3	2	1 1/2	1.380	12	1.394	1.063		CS5R1	-	DHA0514	PN0310	HW25L
	2116-5	1 5/16	1	0.920	8	1.083	0.669	GR5□□	CS6R1	-	DHA0617	PN0314	HW30L
	3224-5	2	1 1/2	1.380	12	1.555	1.063						
	3224-8	2	1 1/2	1.380	12	1.646	1.063	GR8□□	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts C48

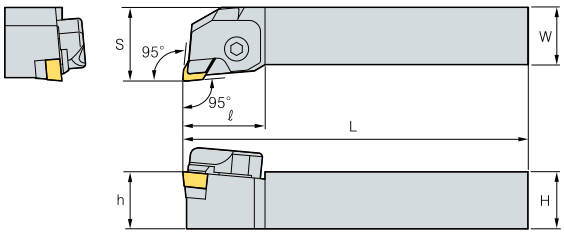
Insert

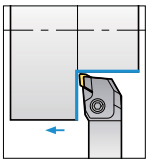
Application	Picture	Designation		Coated NC3010	Coated NC3120	Coated NC3220	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	l	t	r	Configuration
Reliefing		GR	310R							0.079	0.079	0.122	0.626	0.197	0.039	
			315R							0.118	0.114	0.122	0.626	0.197	0.059	
			520R							0.157	0.157	0.201	0.862	0.236	0.079	
			525R							0.197	0.197	0.201	0.858	0.236	0.098	
			830R							0.236	0.236	0.319	1.055	0.276	0.118	
			840R							0.315	0.315	0.319	1.051	0.276	0.157	

● : Stock item

EH Regrinding type insert

ESB





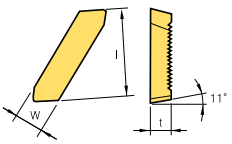
R type insert

(inch)

Designation		H=(h)	W	L	ℓ	S	Inserts	Clamp	Clamp Screw	Chip Breaker	Shim	Shim Screw	Wrench
EH	620R	3/4	3/4	5	1.420	1.060	ESB34	CTH6R2	BHA0616	CB20	SES33C	SHX0310	HW50L HW20L
	625R	1	1	6	1.420	1.250							

Applicable inserts **C49**

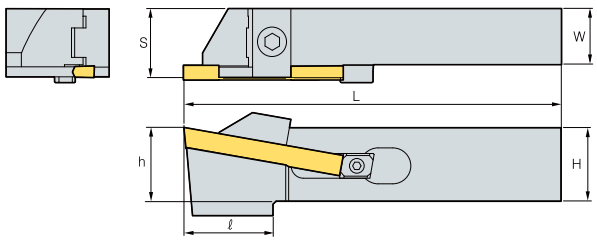
Insert

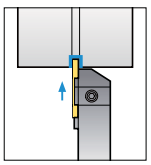
Application	Picture	Designation		Uncoated		Dimensions (inch)			Configuration
				ST10	ST20	W	l	t	
General Machining		ESB	34			3/8	1.181	1/4	

● : Stock item

PH For Parting off Deep grooving

POB





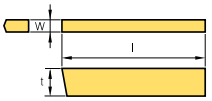
R type insert

(inch)

Designation		H	W	L	ℓ	S	h	Max (Ø)	Inserts	Clamp	Clamp Screw	Stopper	Stopper Screw	Wrench
PH	12-3R	3/4	3/4	6	1.339	0.890	3/4	1.181	POB300	CGH6R1	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-3R	1	3/4	6	1.339	0.890	1	1.575						
	12-4R	3/4	3/4	6	1.339	0.927	3/4	1.181	POB400	CGH6R2	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-4R	1	3/4	6	1.339	0.927	1	1.575						
	12-5R	3/4	3/4	6	1.339	0.963	3/4	1.969	POB500	CTH 6R3	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-5R	1	3/4	6	1.339	0.963	1	1.969						

Applicable inserts **C49**

Insert

Application	Picture	Designation		Uncoated		Dimensions (inch)			Configuration
				ST10	ST20	W	l	t	
Grooving · Parting off		POB	300		●	0.188	2.165	0.236	
			400		●	5/32	2.165	0.276	
			500		●	0.197	2.165	0.315	

● : Stock item

Six kinds of inserts can be used in one holder for various operations

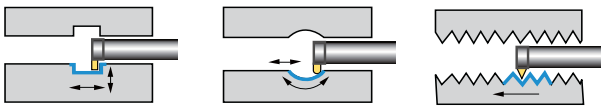
New Fine Tools

- Strong clamping system and specially designed insert are suitable for small diameter machining.
- Six kinds of inserts can be clamped in one holder for various operations
- Guaranteed long tool life due to good toughness substrate with new TiAlN
- High accuracy ground insert ensures high precision machining

Application range

▶ Internal grooving, Profiling, Threading and Boring at Ø0.315inch~Ø0.630inch

Features



(Grooving, Turning) (Forming) (Threading)

Application examples

NFTIHA 31 50 C - 2

- 31 — Minimum Diameter
- 50 — Overhang (ℓ /ØD)
- C — Shank Type (S : Steel, C : Carbide)
- 2 — Shank Dia.

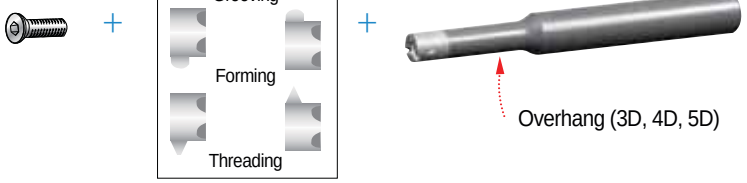
Recommended cutting condition

Workpiece	Grade	Cutting Condition				
		Min. machining Dia.				
	PC130		Ø5/16	Ø7/16	Ø35/64	Ø5/8
Carbon steel	◎	vc(sfm)	100~260	100~330	99~330	100~330
		fn(ipr)	0.0004~0.0016	0.0004~0.0020	0.0008~0.0020	0.0008~0.0024
Alloy steel	◎	vc(sfm)	100~260	100~330	100~330	100~330
		fn(ipr)	0.0004~0.0008	0.0004~0.0016	0.0008~0.0016	0.0008~0.0020
Cast iron	○	vc(sfm)	100~260	100~330	100~330	100~330
		fn(ipr)	0.0004~0.0020	0.0004~0.0020	0.0008~0.0020	0.0008~0.0020
Non-ferrous alloy	○	vc(sfm)	230~490	330~490	330~490	330~490
		fn(ipr)	0.0008~0.0024	0.0008~0.0024	0.0008~0.0024	0.0008~0.0024

Note
- In case of chattering, reduce the cutting speed and feed
- To find the optimal cutting conditions, advise to gradually increase from the lowest cutting condition of the above recommendation
- In case of the unilateral grooving depth over 0.039inch, work to the step feed rate

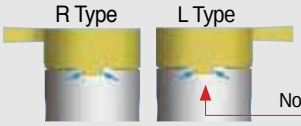
Clamping system

Screw	Insert	Holder



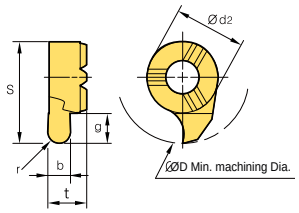
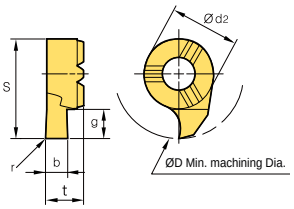
• Available R/L type insert with one holder

Stable clamping according to the tripod structure



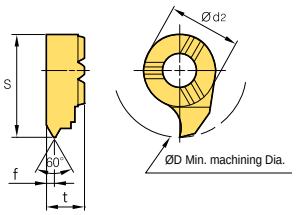
No-Spin-System design for strong clamping

Insert

Application	Picture	Designation		Coated PC130 R	Coated PC130 L	ØD	b	r	S	g	Ød2	t	Pitch	f	Configuration
Profiling		NFTF	08082R/L	●		5/16	0.032	0.016	0.031	0.051	0.236	0.152	-		
			08122R/L	●		5/16	0.048	0.024	0.031	0.051	0.236	0.152	-		
			08182R/L	●		5/16	0.072	0.036	0.031	0.051	0.236	0.152	-		
			11082R/L	●		7/16	0.032	0.016	0.421	0.102	0.315	0.193	-		
			11122R/L			7/16	0.048	0.024	0.421	0.102	0.315	0.193	-		
			11182R/L			7/16	0.072	0.036	0.421	0.102	0.315	0.193	-		
			11202R/L	●		7/16	0.080	0.040	0.421	0.102	0.315	0.193	-		
			11302R/L	●		7/16	0.119	0.059	0.421	0.102	0.315	0.193	-		
			14122R/L	●		35/64	0.048	0.024	0.531	0.169	0.354	0.230	-		
			14182R/L	●		35/64	0.072	0.036	0.531	0.169	0.354	0.230	-		
			14202R/L	●		35/64	0.080	0.040	0.531	0.169	0.354	0.230	-		
			14222R/L			35/64	0.087	0.044	0.531	0.169	0.354	0.230	-		
			14302R/L			35/64	0.119	0.059	0.531	0.169	0.354	0.230	-		
			16182R/L	●		5/8	0.072	0.036	0.618	0.181	0.433	0.228	-		
			16222R/L	●		5/8	0.087	0.044	0.618	0.181	0.433	0.228	-		
			16302R/L	●		5/8	0.119	0.059	0.618	0.181	0.433	0.228	-		
			16402R/L	●		5/8	0.158	0.079	0.618	0.181	0.433	0.228	-		
Grooving		NFTG	08075R/L	●		5/16	0.030	-	0.305	0.051	0.232	0.152	-	-	
			08085R/L	●		5/16	0.033	-	0.305	0.051	0.232	0.152	-	-	
			08095R/L	●		5/16	0.037	-	0.305	0.051	0.232	0.152	-	-	
			08121R/L	●		5/16	0.048	-	0.305	0.051	0.232	0.152	-	-	
			08141R/L	●		5/16	0.056	-	0.305	0.051	0.232	0.152	-	-	
			08152R/L	●		5/16	0.060	-	0.305	0.051	0.232	0.152	-	-	
			08171R/L	●		5/16	0.067	-	0.305	0.051	0.232	0.152	-	-	
			08202R/L	●		5/16	0.080	-	0.305	0.051	0.232	0.152	-	-	
			11075R/L	●		7/16	0.030	1/128	0.421	0.071	0.315	0.193	-	-	
			11085R/L	●		7/16	0.033	1/128	0.421	0.071	0.315	0.193	-	-	
			11095R/L	●		7/16	0.037	1/128	0.421	0.071	0.315	0.193	-	-	
			11121R/L	●		7/16	0.048	1/128	0.421	0.102	0.315	0.193	-	-	
			11141R/L	●		7/16	0.056	1/128	0.421	0.102	0.315	0.193	-	-	
			11152 R/L	●		7/16	0.060	1/128	0.421	0.102	0.315	0.193	-	-	
			11171R/L	●		7/16	0.067	1/128	0.421	0.102	0.315	0.193	-	-	
			11202R/L	●		7/16	0.080	1/128	0.421	0.102	0.315	0.193	-	-	
			11202R-02/L	●		7/16	0.080	1/128	0.421	0.102	0.315	0.193	-	-	
			11252R/L	●		7/16	0.099	1/128	0.421	0.102	0.315	0.193	-	-	
			11302R/L	●		7/16	0.119	1/128	0.421	0.102	0.315	0.193	-	-	
			14075R/L			35/64	0.030	-	0.531	0.071	0.354	0.230	-	-	
			14085R/L	●		35/64	0.033	-	0.531	0.071	0.354	0.230	-	-	
			14095R/L	●		35/64	0.037	-	0.531	0.071	0.354	0.230	-	-	
			14121R/L	●		35/64	0.048	-	0.531	0.169	0.354	0.230	-	-	
			14141R/L	●		35/64	0.056	-	0.531	0.169	0.354	0.230	-	-	
			14152R/L	●		35/64	0.060	-	0.531	0.169	0.354	0.230	-	-	
			14171R/L	●		35/64	0.067	-	0.531	0.169	0.354	0.230	-	-	
			14202R/L	●		35/64	0.080	-	0.531	0.169	0.354	0.230	-	-	
			14252R/L	●		35/64	0.099	-	0.531	0.169	0.354	0.230	-	-	
			14302R/L	●		35/64	0.119	-	0.531	0.169	0.354	0.230	-	-	
			16075R/L			5/8	0.030	-	0.618	0.071	0.433	0.228	-	-	
			16085R/L			5/8	0.033		0.618	0.071	0.433	0.228	-	-	
			16095R/L	●		5/8	0.037	-	0.618	0.071	0.433	0.228	-	-	
			16121R/L	●		5/8	0.048	-	0.618	0.181	0.433	0.228	-	-	
			16141R/L	●		5/8	0.056	-	0.618	0.181	0.433	0.228	-	-	
			16171R/L	●		5/8	0.067	-	0.618	0.181	0.433	0.228	-	-	
			16202R/L	●		5/8	0.080	-	0.618	0.181	0.433	0.228	-	-	
			16252R/L	●		5/8	0.099	-	0.618	0.181	0.433	0.228	-	-	
			16302R/L	●		5/8	0.119	-	0.618	0.181	0.433	0.228	-	-	
			16352R/L	●		5/8	0.139	-	0.618	0.181	0.433	0.228	-	-	
			16402R/L	●		5/8	0.158	-	0.618	0.181	0.433	0.228	-	-	

● : Stock item

Insert

Application	Picture	Designation		Coated PC130 R	Coated PC130 L	ØD	b	r	S	g	Ød2	t	Pitch (mm)	f	Configuration
Threading		NFTT	0805MR/L	●		5/16	-	-	0.305	-	0.236	0.152	0.5	0.039	
			0810MR/L	●		5/16	-	-	0.305	-	0.236	0.152	1.0	0.039	
			0815MR/L	●		5/16	-	-	0.305	-	0.236	0.152	1.5	0.047	
			1110MR/L	●		7/16	-	-	0.421	-	0.315	0.193	1.0	0.047	
			1115MR/L	●		7/16	-	-	0.421	-	0.315	0.193	1.5	0.047	
			1120MR/L	●		7/16	-	-	0.421	-	0.315	0.193	2.0	0.047	
			1125MR/L	●		7/16	-	-	0.421	-	0.315	0.193	2.5	0.047	
			1410MR/L	●		35/64	-	-	0.531	-	0.354	0.230	1.0	0.047	
			1415MR/L	●		35/64	-	-	0.531	-	0.354	0.230	1.5	0.047	
			1420MR/L			35/64	-	-	0.531	-	0.354	0.230	2.0	0.047	
			1425MR/L	●		35/64	-	-	0.531	-	0.354	0.230	2.5	0.047	
			1610MR/L			5/8	-	-	0.618	-	0.433	0.228	1.0	0.047	
			1615MR/L			5/8	-	-	0.618	-	0.433	0.228	1.5	0.047	
			1620MR/L	●		5/8	-	-	0.618	-	0.433	0.228	2.0	0.047	
			1625MR/L			5/8	-	-	0.618	-	0.433	0.228	2.5	0.047	
			1630MR/L			5/8	-	-	0.618	-	0.433	0.228	3.0	0.059	
			1635MR/L			5/8	-	-	0.618	-	0.433	0.228	3.5	0.063	
			1640MR/L			5/8	-	-	0.618	-	0.433	0.228	4.0	0.071	

● : Stock item

NFTIH

NFTF
NFTT
NFTG

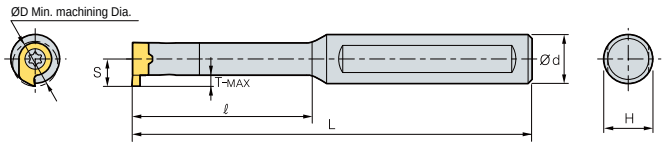


Fig. 1

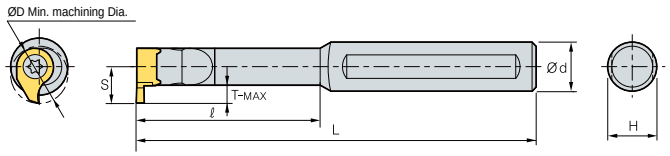


Fig. 2

• For NFTIH55 type holder

R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts NFTG : Grooving NFTT : Threading NFTF : Forming	Screw	Wrench	Fig.
NFTIHA	3125C-2	5/16	1/4	2.559	-	0.0394	0.157	0.189	NFTG08□□□R/L NFTT08□□□R/L NFTF08□□□R/L	PTKA02508	TW08P	1
	3150C-2	5/16	1/2	2.756	0.610	0.0394	0.394	0.189				
	3150C-3	5/16	1/2	3.150	0.945	0.0394	0.394	0.189				
	3150S-3	5/16	1/2	3.150	0.945	0.0394	0.394	0.189				
	3150C-4	5/16	1/2	3.453	1.260	0.0394	0.394	0.189				
	3150C-5	5/16	1/2	3.947	1.575	0.0394	0.394	0.189				
	4330C-2	7/16	5/16	3.150	-	0.0906	0.276	0.264	NFTG11□□□R/L NFTT11□□□R/L NFTF11□□□R/L	PTKA03510	TW15P	2
	4350C-2	7/16	1/2	2.953	0.787	0.0906	0.433	0.264				
	4350C-3	7/16	1/2	3.740	1.299	0.0906	0.433	0.264				
	4350S-3	7/16	1/2	3.740	1.299	0.0906	0.433	0.264				
	4350C-4	7/16	1/2	4.331	1.732	0.0906	0.433	0.264				
	4350C-5	7/16	1/2	4.724	2.165	0.0906	0.433	0.264				
	5550C-0	35/64	1/2	2.953	0.787	0.1575	0.433	0.354	NFTG14□□□R/L NFTT14□□□R/L NFTF14□□□R/L	PTKA0412	TW15P	2
	5562C-0	35/64	5/8	2.953	0.787	0.1575	0.591	0.354				
	5550C-1	35/64	1/2	3.937	1.339	0.1575	0.433	0.354				
	5562C-1	35/64	5/8	3.937	1.339	0.1575	0.591	0.354				
	5550C-2	35/64	1/2	4.331	1.772	0.1575	0.433	0.354				
	5562C-2	35/64	5/8	4.331	1.772	0.1575	0.591	0.354				
	5550C-3	35/64	1/2	5.118	2.520	0.1575	0.433	0.354				
	5562C-3	35/64	5/8	5.118	2.520	0.1575	0.591	0.354				
	6350C-3	5/8	1/2	5.118	1.890	0.1693	0.433	0.402	NFTG16□□□R/L NFTT16□□□R/L NFTF16□□□R/L	PTKA0512	TW20P	2
	6350S-3	5/8	1/2	5.118	1.890	0.1693	0.433	0.402				
	6350C-4	5/8	1/2	5.118	2.520	0.1693	0.433	0.402				
	6350C-5	5/8	1/2	5.906	3.150	0.1693	0.433	0.402				
	6362C-3	5/8	5/8	5.118	1.890	0.1693	0.591	0.402				
	6362C-4	5/8	5/8	5.118	2.520	0.1693	0.591	0.402				
	6362C-5	5/8	5/8	5.906	3.150	0.1693	0.591	0.402				

Applicable inserts **C51, C52**

Multi Turn

Holder code system

MT 20 R - 2.25D

- MT — Brand Name
- 20 — Tool Dia.
- R — Hand
- 2.25D — Aspect ratio

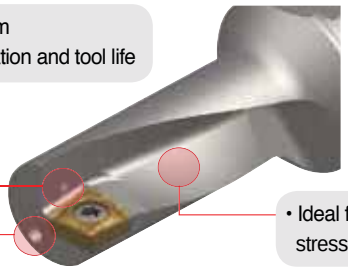
Insert code system

Q C M T 08 03 04 - CM

- Q — Insert shape
- C — Relief angle
- M — Tolerance
- T — Cross Section Type
- 08 — Cutting Edge Length
- 03 — Height of Cutting Edge
- 04 — Nose Radius
- CM — Chip Breaker

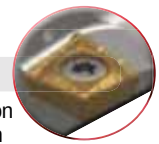
Tool design by FEM analysis

- Double coolant system
- Excellent chip evacuation and tool life

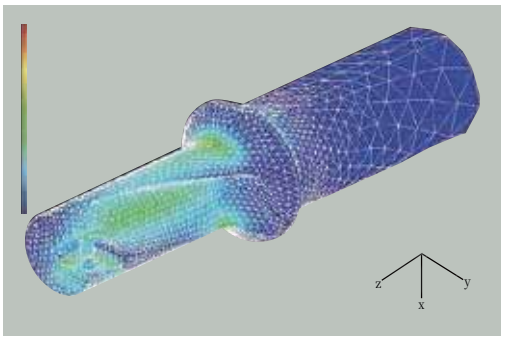


- Ideal flute design minimizing stress concentrations

※ Clamping tip



Correct : High cutting edge position
Wrong : Low cutting edge position



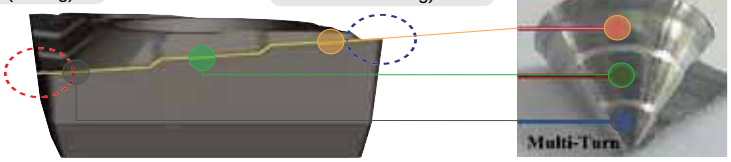
- Minimized stress during cutting, prevented damage from vibration and longer tool life

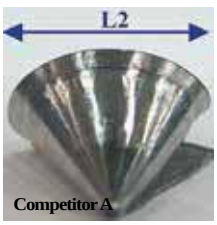
Optimized design

Creative stepping cutting edge

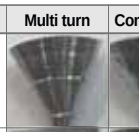
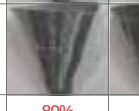
Drilling edge (Drilling)

Turning edge (Internal, external and face turning)





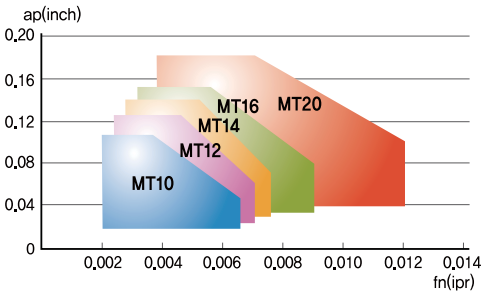
- Special chip formed by edge geometry Better chip
- evacuation due to small radius width of chip curl

Comparison	Multi turn	Competitor A	Competitor B
Feed fn(ipr) = 0.003			
Feed fn(ipr) = 0.004			
Chip width (rate)	80%	100%	120%

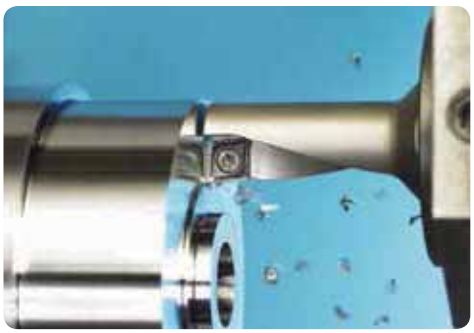
User's guide

External / Internal turning

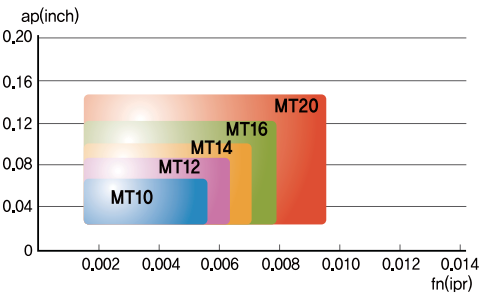
● Application range



Facing

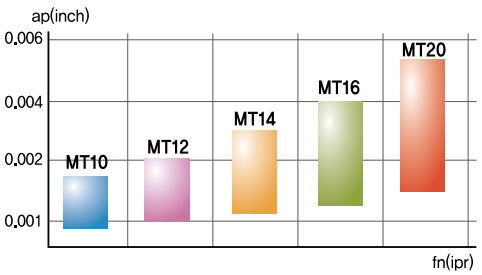


● Appication ranges of facing



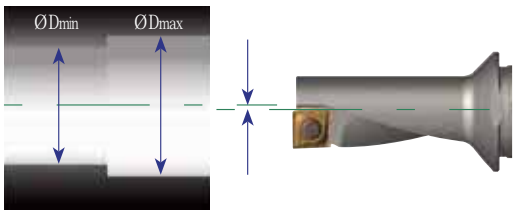
Drilling

● Drilling feed range by designation



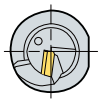
Offset (Diameter compensation)

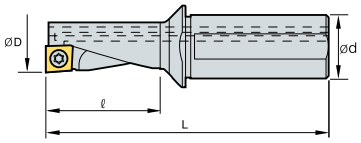
Disignation	Machined diameter(inch)	ØDmin(inch)	ØDmax(inch)
MT10R/L-2.25D	0.394	0.388	0.407
MT12R/L-2.25D	0.472	0.467	0.486
MT14R/L-2.25D	0.551	0.545	0.565
MT16R/L-2.25D	0.630	0.624	0.644
MT20R/L-2.25D	0.787	0.781	0.801
MT25R/L-2.25D	0.984	0.978	0.998
MT32R/L-2.25D	1.260	1.254	1.274



Drill diameter is adjustable by the offset compensation

MT (Multi-Turn)



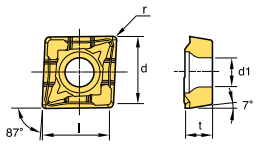
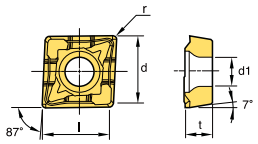


(inch)

Designation	ØD	Ød	ℓ	L	Inserts	Screw	Wrench
MT10R/L-2.25D	0.394	0.472	0.886	2.736	QC□T050204	FTNA0204S	TW06P
MT12R/L-2.25D	0.472	0.630	1.063	3.071	QC□T060204	FTNA02205S	TW06P
MT14R/L-2.25D	0.551	0.630	1.240	3.287	QC□T070304	FTKA02555	TW07P
MT16R/L-2.25D	0.630	0.787	1.417	3.701	QC□T080304	FTNA0306	TW09P
MT20R/L-2.25D	0.787	0.984	1.772	4.370	QC□T10T304	FTNA03508	TW15P
MT25R/L-2.25D	0.984	1.260	2.224	5.118	QC□T130408	FTNC04509	TW20S
MT32R/L-2.25D	1.260	1.575	2.835	6.229	QC□T170508	FTNC04511	TW20S

Applicable inserts **C55**

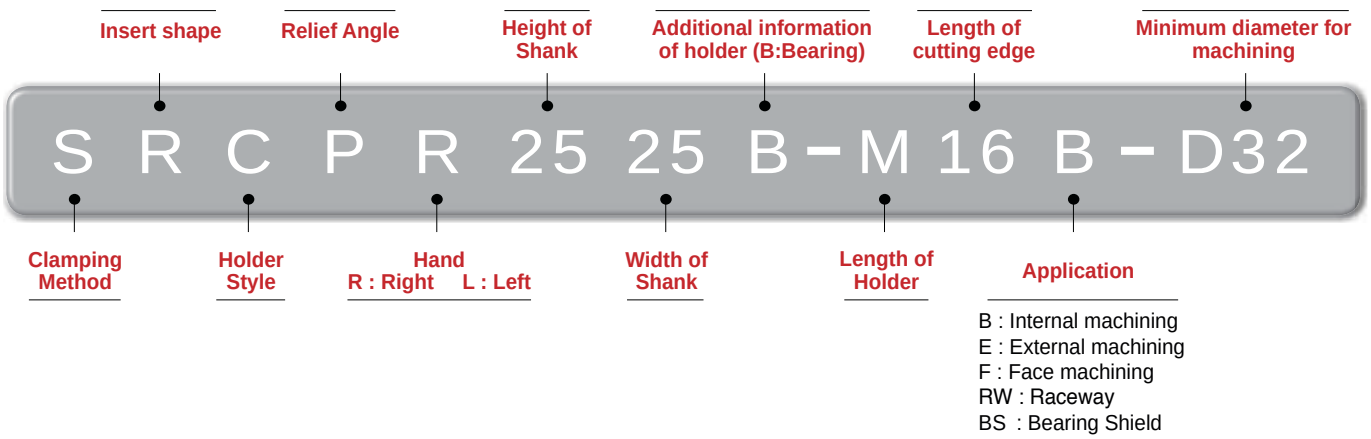
Insert

Picture	Designation		Coated				Uncoated	Dimensions (inch)					Configuration
			PC5300	NC3120	NC3220	NC6210	H01	l	d	t	r	Ød1	
	QCMT	050204-CM	●		●			0.197	0.213	0.038	0.016	0.091	
		060204-CM	●		●			0.236	0.252	0.094	0.016	0.098	
		070304-CM	●		●	●		0.276	0.291	0.125	0.016	0.110	
		080304-CM	●		●	●		0.315	0.331	0.125	0.016	0.134	
		10T304-CM	●		●	●		0.394	0.409	0.156	0.016	0.157	
		130408-CM	●		●	●		0.500	0.531	0.187	0.031	0.217	
		170508-CM	●		●	●		0.657	0.689	0.219	0.031	0.217	
	QCGT	050204-CA						0.197	0.213	0.038	0.016	0.091	
		060204-CA					●	0.236	0.252	0.094	0.016	0.098	
		070304-CA					●	0.276	0.291	0.125	0.016	0.110	
		080304-CA					●	0.315	0.331	0.125	0.016	0.134	
		10T304-CA					●	0.394	0.409	0.156	0.016	0.157	
		130408-CA					●	0.500	0.531	0.187	0.031	0.217	
		170508-CA					●	0.657	0.689	0.219	0.031	0.217	

● : Stock item

Bearing Solution

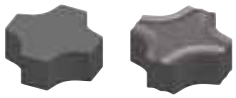
Holder Code System



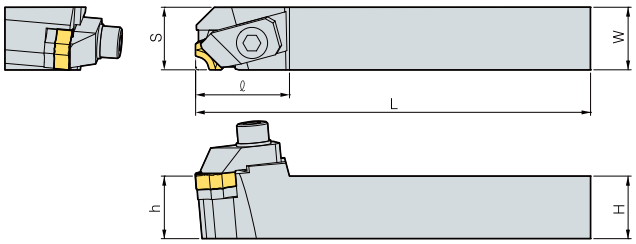
Insert Code System for race way and bearing shield machining

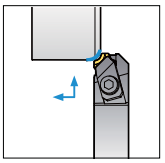
M This is metric size. We can also provide in inch type

CMSN...F Type



MC12□□ MC12□□-BR
MC15□□





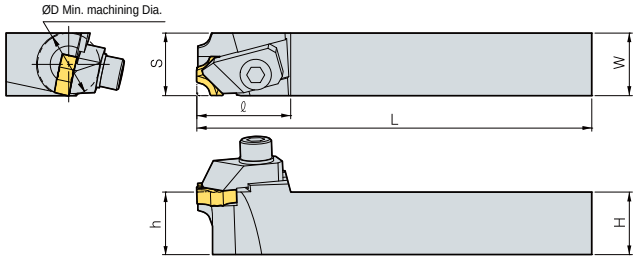
R type insert

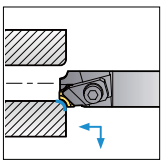
(mm)

Designation		H	W	L	S	h	ℓ	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12F	20	20	140	21	20	33	MC12□□ MC12□□-BR	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2023B-L12F	20	23	140	24	20	33						
	2525B-L15F	25	25	140	26	25	35	MC15□□	CH6R/L1B	BHA0620	SX52CB	SS0408	HW50L

CMSN...B Type

MC12□□ MC12□□-BR



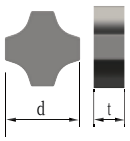
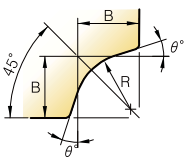
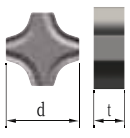


R type insert

(mm)

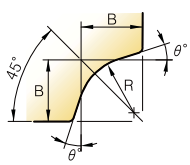
Designation		ØD	H	W	L	S	h	ℓ	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12B-D28	28	20	20	140	21	20	33	MC12□□ MC12□□-BR	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2525B-L12B-D28	28	25	25	140	26	25	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	1620B-L12B-D20	20	16	20	140	18	16	32		CH6R/L1B	BHA0620	-	-	HW50L
	2023B-L12B-D28	28	20	23	140	24	20	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L

Insert

Application	Picture	Designation	Cermet		Dimensions (inch)					Configuration
			CN20	CN2000	R	θ°	B	d	t	
R-Chamfering		MC0906			0.6	12	1.8	9.525	3.18	
		MC0910			1.0	12	2.4	9.525	3.18	
		MC1206			0.6	18	1.8	12.7	4.76	
		MC1210			1.0	18	2.4	12.7	4.76	
		MC1212			1.2	18	2.2	12.7	4.76	
		MC1215			1.5	18	3.0	12.7	4.76	
		MC1220			2.0	18	3.8	12.7	4.76	
		MC1225			2.5	18	2.8	12.7	4.76	
		MC1525			2.5	18	4.0	15.875	5.56	
		MC1530			3.0	18	4.7	15.875	5.56	
		MC1540			4.0	20	4.7	15.875	5.56	
		MC1206-BR			0.6	18	1.8	12.7	4.76	
		MC1210-BR			1.0	18	2.4	12.7	4.76	
		MC1212-BR			1.2	18	2.2	12.7	4.76	
		MC1215-BR			1.5	18	3.0	12.7	4.76	
		MC1220-BR			2.0	18	3.2	12.7	4.76	
		MC1230-BR			3.0	18	3.7	12.7	4.76	
		MC1235-BR			3.5	18	3.9	12.7	4.76	

● : Stock item

Special order-form

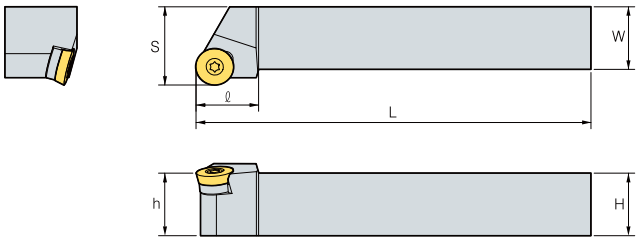


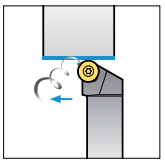
Designation	CN20	CN2000	R	θ°	B	d	t	Configuration
MC...								

M This is metric size. We can also provide in inch type

SRGP...E Type

RPGT1203M0
RPGT1604M0
RPGT2004M0





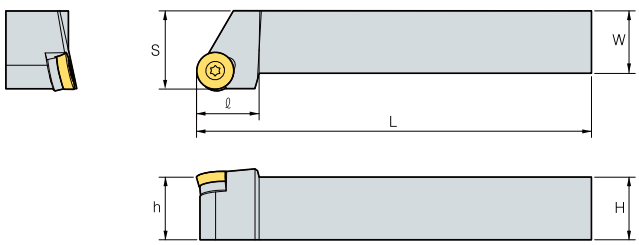
R type insert

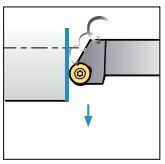
(mm)

Designation		H	W	L	S	h	ℓ	Inserts	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12E	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16E	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20E	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

SRGP...F Type

RPGT1203M0
RPGT1604M0
RPGT2004M0





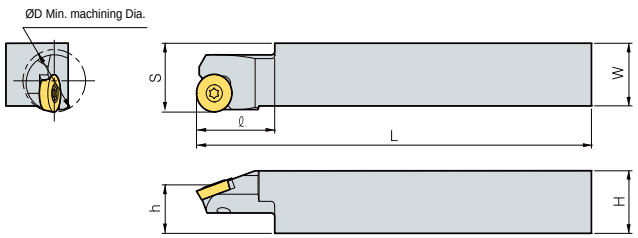
R type insert

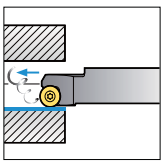
(mm)

Designation		H	W	L	S	h	ℓ	Inserts	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12F	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16F	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20F	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

SRCP...B Type

RPGT0802M0
RPGT1203M0
RPGT1604M0





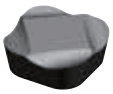
R type insert

(mm)

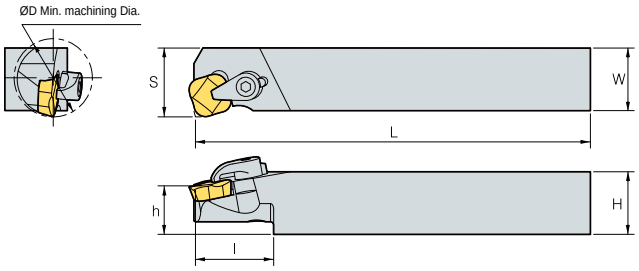
Designation		ØD	H	W	L	S	h	ℓ	Inserts	Screw	Wrench
SRCPR/L	2020B-L08B-D12	12	20	20	140	21.5	15.5	25	RPGT0802M0	FTKA0305	TW09P
	1919B-L12B-D15	15	19	19	140	21	16	25	RPGT1203M0	FTNA0408	TW15P
	2020B-L12B-D20	20	20	20	140	22	15.5	25	RPGT1203M0	FTNA0408	TW15P
	2525B-L16B-D32	32	25	25	140	27	20	30	RPGT1604M0	FTKA0510	TW20P

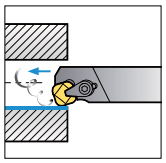
M This is metric size. We can also provide in inch type

CSKP...B Type



SPGR120440L





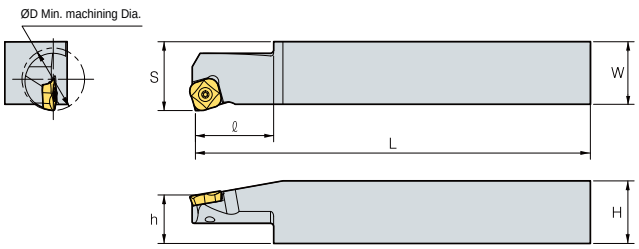
R type insert

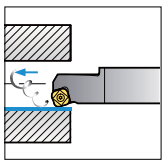
(mm)

Designation		ØD	H	W	L	S	h	ℓ	Inserts	Clamp	Clamp Screw	Wrench
CSKPR/L	2022B-L12B-D30	30	20	22	140	27	20	37	SPGR120440R/L	CH5R1	CHX0510	HW30L

SSKP...B Type

SPGH090330L





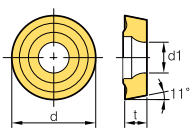
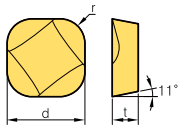
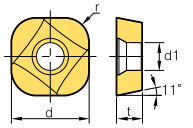
R type insert

(mm)

Designation		ØD	H	W	L	S	h	ℓ	Inserts	Screw	Wrench
SSKPR/L	2020B-L09B-D12	12	20	20	140	21.7	19	20	SPGH090330R/L	FTNA0307	TW09P
	2020B-L09B-D13	13	20	20	140	21.7	19	20			
	2020B-L09B-D20	20	20	20	140	21.7	19	20			

Applicable inserts **C59**

Insert

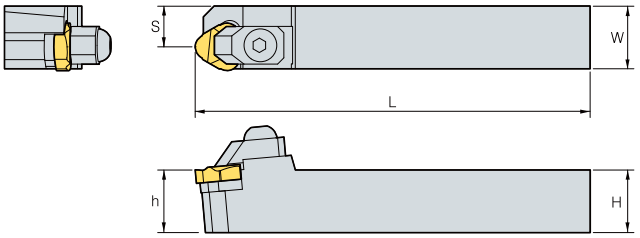
Application	Picture	Designation	Cermet CN20	Cermet CN2000	Dimensions (mm) r	d	d1	t	Configuration
Internal turning		RPGT0802M0			-	8	3.4	2.38	
		RPGT1203M0			-	12	4.4	3.18	
		RPGT1604M0			-	16	5.5	4.76	
		RPGT2004M0			-	20	5.5	4.76	
		SPGR120440L			4.0	12..7	-	4.76	
		SPGH090330L			3.0	9.525	3.4	3.18	

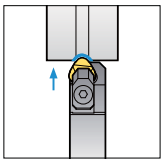
M This is metric size. We can also provide in inch type

● : Stock item

CKFN...RW Type

KORIC





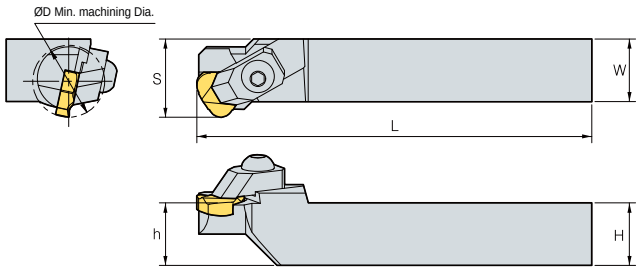
R type insert

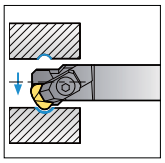
(mm)

Designation		H	W	L	S	h	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKFNR/L	2020B-L22RW	20	20	140	12.5	20	KORIC2204R/L	CH6N1B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW	20	22	140	13	20	KORIC2704R/L	CH8R/L1B	BHA0820	ST52CB	SS0408	HW60L
	2025B-L33RW	20	25	140	16	20	KORIC3306R/L	CH8R/L1B	BHA0820	ST62CB	SS0408	HW60L
	2533B-L44RW	25	33	140	21	25	KORIC4408R/L	CH8R/L1B	BHA0820	ST82CB	SS0408	HW60L

CKGN...RW Type

KORIC





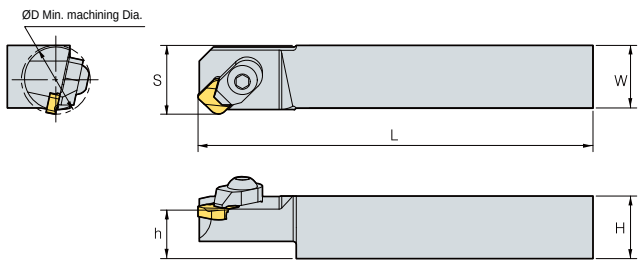
R type insert

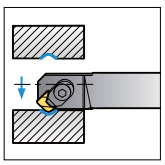
(mm)

Designation		ØD	H	W	L	S	h	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKGNR	2022B-L22RW-D23	23	20	22	140	30	20	KORIC2204R/L	CH6R/L3B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW-D29	29	20	22	140	34	20	KORIC2704R/L	CH6R/L7B	BHA0620	ST52CB	SS0408	HW50L
	2025B-L33RW-D38	38	20	25	140	33	20	KORIC3306R/L	CH6R/L5B	BHA0620	ST62CB	SS0408	HW50L
	2528B-L38RW-D50	50	25	28	140	46	25	KORIC3806R/L	CH8R/L2B	BHA0820	ST72CB	SS0408	HW60L
	2528B-L44RW-D52	52	25	28	140	50	25	KORIC4408R/L	CH8R/L2B	BHA0820	ST82CB	SS0408	HW60L

CSGN...RW Type

SNGN





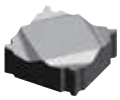
R type insert

(mm)

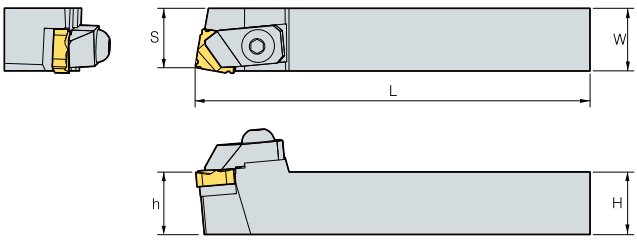
Designation		ØD	H	W	L	S	h	Inserts	Clamp	Clamp Screw	Wrench
CSGNR/L	2020B-L09RW-D17	17	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L
	2020B-L09RW-D22	22	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L

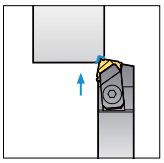
M This is metric size. We can also provide in inch type

CSBN...BS Type



SNGN



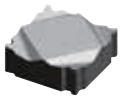


R type insert

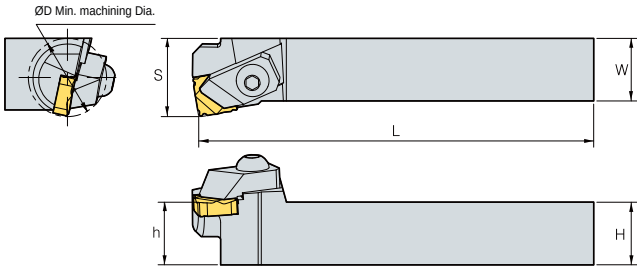
(mm)

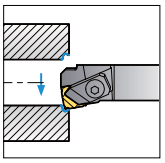
Designation		H	W	L	S	h	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSBNR/L	2023B-L12BS	20	23	140	21	20	SNGN1204SR/L	CH6N1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS	25	25	140	23	25	SNGN1504SR/L	CH6N1B	BHA0620	SS52CB	SS0408	HW50L

CSKN...BS Type



SNGN



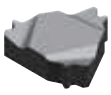


R type insert

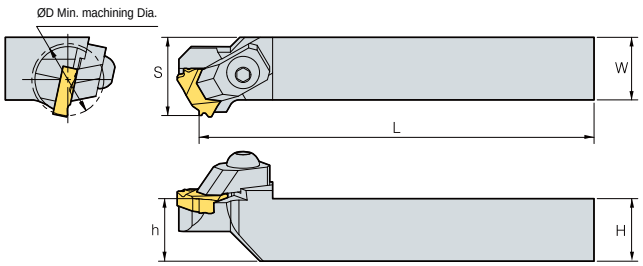
(mm)

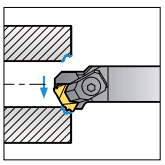
Designation		ØD	H	W	L	S	h	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSKNR/L	1622B-L09BS-D14	14	16	22	140	16	16	SNGN0903SR/L	CH6R/L2B	BHA0620	-	-	HW50L
	2022B-L12BS-D26	26	20	22	140	27	20	SNGN1204SR/L	CH6R/L1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS-D35	35	25	25	140	31	25	SNGN1504SR/L	CH6R/L3B	BHA0620	SS52CB	SS0408	HW50L

CTGN...BS Type



TNGN





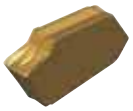
R type insert

(mm)

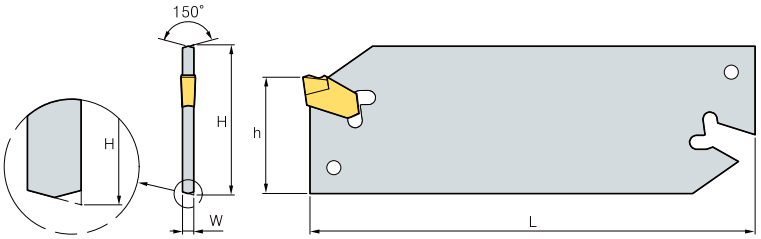
Designation		ØD	H	W	L	S	h	Inserts	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CTGNR/L	2021B-K22BS-D25	25	20	21	140	30	20	TNGN2204SR/L	CH6R/L7B	BHA0620	ST42CB	SS0408	HW50L

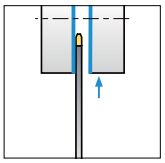
M This is metric size. We can also provide in inch type

SPB-S Type



SP

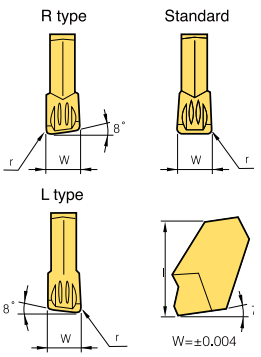




(inch)

Designation		H	W	L	h	Inserts	Wrench
SPBA-S	100-S-2	1	1/16	4 3/8	0.827	SP200, 200R/L	SW15S
	100-S-3	1	3/32	4 3/8	0.827	SP300, 300R/L	
	100-S-4	1	1/8	4 3/8	0.827	SP400, 400R/L	
	100-S-5	1	5/32	4 3/8	0.827	SP500, 500R/L	
	100-S-6	1	13/64	4 3/8	0.827	SP600, 600R/L	
	125-S-2	1 1/4	1/16	6	0.984	SP200, 200R/L	
	125-S-3	1 1/4	3/32	6	0.984	SP300, 300R/L	
	125-S-4	1 1/4	1/8	6	0.984	SP400, 400R/L	
	125-S-5	1 1/4	5/32	6	0.984	SP500, 500R/L	
	125-S-6	1 1/4	13/64	6	0.984	SP600, 600R/L	

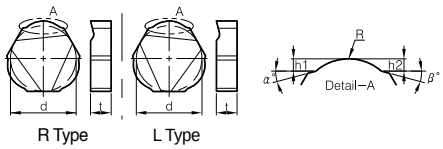
Insert

Application	Picture	Designation		Coated											Un-coated	Dimensions (inch)			Configuration
				NC3120	NC3220	NC3030	NCM325	NC5330	NC9020	PC3500	NC500H	PC8110	PC5300	PC9030	PC6510	ST30A	W	l	r	
Parting tools		SP	160														0.063	0.307	0.006	
			180														0.071	0.366	0.006	
			200		●	●	●	●				●	●	●			0.087	0.366	0.008	
			200R		●	●								●			0.087	0.366	0.008	
			200L											●			0.087	0.366	0.008	
			300	●	●	●	●	●	●			●	●	●		●	0.122	0.445	0.008	
			300R		●	●	●					●					0.122	0.445	0.008	
			300L			●											0.122	0.445	0.008	
			400	●	●	●	●	●				●	●	●	●		0.161	0.445	0.010	
			400R		●	●						●					0.161	0.445	0.010	
			400L			●											0.161	0.445	0.010	
			500	●	●	●	●	●			●	●	●		●		0.201	0.449	0.012	
			500R														0.201	0.449	0.012	
			500L														0.201	0.449	0.012	
			600		●	●		●					●		●		0.252	0.449	0.014	
			600R														0.252	0.449	0.014	
			600L														0.252	0.449	0.014	

● : Stock item

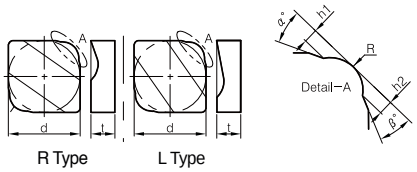
Machining Race-way

KORIC... R/L Type



		d	t	R	h1	h2	α°	β°
KORIC	2204R/L	12.7	4.76					
	2704R/L	15.875	4.76					
	3306R/L	19.05	6.0					
	3806R/L	22.225	6.0					
	4408R/L	25.4	8.0					

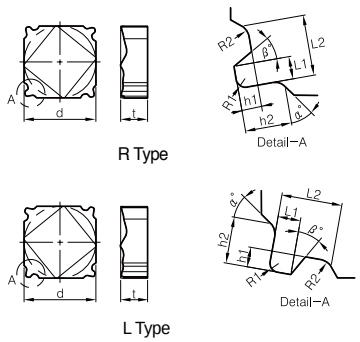
SNGN... WR/L Type



		d	t	R	h1	h2	α°	β°
SNGN	0903WR/L	9.525	3.18					
	1504WR/L	15.875	4.76					
	1905WR/L	19.05	5.56					

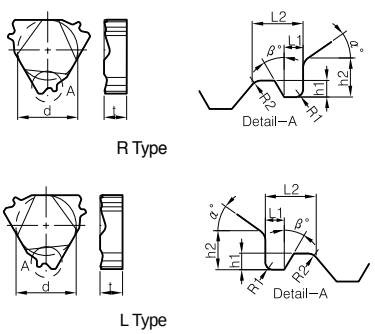
Machining for Bearing shield

SNGN...SR/L Type



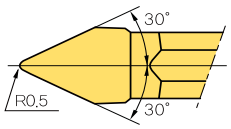
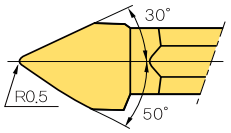
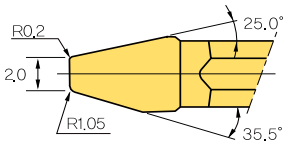
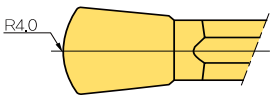
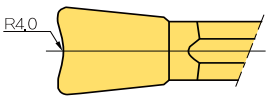
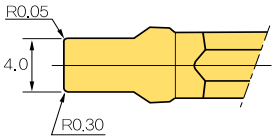
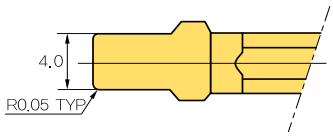
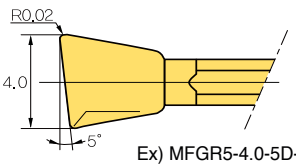
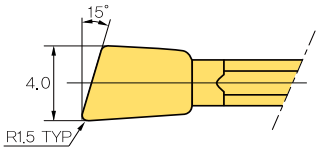
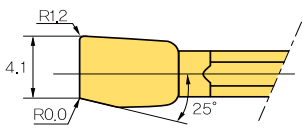
		d	t	L1	L2	h1	h2	R1	R2	α°	β°
SNGN	0903SR/L	9.525	3.18								
	1204SR/L	12.7	4.76								
	1504SR/L	15.875	4.76								

TNGN...SR/L Type



		d	t	L1	L2	h1	h2	R1	R2	α°	β°
TNGN	02204SR/L	12.7	4.76								

M This is metric size. We can also provide in inch type

Code system	Configuration
M F G N 4 - 0.5R - 30D ① ② ③ ④ ⑤ ⑥ ⑦ ① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part : 4mm ⑥ Nose Radius : 0.5 ⑦ Degree : 30°	 Ex) MFGN4-0.5R-30D
MFGN4 - 0.5R - L 50 D - R 30D ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Nose Radius : 0.5 ③ Left ④ Degree : 50° ⑤ Right ⑥ Degree > 30°	 Ex) MFGN4-0.5R-L50D-R30D
MFGN4 - 2.0 - R 020 250 - L 105 335 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ① Refer to No. 1 ② Width of cutting edge : 2.0mm ③ Right ④ Nose Radius : 0.20 ⑤ Degree : 25.0° ⑥ Left ⑦ Nose Radius : 1.05 ⑧ Degree : 35.5°	 Ex) MFGN4-2.0-R020250-L105335
MFGN5 - 4.0R F ① ② ③ ① Refer to No. 1 ② Radius : 4.0 ③ Front(Concave)	 Ex) MFGN5-4.0RF
MFGN5 - 4.0R B ① ② ③ ① Refer to No. 1 ② Radius : 4.0 ③ Back(Concave)	 Ex) MFGN5-4.0RB
MFGN5 - 4.0 - R 005 - L 030 ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Width of cutting edge : 4.0mm ③ Right ④ Nose Radius : 0.05 ⑤ Left ⑥ Nose Radius : 0.30	 Ex) MFGN5-4.0-R005-L030
MFGN5 - 4.0 - 0.05 R ① ② ③ ① Refer to No. 1 ② Width of cutting edge: 4.0mm ③ Nose Radius : 0.05	 Ex) MFGN5-4.0-0.05R
MFG R 5 - 4.0 - 5D - R 002 - L 115 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge : 4.0mm ⑤ Lead angle : 5° ⑥ Right ⑦ Nose Radius : 0.02 ⑧ Left ⑨ Nose Radius : 1.15	 Ex) MFGR5-4.0-5D-R002-L115
MFG L 5 - 4.0 - 15D - 1.5R ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Left ③ Clamp part: 5mm ④ Width of cutting edge : 4.0mm ⑤ Lead angle : 15° ⑥ Right Nose Radius : 1.5	 Ex) MFGL5-4.0-15D-1.5R
MFG R 5 - 4.10 - 25D - R012 - L000 ① ② ③ ④ ⑤ ⑥ ⑦ ① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge : 4.1mm ⑤ Degree : 25° ⑥ Right Nose Radius : 1.2 ⑦ Left Nose Radius : 0.0	 Ex) MFGR5-4.10-25D-R012-L000

M This is metric size. We can also provide in inch type

Code system

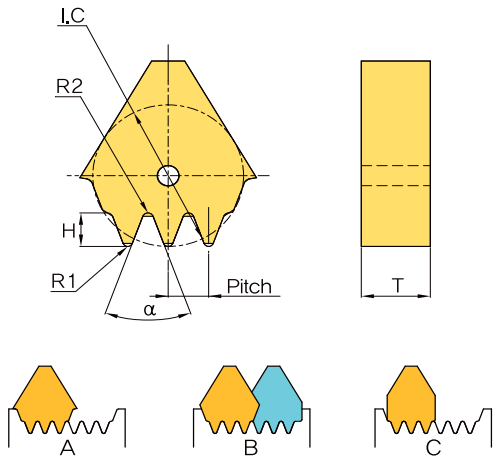
KP	27	064	-	R0.425	N3
KORLOY PULLEY	ØD	W		R1	No. of flutes

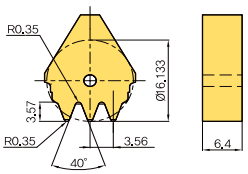
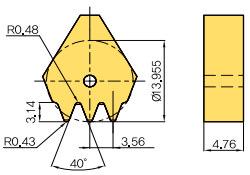
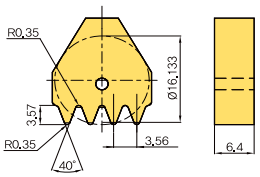
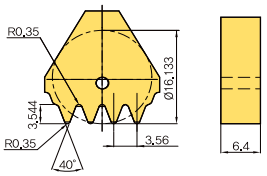
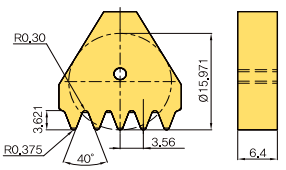
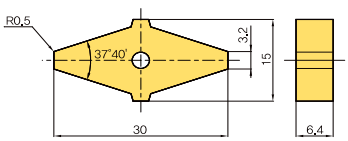
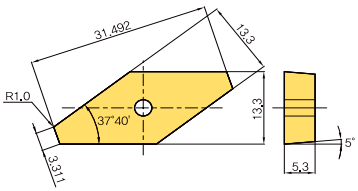
■Ex)

I.C	T	R	Z
Ø 12.7	6.4	0.425	

▶ Special types are available for quotation

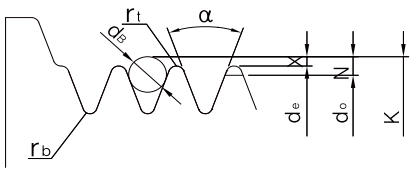
Insert for machining of pulley



Standard designation	Specifications
KP27064-R0.35-N3 (DF356-3B)	
KP27064-R0.43-N3 (DF356-3SR)	
KP27064-R0.35-N4 (DF356-4B)	
KP27064-R0.35-N4-A (DF356-4X)	
KP27064-R0.375-N5 (DF356-5B)	
UF320	
VF13M522	

▶ For reference : KS specifications and cods for V-pulley for vehicles(PK)

Diameter



- de : Effective diameter
- do : Outer diameter
- K : Diameter of ball or rod
- da : Diameter of ball for inspection or rod

Code system

P	6	PK96.3
Pulley		
	No. of groove	
		Cross section of groove
		Effective diameter(inch)

Cross section		PH	PJ	PK	PL	PM
Pitch of grrove		1.6±0.03	2.34±0.03	3.56±0.05	4.7±0.05	9.4±0.08
Groove angle	±0.5°	40°	40°	40°	40°	40°
rt	Min.	0.15	0.2	0.25	0.4	0.75
rb	Max.	0.3	0.4	0.5	0.4	0.75
dB	±0.01	1	1.5	2.5	3.3	6.4
Application		electrical, electronics instrument	Machine with light duty, Compressor, Pump	Vehicles	Small agricultural machine	Large agricultural machine

M This is metric size. We can also provide in inch type

D

THREADING

Korloy threading tools are available for machining of various shapes of thread at various pitches with high quality.

THREADING

Threading Holder Code System

E R H 031 (N) - 11 (C)

1 Holder Type | 2 Hand of Insert | 3 Name | 4 Height of shank | 5 Shim | 6 Insert Size (inch) | 7 Clmaping System

1 Holder Type
E R H 031 (N) - 11 (C)

E : For External I : For Internal

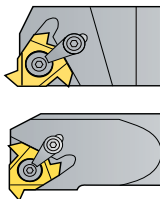
2 Hand of Insert
E R H 031 (N) - 11 (C)

R : Right handed L : Left handed

3 Name
E R H 031 (N) - 11 (C)

H : Holder

4 Height of shank
E R H 031 (N) - 11 (C)



• Refer to the specification for shank diameter information

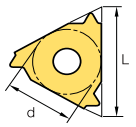
031 : 0.31
0375 : 0.375
050 : 0.50
0625 : 0.625
075 : 0.75
100 : 1.00
125 : 1.25
150 : 1.50
200 : 2.00
250 : 2.50

5 Shim
E R H 031 (N) - 11 (C)

No code : Shim required
N : No shim required

6 Insert Size (inch)
E R H 031 (N) - 11 (C)

11 : d=1/4
16 : d=3/8
22 : d=1/2
27 : d=5/8



7 Clmaping System
E R H 031 (N) - 11 (C)

No code : Screw on system
C : Clamp on system

Threading Insert Code System

E R M 16 - 1.5 ISO

1 Insert Type | 2 Hand of Insert | 3 Chip Breaker | 4 Insert Size (inch) | 5 Pitch | 6 Standard

1 Insert Type
E R M 16 - 1.5 ISO

E : External thread I : Internal thread

2 Hand of Insert
E R M 16 - 1.5 ISO

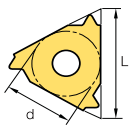
R : Right handed L : Left handed

3 Chip Breaker
E R M 16 - 1.5 ISO

M : With Chip Breaker

4 Insert Size (inch)
E R M 16 - 1.5 ISO

11 : d=1/4
16 : d=3/8
22 : d=1/2
27 : d=5/8



Insert Shape


<ER / IR>


<ERM / IRM>

5 Pitch
E R M 16 - 1.5 ISO

Full profile		Partial profile		
inch	tpi		inch	tpi
0.35 - 6.0	72 - 3	A	0.5 - 1.5	48 - 16
		AG	0.5 - 3.0	48 - 8
		G	1.75 - 3.0	14 - 8
		N	3.5 - 5.0	7 - 5
		Q	5.5 - 6.0	4.5 - 4

6 Standard
E R M 16 - 1.5 ISO

Partial profile 60°
Partial Profile 55°
ISO Metric (Full Profile)
American UN (Full Profile) UN, UNC, UNF, UNEF
Whitworth (Full Profile) BSW, BSF, BSP
British Standard Pipe thread (Full Profile) BSPT
National Pipe Thread (Full Profile) NPT
National Pipe Threads-Dryseal (Full Profile) NPTF
Round DIN 405
Trapez DIN 103
American ACME
Stub ACME
UNJ
American Buttress
British Buttress
Metric Buttress-Sagengewinde
API
API Buttress Casing
API Round Casing & Tubing
EL-Extreme Line

Special Features

External Thread

A thread on the external surface of a cylinder screw or cone

Depth of Thread

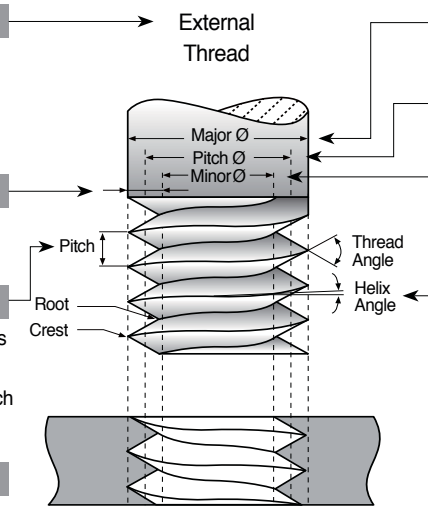
The distance between the crest and root measured from normal to the axis

Pitch

The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal Diameter

The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Internal Thread

A thread on the internal surface of a cylinder or cone

Major Diameter

The largest diameter of a screw thread

Pitch Diameter

On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor Diameter

The smallest diameter of a screw thread

Helix Angle

For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

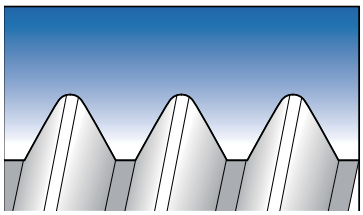
Straight Thread

A thread formed on a cylinder

Taper Thread

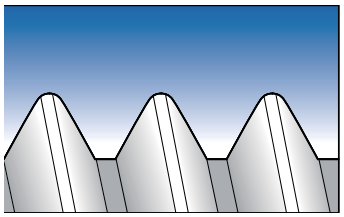
A thread formed on a cone

Left handed thread



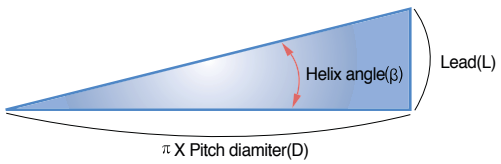
A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH

Right handed thread



A thread which, when viewed axially, winds in a clockwise and receding direction
Threads are always right handed unless they are specified

The Helix Angle (β)

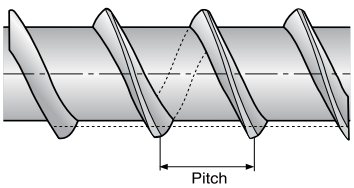


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

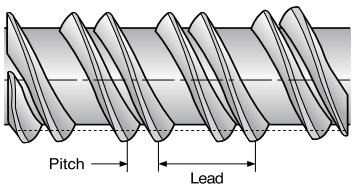
Machining a Multi-start Thread

▶ A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form

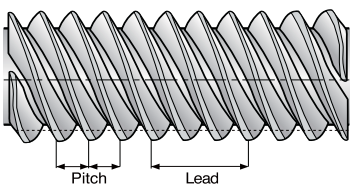
First Start Machined



Second Start Machined

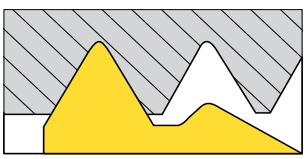


Third Start Machined (Final, 3 Starts Thread)



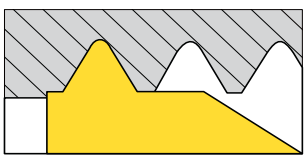
Insert Profile Style

Partial Profile



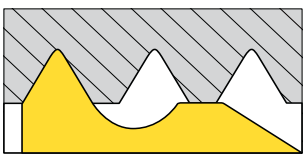
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle

Full Profile



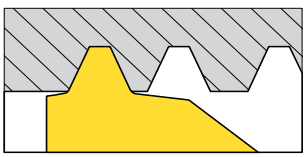
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required

Full Profile for Fine Pitches



The full profile for Fine Pitches will form a complete thread
The topping of the outer diameter is generated by second tooth

Semi Full

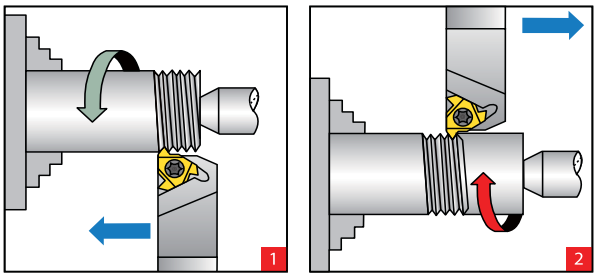


The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter
Mainly used for trapezoidal profiles

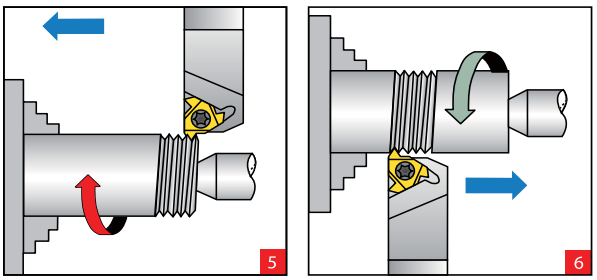
Thread Turning Method

Thread	Inserts & Tool holder	Rotation	Feed Direction	Helix Method	Drawing No.
Right Hand Externa	EX RH	Counter clockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN LH	Counter clockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counter clockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counter clockwise	From chuck	Reversed	8

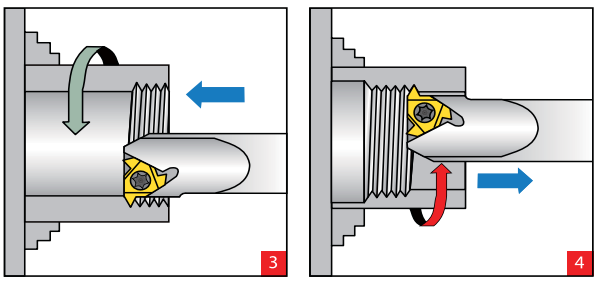
External RH Thread



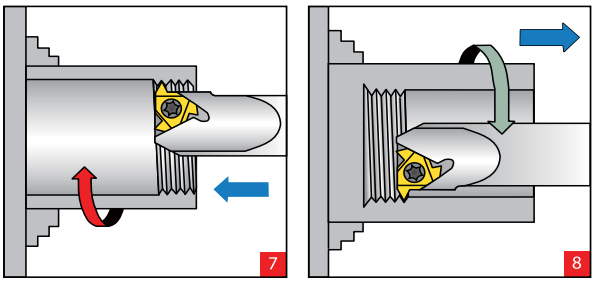
External LH Thread



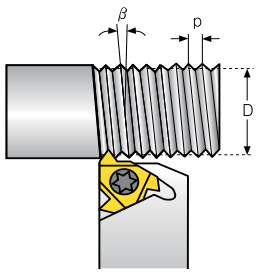
Internal RH Thread



Internal LH Thread



Calculating the Helix Angle(β)



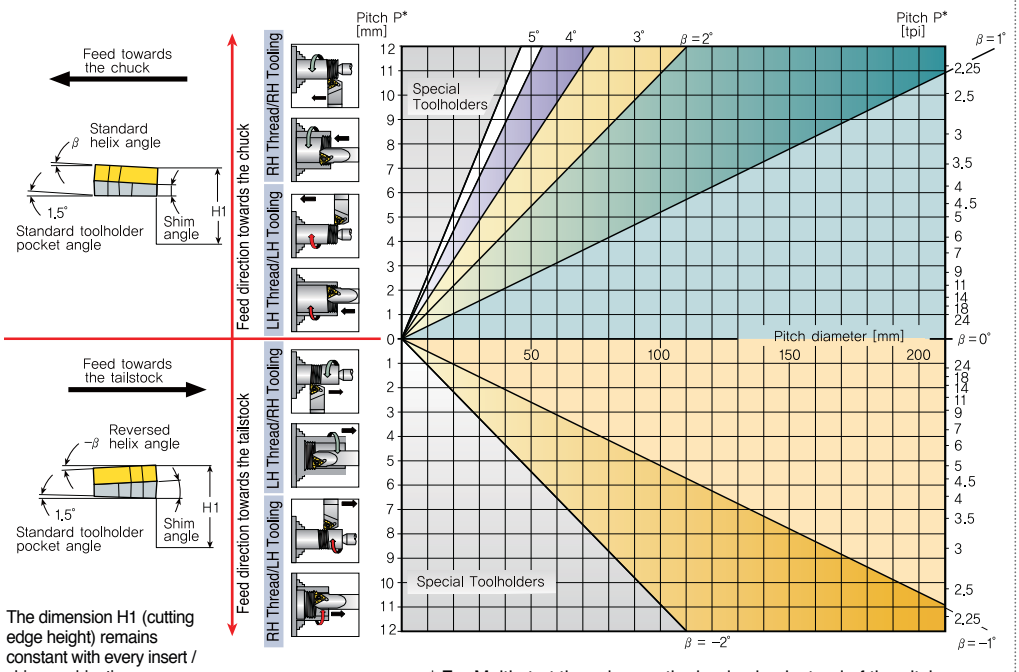
• The helix angle is calculated by the following formula :

$$\beta = \tan^{-1}\frac{P \times N}{\pi \times D}$$

β - Helix angle(°)
P - Pitch(inch)
N - No. of starts
D - Pitch diameter(inch)
Lead = P x N

• The helix angle can also be found from the diagram below

Helix Angle Diagram

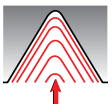


The dimension H1 (cutting edge height) remains constant with every insert / shim combination

* For Multi-start threads, use the lead value instead of the pitch

Thread Infeed Method

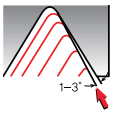
Radial Infeed



Radial infeed is the simplest and quickest method.The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation. Radial infeed is recommended in 3 cases

- when the pitch is smaller than 16 tpi
- for material with short chips
- for work with hardened material

Flank Infeed (modified)



Flank infeed is recommended in the following cases

- When the thread pitch is greater than 16 tpi. Using the radial method,the effective cutting edge length is too large, resulting in chatter. for TRAPEZ and ACME. The radial method result in three cutting edges, making chip flow very difficult

Alternate Flank Infeed

Use of the alternate flank method is recommended especially in large pitches and for materials with long chils

- This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes

Shim

Standard Shim		Helix angle 1.5°								
			Insert Size	d	9.525 (3/8)		12.7 (1/2)		15.875 (5/8)	
				L	16		22		27	
			Holder		ER(L)H	IR(L)H	ER(L)H	IR(L)H	ER(L)H	IR(L)H
			Ordering Code		ATE16	ATI16	ATE22	ATI22	ATE27	ATI27

※ Standard shim has lead angle 1.5°

Application grade

Grade	Features	Available insert type
PC5300	• **PVD Universal Grade** For chip breaker type only Stable machining on a wide application due to fine-grained carbide substrate with balanced heat resistance and toughness Excellent wear resistance and oxidation resistance due to AiTN coating film Outstanding performance on high speed machining	ERM/IRM (Insert with Chip breaker)
PC3030T	• **General Grade** A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance Outstanding performance on STS and hard to cut materials	ER/IR (Ground insert)

Recommended Cutting Speed as per workpiece(vc)

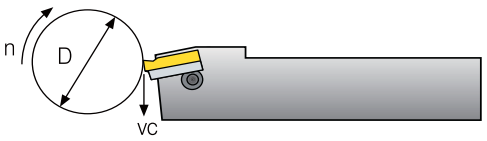
ISO	Work piece	
P	Carbon steel, Alloy steel, Cast Steel	PC5300 PC3030T
M	Stainless steel, Heat resistant steel, Titanium alloy steel	PC5300 PC3030T
K	Carbon Iron, Aluminum, Cast Steel, Copper	PC5300 PC3030T

Recommended Cutting Speed as per workpiece(vc)

Material			Hardness Brinell (HB)	ISO vc(sfm) PC3030T
P	Carbon steel	Low carbon (C=0.1-0.25 %)	125	380~630
		Medium carbon (C=0.25-0.55 %)	150	330~580
		High carbon (C=0.55-0.85 %)	170	300~510
	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	330~600
		Hardened	275	250~460
		Hardened	350	230~450
	High alloy steel (alloying elements > 5%)	Annealed	200	260~400
		Hardened	325	170~330
	Cast steel	Low alloy (alloying elements <5%)	200	230~430
		High alloy (alloying elements >5%)	225	200~400
M	Stainless steel Ferritic	Non hardened	200	230~430
		Hardened	330	170~310
	Stainless steel Austenitic	Austenitic	180	260~400
		Super austenitic	200	100~330
	Stainless steel Cast ferritic	Non hardened	200	300~400
		Hardened	330	220~360
	Stainless steel Cast austenitic	Austenitic	200	280~360
		Hardened	330	200~330
	High temperature alloy	Annealed (Iron based)	200	150~200
		Aged (Iron based)	280	100~170
		Annealed (Nickel or Cobalt based)	250	70~100
		Aged (Nickel or Cobalt based)	350	50~80
	Titanium alloy	99.5% pure Titanium	400Rm	460~560
		Titanium alloy	1050Rm	170~230
K	Extra hard steel	Hardened & tempered	55HRC	150~200
	Malleable cast iron	Ferritic (short chips)	130	230~400
		Pearlitic (long chips)	230	230~400
	Gray cast iron	Low tensile strength	180	230~430
		High tensile strength	260	200~330
	Nodular SG iron	Ferritic	160	410~530
		Pearlitic	260	300~400
	Aluminum alloy Wrought	Non aging	60	330~830
		Aged	100	260~600
	Aluminum alloy	Cast	75	660~1300
		Cast & aged	90	660~920
		Cast Si 13-22%	130	200~500
	Copper and copper alloy	Brass	90	260~400
		Bronze and non leaded copper	100	260~400

Calculation of N [RPM]

$$n = \frac{vc \times 12}{\pi \times D} \qquad vc = \frac{\pi \times D \times n}{12}$$



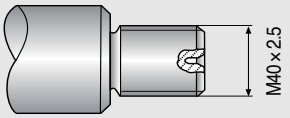
n - Revolution Per Minute [min^{-1}]
vc - Cutting Speed [sfm]
D - Workpiece Diameter [inch]

Number of Passes

Pitch																
	mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00
	tpi	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
No. of passes		4~6	4~7	4~8	5~9	6~10	7~12	7~12	8~14	9~16	10~18	11~18	11~19	12~20	12~20	12~20	15~24

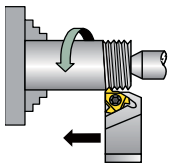
※ One cutting depth is calculated by total cutting depth divided into machining times
ex) ER16-1.5ISO, hmin 0.92 : If 10times machining, one cutting depth is 0.092(0.92/10)

Step by step Thread Turning



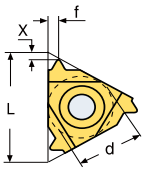
Application Thread : External Right Hand ISO Metric M40 x 2.5
Material : 4140 (25 HRC)

1 Choose the Thread Turning Method



Feed direction towards the chuck was chosen
Therefore an external right hand insert and an external right hand holder will be used

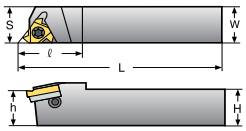
2 Choose the Insert Size



Chosen insert : **ER16 - 2.5 ISO**

Insert Size	Pitch	Ordering Code	Shim	Tool holder
d	mm	RH (**RH**)	RH (**RH**)	
3/8	2.5	ER16-2.5ISO	ATE16	ERH□□-16

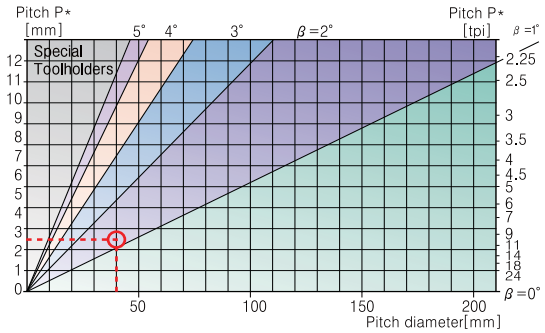
3 Choose the Tool holder



Chosen tool holder **: ERH 25 - 16**

Insert Size	Ordering code	Dimensions(inch)				
d	RH (**RH**)	H=h	W	S	L	ℓ
3/8	ERH25-16	0.625	0.625	0.625	5.0	1.02

4 Determine the Helix Angle



From the table, using a pitch of 2.5mm(10 tpi) and a workpiece diameter of 40mm (1.57″), we find the helix angle to be 1.5°

5 Choose the Correct Shim

Shim Chosen **: ATE16**

Resultant Helix Angle		1.5°
Insert Size	d	3/8
	L	16
Odering Code		ATE16

6 Choose the Carbide Grade and Cutting Speed

Carbide grade chosen : PC3030T / Cutting speed : 460sfm

Material			HB	vc(sfm)
				PC3030T
P	**Low alloy steel** (alloying elements ≤ 5%)	Non hardened	180	330~600
		Hardened	275	250~460
		Hardened	350	230~450

7 Determine the Number of Passes

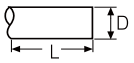
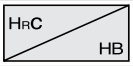
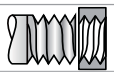
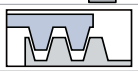
Carbide grade chosen : PC3030T
Cutting speed : 460sfm

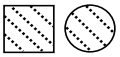
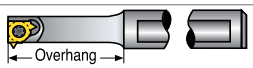
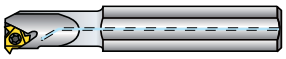
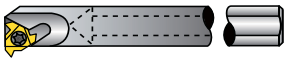
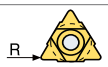
Pitch								
	inch	1.50	1.75	2.00	2.50	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No.of passes		6 ~10	7~12	7~12	8 ~14	9 ~16	10 ~18	11~18

8 Summary

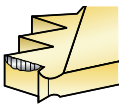
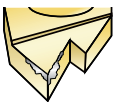
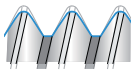
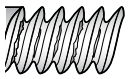
Thread type	ISO M40 x 2.5 External Right Hand
1. Feed Direction	Towards the chuck
2. Insert and Grade	ER16-2.5 ISO, PC3030T
3. Tool holder	ERH25-16
4. Helix Angle	1.5°
5. Shim	ATE16
6. Cutting Speed	460sfm
7. Number of Passes	10

Cutting Condition depending on

Workpiece	Material Type	
	Material Dimension	
	Diameter and Length Chipflow Character	
	Material Hardness	
Thread Application	External or Internal	
	Profile Shape	
	Surface Finish	
Machine	Machine Stability	
	Max. RPM	
	Clamping System Stability	

Coolant	Coolant Type	
Holders	Holder Cross Section Area	
	Holder Overhang	
	Through Coolant Option	
	Shank Type: Carbide, Alloy,	
Insert	Carbide Implant Grade	
	Profile Shape: Pitch and Depth	
	Nose Radius	
	Chipbreaker Style	

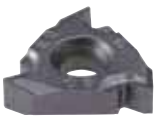
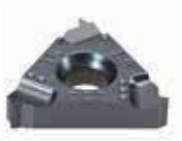
Trouble Shooting

Problem	Possible Cause	Solution
 **Increased flank wear**	Cutting speed too hight	Reduce cutting speed/ use coated insert
	Depth of cut too low/too many passes	Increase the depth of cut per pass
	Unsuitable carbide grade	Use a coated carbide grade
	Insufficient cooling	Increase coolant flow rate
 **Uneven cutting edge wear**	Incorrect helix angle	Choose the correct shim
	Wrong infeed method	Use the Alternating Flank Infeed method
 **Extreme plastic deformation**	Depth of cut too large	Decrease depth of cut/ increase number of passes
	Insufficient cooling	Increase coolant flow rate
	Cutting speed too high	Reduce cutting speed
	Unsuitable carbide grade	Use a tougher carbide
	Nose radius too small	Use an insert with a larger radius, if possible
 **Cutting edge breakage**	Depth of cut too large	Decrease depth of cut/ increase number of passes.
	Extreme plastic deformation	Use a tougher carbide
	Insufficient cooling	Increase flow rate and/ or correct flow direction
	Unsuitable ca rbide grade	Use a tougher carbide
	Instability	Check stability of the system
 **Built-up edge**	Incorrect cutting speed	Change the cutting speed
	Unsuitable carbide grade	Use a coated carbide
 **Thread profile is too shallow**	The tool is not at the workpiece axis height	Change tool height
	Insert is not machining the thread crest	Measure the workpiece diameter
	Worn insert	Change the cutting edge sooner
 **Poor surface quality**	Too low cutting speed	Increase cutting speed
	Wrong shim	Choose correct shim
	Flank infeed method is not appropriate	Use the alternate flank or radial infeed method

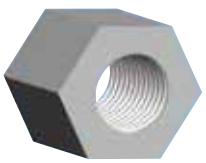
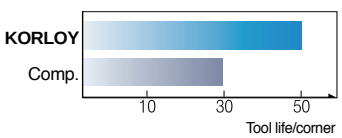
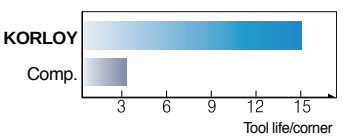
Threading insert with chip breaker

Features

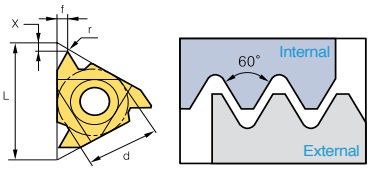
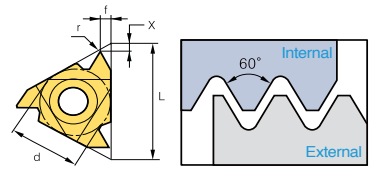
- ▶ Economical insert
- ▶ Good toughness and high accuracy as ground type inserts
- ▶ Exclusive insert design improves chip control.
- ▶ New grade for general application of various kinds of workpieces

Type	Ground insert		Insert with a chip breaker			
C/B Code	None		None		U	
Designation	ER16-1.5ISO		ERM16-1.5ISO		ERM16-1.5ISO-U	
Machining	External	Internal	External	Internal	External	Internal
Insert Shape						
Chip Shape						
Class	P, M, K, N, S		P, M, K		P, M, K	
Application	G-Class		M-Class		M-Class	
Features	• Groove-shaped chip breaker with superior chip evacuation lowers cutting load. • Enables high precision machining. • Applicable for machining of various shapes of threads. • Applicable for machining of various workpieces.		• Unique 3 dimensional chip breaker improves machinability with good chip control. • Excellent cutting edge treatment technology ensures high precision sharp cutting edge.		• Groove-shaped chip breaker with superior chip evacuation lowers cutting load. • Reduces machining pass by 10~30%. • Excellent cutting edge treatment achieves high precision sharp cutting edge.	

Machining Example

Korloy		ERM16-1.5ISO [PC3030T]	IRM16-2.0ISO [PC3030T]
Competitor tools		ERM16-1.5ISO [K-Maker]	IRM16-2.0ISO [S-Maker]
Workpiece	Material	SCM440	STS304
	Figure		
Cutting condition	Cutting speed (sfm)	200	400
	Pass	8	9
	Machining	Radial infeed	Radial infeed
	Pitch	1.5	2.0
Coolant		Wet	Wet
Result			
		Increased tool life with good chip breaking	Prevention outbreak damage of insert due to smooth chip control

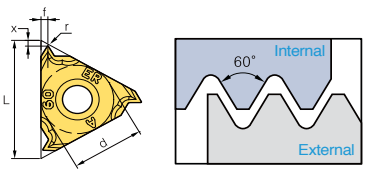
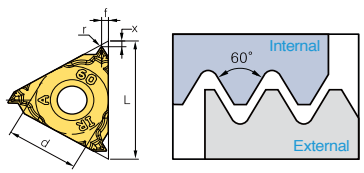
Partial profile 60°

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A60	●	EL 11-A60		0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A60	●	16-A60	●	0.5~1.5	48~16	3/8	0.630	0.011	0.05	0.07	
	16-G60	●	16-G60	●	1.75~3.0	14~8	3/8	0.630	0.011	0.05	0.07	
	16-AG60	●	16-AG60	●	0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N60	●	22-N60	●	3.5~5.0	7~5	1/2	0.866	0.021	0.07	0.10	
	27-Q60	●	27-Q60		5.5~6.0	4.5~4	5/8	1.063	0.021	0.07	0.10	
Internal	IR 11-A60	●	IL 11-A60	●	0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A60	●	16-A60	●	0.5~1.5	48~16	3/8	0.630	0.002	0.03	0.04	
	16-G60	●	16-G60	●	1.75~3.0	14~8	3/8	0.630	0.006	0.05	0.07	
	16-AG60	●	16-AG60	●	0.5~3.0	48~8	3/8	0.630	0.002	0.05	0.07	
	22-N60	●	22-N60		3.5~5.0	7~5	1/2	0.866	0.012	0.08	0.10	
	27-Q60	●	27-Q60		5.5~6.0	4.5~4	5/8	1.063	0.012	0.07	0.11	

Applicable holders, **D31, D32**

● : Stock item

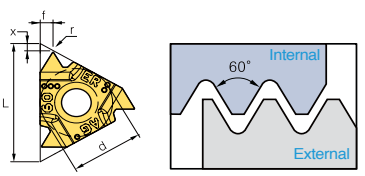
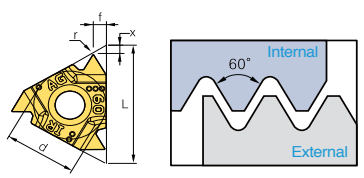
Partial profile 60° (M Chip Breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A60	●				0.5~1.5	48~16	3/8	0.630	0.003	0.05	0.07	
	16-G60	●				1.75~3.0	14~8	3/8	0.630	0.003	0.05	0.07	
	16-AG60	●				0.5~3.0	48~8	3/8	0.630	0.030	0.05	0.07	
	22-N60	●				3.5~5.0	7~5	1/2	0.866	0.021	0.07	0.10	
Internal	IRM 11-A60	●				0.5~1.5	48~16	1/4	0.433	0.003	0.03	0.04	
	16-A60	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G60	●				1.75~3.0	14~8	3/8	0.630	0.047	0.05	0.07	
	16-AG60	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N60	●				3.5~5.0	7~5	1/2	0.866	0.012	0.07	0.10	

Applicable holders, **D31, D32**

● : Stock item

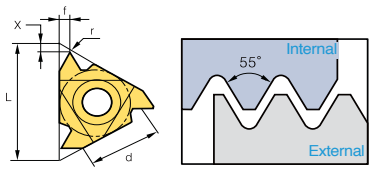
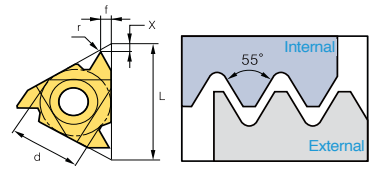
Partial profile 60° (U Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG60-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
Internal	IRM 16-AG60-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	

Applicable holders, **D31, D32**

● : Stock item

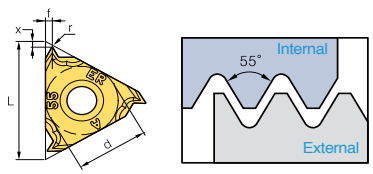
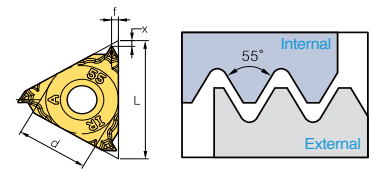
Partial profile 55°

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A55		EL 11-A55		0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A55	●	16-A55		0.5~1.5	48~16	3/8	0.630	0.002	0.03	0.04	
	16-G55	●	16-G55		1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●	16-AG55	●	0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●	22-N55		3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	
	27-Q55		27-Q55		5.5~6.0	4.5~4	5/8	1.063	0.024	0.08	0.11	
Internal	IR 11-A55	●	IL 11-A55		0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A55	●	16-A55		0.5~1.5	48~16	3/8	0.630	0.020	0.02	0.04	
	16-G55	●	16-G55		1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●	16-AG55		0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●	22-N55		3.5~5.0	7~5	1/2	0.866	0.017	0.67	0.10	
	27-Q55		27-Q55		5.5~6.0	4.5~4	5/8	1.063	0.024	0.08	0.10	

Applicable holders D31, D32

● : Stock item

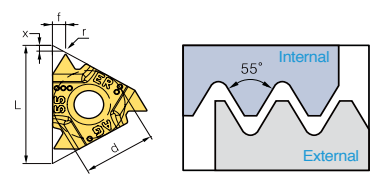
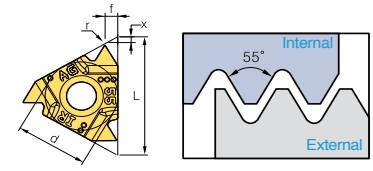
Partial profile 55° (M Chip Breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A55	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G55	●				1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●				3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	
Internal	IRM 11-A55	●				0.5~1.5	48~16	1/4	0.433	0.003	0.03	0.04	
	16-A55	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G55					1.75~3.0	14~8	3/8	0.630	0.009	0.05	0.07	
	16-AG55	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●				3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	

Applicable holders D31, D32

● : Stock item

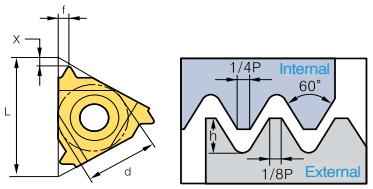
Partial profile 55° (U Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG55-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
Internal	IRM 16-AG55-U					0.5~3.0	48~8	3/8	0.630	0.003	0.005	0.07	

Applicable holders D31, D32

● : Stock item

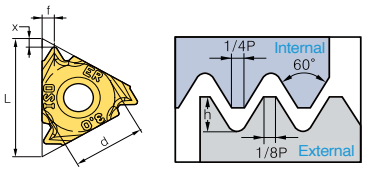
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-0.35ISO			EL 11-0.35ISO		0.35	1/4	0.433	0.008	0.03	0.02	
	11-0.4ISO			11-0.4ISO		0.4	1/4	0.433	0.011	0.03	0.02	
	11-0.45ISO			11-0.45ISO		0.45	1/4	0.433	0.011	0.03	0.02	
	11-0.5ISO			11-0.5ISO		0.5	1/4	0.433	0.012	0.02	0.02	
	11-0.6ISO			11-0.6ISO		0.6	1/4	0.433	0.015	0.02	0.02	
	11-0.7ISO			11-0.7ISO		0.7	1/4	0.433	0.017	0.02	0.02	
	11-0.75ISO			11-0.75ISO		0.75	1/4	0.433	0.017	0.02	0.02	
	11-0.8ISO			11-0.8ISO		0.8	1/4	0.433	0.019	0.02	0.02	
	11-1.0ISO			11-1.0ISO		1.0	1/4	0.433	0.024	0.02	0.03	
	11-1.25ISO			11-1.25ISO		1.25	1/4	0.433	0.030	0.03	0.04	
	11-1.5ISO	●		11-1.5ISO		1.5	1/4	0.433	0.036	0.03	0.04	
	11-1.75ISO			11-1.75ISO		1.75	1/4	0.433	0.042	0.03	0.04	
	16-0.35ISO			16-0.35ISO		0.35	3/8	0.630	0.008	0.03	0.02	
	16-0.4ISO			16-0.4ISO		0.4	3/8	0.630	0.010	0.03	0.02	
	16-0.45ISO	●		16-0.45ISO		0.45	3/8	0.630	0.011	0.03	0.02	
	16-0.5ISO	●		16-0.5ISO	●	0.5	3/8	0.630	0.012	0.03	0.02	
	16-0.6ISO	●		16-0.6ISO		0.6	3/8	0.630	0.015	0.02	0.02	
	16-0.7ISO	●		16-0.7ISO		0.7	3/8	0.630	0.017	0.02	0.02	
	16-0.75ISO	●		16-0.75ISO		0.75	3/8	0.630	0.018	0.02	0.02	
	16-0.8ISO	●		16-0.8ISO		0.8	3/8	0.630	0.019	0.02	0.03	
	16-1.0ISO	●	●	16-1.0ISO	●	1.0	3/8	0.630	0.024	0.02	0.03	
	16-1.25ISO	●		16-1.25ISO		1.25	3/8	0.630	0.030	0.03	0.04	
	16-1.5ISO	●	●	16-1.5ISO	●	1.5	3/8	0.630	0.036	0.03	0.04	
	16-1.75ISO	●	●	16-1.75ISO		1.75	3/8	0.630	0.042	0.04	0.05	
	16-2.0ISO	●	●	16-2.0ISO	●	2.0	3/8	0.630	0.048	0.04	0.05	
	16-2.5ISO	●		16-2.5ISO		2.5	3/8	0.630	0.060	0.04	0.07	
	16-3.0ISO	●		16-3.0ISO		3.0	3/8	0.060	0.067	0.05	0.07	
	22-3.0ISO			22-3.0ISO		3.0	1/2	0.866	0.072	0.05	0.06	
	22-3.5ISO	●		22-3.5ISO		3.5	1/2	0.866	0.085	0.06	0.09	
	22-4.0ISO	●		22-4.0ISO	●	4.0	1/2	0.866	0.096	0.06	0.09	
	22-4.5ISO	●		22-4.5ISO		4.5	1/2	0.866	0.109	0.06	0.09	
	22-5.0ISO	●		22-5.0ISO		5.0	1/2	0.866	0.121	0.06	0.10	
	27-5.5ISO			27-5.5ISO		5.5	5/8	1.063	0.133	0.06	0.11	
	27-6.0ISO			27-6.0ISO		6.0	5/8	1.063	0.145	0.08	0.11	

Applicable holders D31

● : Stock item

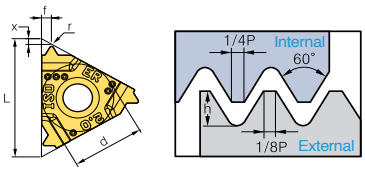
ISO Metric (M Chip Breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
External	ERM 16-1.0ISO	●				1.0	3/8	0.630	0.024	0.02	0.03	
	16-1.25ISO					1.25	3/8	0.630	0.030	0.03	0.04	
	16-1.5ISO	●				1.5	3/8	0.630	0.036	0.03	0.04	
	16-1.75ISO	●				1.75	3/8	0.630	0.042	0.04	0.05	
	16-2.0ISO	●				2.0	3/8	0.630	0.049	0.04	0.05	
	16-2.5ISO	●				2.5	3/8	0.630	0.060	0.04	0.05	
	16-3.0ISO	●				3.0	3/8	0.630	0.073	0.05	0.06	

Applicable holders D31

● : Stock item

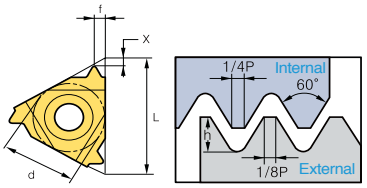
ISO Metric (U Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
External	ERM 16-1.5ISO-U					1.5	3/8	0.630	0.036	0.03	0.04	
	16-2.0ISO-U					2.0	3/8	0.630	0.049	0.04	0.05	

Applicable holders D31

● : Stock item

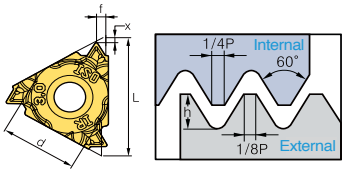
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
Internal	IR 11-0.35ISO			IL 11-0.35ISO		0.35	1/4	0.433	0.008	0.03	0.01	
	11-0.4ISO			11-0.4ISO		0.4	1/4	0.433	0.009	0.03	0.02	
	11-0.45ISO			11-0.45ISO		0.45	1/4	0.433	0.010	0.03	0.02	
	11-0.5ISO	●		11-0.5ISO		0.5	1/4	0.433	0.001	0.02	0.02	
	11-0.6ISO			11-0.6ISO		0.6	1/4	0.433	0.014	0.02	0.02	
	11-0.7ISO			11-0.7ISO		0.7	1/4	0.433	0.016	0.02	0.02	
	11-0.75ISO	●		11-0.75ISO		0.75	1/4	0.433	0.017	0.02	0.02	
	11-0.8ISO			11-0.8ISO		0.8	1/4	0.433	0.018	0.02	0.03	
	11-1.0ISO	●	●	11-1.0ISO		1.0	1/4	0.433	0.023	0.02	0.03	
	11-1.25ISO	●		11-1.25ISO		1.25	1/4	0.433	0.028	0.03	0.04	
	11-1.5ISO	●		11-1.5ISO	●	1.5	1/4	0.433	0.034	0.03	0.04	
	11-1.75ISO		●	11-1.75ISO		1.75	1/4	0.433	0.040	0.04	0.04	
	11-2.0ISO	●		11-2.0ISO	●	2.0	1/4	0.433	0.045	0.03	0.04	
	11-2.5ISO	●		11-2.5ISO		2.5	1/4	0.433	0.057	0.03	0.04	
	16-0.35ISO			16-0.35ISO		0.35	3/8	0.630	0.008	0.03	0.01	
	16-0.4ISO			16-0.4ISO		0.4	3/8	0.630	0.009	0.03	0.02	
	16-0.45ISO			16-0.45ISO		0.45	3/8	0.630	0.010	0.03	0.02	
	16-0.5ISO	●		16-0.5ISO		0.5	3/8	0.630	0.011	0.03	0.02	
	16-0.6ISO			16-0.6ISO		0.6	3/8	0.630	0.014	0.02	0.02	
	16-0.7ISO			16-0.7ISO		0.7	3/8	0.630	0.016	0.02	0.02	
	16-0.75ISO	●		16-0.75ISO		0.75	3/8	0.630	0.017	0.02	0.02	
	16-0.8ISO			16-0.8ISO		0.8	3/8	0.630	0.018	0.02	0.02	
	16-1.0ISO	●	●	16-1.0ISO		1.0	3/8	0.630	0.023	0.02	0.03	
	16-1.25ISO	●		16-1.25ISO		1.25	3/8	0.630	0.028	0.03	0.04	
	16-1.5ISO	●	●	16-1.5ISO		1.5	3/8	0.630	0.034	0.03	0.04	
	16-1.75ISO	●	●	16-1.75ISO		1.75	3/8	0.630	0.040	0.04	0.05	
	16-2.0ISO	●	●	16-2.0ISO	●	2.0	3/8	0.630	0.045	0.04	0.05	
	16-2.5ISO	●		16-2.5ISO		2.5	3/8	0.630	0.057	0.04	0.07	
	16-3.0ISO	●		16-3.0ISO	●	3.0	3/8	0.630	0.068	0.04	0.06	
	22-3.5ISO	●		22-3.5ISO		3.5	1/2	0.866	0.08	0.06	0.09	
	22-4.0ISO	●		22-4.0ISO		4.0	1/2	0.866	0.091	0.06	0.09	
	22-4.5ISO	●		22-4.5ISO		4.5	1/2	0.866	0.102	0.06	0.09	
	22-5.0ISO	●		22-5.0ISO		5.0	1/2	0.866	0.114	0.06	0.09	
	27-5.5ISO			27-5.5ISO		5.5	5/8	1.063	0.125	0.06	0.09	
	27-6.0ISO	●		27-6.0ISO		6.0	5/8	1.063	0.136	0.07	0.10	

Applicable holders D32

● : Stock item

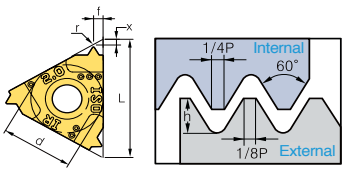
ISO Metric (M Chip Breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
Internal	IRM 11-1.5ISO	●				1.5	1/4	0.433	0.034	0.03	1.04	
	16-1.0ISO	●				1.0	3/8	0.630	0.023	0.02	0.03	
	16-1.25ISO					1.25	3/8	0.630	0.034	0.03	0.04	
	16-1.5ISO	●				1.5	3/8	0.630	0.028	0.03	1.04	
	16-1.75ISO					1.75	3/8	0.630	0.034	1.04	1.05	
	16-2.0ISO	●				2.0	3/8	0.630	0.045	1.04	1.05	
	16-2.5ISO	●				2.5	3/8	0.630	0.057	1.04	1.06	
	16-3.0ISO	●				3.0	3/8	0.630	0.068	1.04	1.06	

Applicable holders D32

● : Stock item

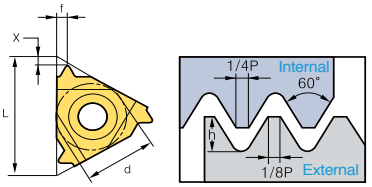
ISO Metric (U Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
Internal	IRM 16-1.5ISO-U					1.5	3/8	0.630	0.034	0.03	1.04	
	16-2.0ISO-U					2.0	3/8	0.630	0.045	1.04	1.05	

Applicable holders D32

● : Stock item

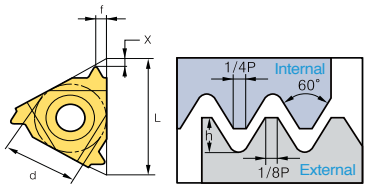
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-72UN			EL 11-72UN		72	1/4	0.433	0.009	1/32	0.016	
	11-64UN			11-64UN		64	1/4	0.433	0.009	1/32	0.016	
	11-56UN			11-56UN		56	1/4	0.433	0.011	0.028	0.016	
	11-48UN			11-48UN		48	1/4	0.433	0.013	0.024	0.024	
	11-44UN			11-44UN		44	1/4	0.433	0.014	0.024	0.024	
	11-40UN			11-40UN		40z	1/4	0.433	0.015	0.024	0.024	
	11-36UN			11-36UN		36	1/4	0.433	0.017	0.024	0.024	
	11-32UN			11-32UN		32	1/4	0.433	0.019	0.024	0.024	
	11-28UN			11-28UN		28	1/4	0.433	0.022	0.024	0.028	
	11-27UN			11-27UN		27	1/4	0.433	0.023	0.028	0.031	
	11-24UN			11-24UN		24	1/4	0.433	0.026	0.028	0.031	
	11-20UN			11-20UN		20	1/4	0.433	0.031	1/32	0.035	
	11-18UN			11-18UN		18	1/4	0.433	0.034	1/32	0.039	
	11-16UN			11-16UN		16	1/4	0.433	0.038	0.035	0.043	
	11-14UN			11-14UN		14	1/4	0.433	0.044	0.035	0.043	
	16-72UN			16-72UN		72	3/8	0.630	0.009	1/32	0.016	
	16-64UN			16-64UN		64	3/8	0.630	0.009	1/32	0.016	
	16-56UN			16-56UN		56	3/8	0.630	0.011	0.028	0.016	
	16-48UN			16-48UN		48	3/8	0.630	0.013	0.024	0.024	
	16-44UN			16-44UN		44	3/8	0.630	0.014	0.024	0.024	
	16-40UN			16-40UN		40	3/8	0.630	0.015	0.024	0.024	
	16-36UN			16-36UN		36	3/8	0.630	0.017	0.024	0.024	
	16-32UN	●		16-32UN		32	3/8	0.630	0.008	0.024	0.024	
	16-28UN			16-28UN		28	3/8	0.630	0.022	0.024	0.028	
	16-27UN			16-27UN		27	3/8	0.630	0.023	0.028	0.031	
	16-24UN	●		16-24UN		24	3/8	0.630	0.026	0.028	0.031	
	16-20UN	●		16-20UN		20	3/8	0.630	0.031	1/32	0.035	
	16-18UN	●	●	16-18UN		18	3/8	0.630	0.034	1/32	0.039	
	16-16UN	●	●	16-16UN		16	3/8	0.630	0.038	0.035	0.043	
	16-14UN	●		16-14UN		14	3/8	0.630	0.004	0.039	0.047	
	16-13UN			16-13UN		13	3/8	0.630	0.047	0.039	0.051	
	16-12UN	●		16-12UN		12	3/8	0.630	0.051	0.043	0.055	
	16-11.5UN			16-11.5UN		11.5	3/8	0.630	0.053	0.043	0.059	
	16-11UN	●		16-11UN		11	3/8	0.630	0.056	0.043	0.059	
	16-10UN	●		16-10UN		10	3/8	0.630	0.061	0.043	0.059	
	16-9UN	●		16-9UN		9	3/8	0.630	0.068	0.047	0.067	
	16-8UN	●		16-8UN		8	3/8	0.630	0.077	0.047	0.063	
	22-7UN			22-7UN		7	1/2	0.866	0.087	0.063	0.091	
	22-6UN			22-6UN		6	1/2	0.866	0.102	0.063	0.091	
	22-5UN			22-5UN		5	1/2	0.866	0.123	0.067	0.098	
	27-4.5UN			27-4.5UN		4.5	5/8	1.063	0.136	0.075	0.106	
	27-4UN			27-4UN		4	5/8	1.063	0.153	0.083	0.118	

Applicable holders D31

● : Stock item

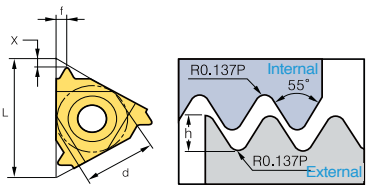
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
Internal	IR 11-72UN			IL 11-72UN		72	1/4	0.433	0.008	1/32	0.012	
	11-64UN			11-64UN		64	1/4	0.433	0.009	1/32	0.016	
	11-56UN			11-56UN		56	1/4	0.433	0.010	0.028	0.016	
	11-48UN			11-48UN		48	1/4	0.433	0.012	0.024	0.024	
	11-44UN			11-44UN		44	1/4	0.433	0.013	0.024	0.024	
	11-40UN			11-40UN		40	1/4	0.433	0.015	0.024	0.024	
	11-36UN			11-36UN		36	1/4	0.433	0.016	0.024	0.024	
	11-32UN			11-32UN		32	1/4	0.433	0.018	0.024	0.024	
	11-28UN			11-28UN		28	1/4	0.433	0.020	0.024	0.028	
	11-27UN			11-27UN		27	1/4	0.433	0.021	0.028	0.031	
	11-24UN			11-24UN		24	1/4	0.433	0.024	0.028	0.031	
	11-20UN		●	11-20UN		20	1/4	0.433	0.029	1/32	0.035	
	11-18UN	●		11-18UN		18	1/4	0.433	0.032	1/32	0.039	
	11-16UN		●	11-16UN		16	1/4	0.433	0.036	0.035	0.043	
	11-14UN			11-14UN		14	1/4	0.433	0.041	0.035	0.043	
	11-12UN			11-12UN		12	1/4	0.433	0.048	1/32	0.043	
	11-11UN	●		11-11UN		11	1/4	0.433	0.052	1/32	0.043	
	16-72UN			16-72UN		72	3/8	0.630	0.008	1/32	0.012	
	16-64UN			16-64UN		64	3/8	0.630	0.009	1/32	0.016	
	16-56UN			16-56UN		56	3/8	0.630	0.010	0.028	0.016	
	16-48UN			16-48UN		48	3/8	0.630	0.012	0.024	0.024	
	16-44UN			16-44UN		44	3/8	0.630	0.013	0.024	0.024	
	16-40UN			16-40UN		40	3/8	0.630	0.015	0.024	0.024	
	16-36UN			16-36UN		36	3/8	0.630	0.016	0.024	0.024	
	16-32UN			16-32UN		32	3/8	0.630	0.020	0.024	0.024	
	16-28UN			16-28UN		28	3/8	0.630	0.020	0.024	0.028	
	16-27UN			16-27UN		27	3/8	0.630	0.021	0.028	0.031	
	16-24UN			16-24UN		24	3/8	0.630	0.024	0.028	0.031	
	16-20UN	●		16-20UN		20	3/8	0.630	0.029	1/32	0.035	
	16-18UN			16-18UN		18	3/8	0.630	0.032	1/32	0.039	
	16-16UN	●		16-16UN		16	3/8	0.630	0.036	0.035	0.043	
	16-14UN	●		16-14UN		14	3/8	0.630	0.041	0.035	0.047	
	16-13UN			16-13UN		13	3/8	0.630	0.044	0.039	0.051	
	16-12UN	●		16-12UN		12	3/8	0.630	0.048	0.043	0.055	
	16-11.5UN			16-11.5UN		11.5	3/8	0.630	0.050	0.043	0.059	
	16-11UN	●		16-11UN		11	3/8	0.630	0.052	0.043	0.059	
	16-10UN	●		16-10UN		10	3/8	0.630	0.058	0.043	0.059	
	16-9UN			16-9UN		9	3/8	0.630	0.064	0.047	0.067	
	16-8UN	●		16-8UN		8	3/8	0.630	0.072	0.043	0.059	
	22-7UN			22-7UN		7	1/2	0.866	0.082	0.063	0.091	
	22-6UN			22-6UN		6	1/2	0.866	0.096	0.063	0.091	
	22-5UN			22-5UN		5	1/2	0.866	0.115	0.063	0.091	
	27-4.5UN			27-4.5UN		4.5	5/8	1.063	0.128	0.067	0.094	
	27-4UN			27-4UN		4	5/8	1.063	0.144	0.071	0.106	

Applicable holders D32

● : Stock item

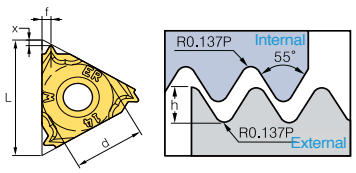
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER **11-72W**			EL **11-72W**		72	1/4	0.433	0.009	0.028	0.016	
	11-60W			**11-60W**		60	1/4	0.433	0.011	0.028	0.016	
	11-56W			**11-56W**		56	1/4	0.433	0.011	0.028	0.016	
	11-48W			**11-48W**		48	1/4	0.433	0.013	0.024	0.024	
	11-40W			**11-40W**		40	1/4	0.433	0.016	0.024	0.024	
	11-36W			**11-36W**		36	1/4	0.433	0.018	0.024	0.024	
	11-32W			**11-32W**		32	1/4	0.433	0.020	0.024	0.024	
	11-28W			**11-28W**		28	1/4	0.433	0.023	0.024	0.028	
	11-26W			**11-26W**		26	1/4	0.433	0.025	0.028	0.031	
	11-24W			**11-24W**		24	1/4	0.433	0.027	0.028	0.031	
	11-22W			**11-22W**		22	1/4	0.433	0.029	1/32	0.035	
	11-20W			**11-20W**		20	1/4	0.433	0.032	1/32	0.035	
	11-19W			**11-19W**		19	1/4	0.433	0.034	1/32	0.039	
	11-18W			**11-18W**		18	1/4	0.433	0.035	1/32	0.039	
	11-16W			**11-16W**		16	1/4	0.433	0.040	0.035	0.043	
	11-14W			**11-14W**		14	1/4	0.433	0.046	0.039	0.047	
	16-72W			**16-72W**		72	3/8	0.630	0.009	0.028	0.016	
	16-60W			**16-60W**		60	3/8	0.630	0.011	0.028	0.016	
	16-56W			**16-56W**		56	3/8	0.630	0.011	0.028	0.016	
	16-48W			**16-48W**		48	3/8	0.630	0.013	0.024	0.024	
	16-40W			**16-40W**		40	3/8	0.630	0.016	0.024	0.024	
	16-36W			**16-36W**		36	3/8	0.630	0.018	0.024	0.024	
	16-32W			**16-32W**		32	3/8	0.630	0.020	0.024	0.024	
	16-30W			**16-30W**		30	3/8	0.630	0.022	0.024	0.028	
	16-28W	●		**16-28W**		28	3/8	0.630	0.023	0.024	0.028	
	16-26W			**16-26W**		26	3/8	0.630	0.025	0.028	0.031	
	16-24W			**16-24W**		24	3/8	0.630	0.027	0.028	0.031	
	16-22W			**16-22W**		22	3/8	0.630	0.029	1/32	0.035	
	16-20W			**16-20W**		20	3/8	0.630	0.032	1/32	0.035	
	16-19W	●	●	**16-19W**		19	3/8	0.630	0.034	1/32	0.039	
	16-18W	●		**16-18W**		18	3/8	0.630	0.035	1/32	0.039	
	16-16W	●		**16-16W**		16	3/8	0.630	0.040	0.035	0.043	
	16-14W	●	●	**16-14W**		14	3/8	0.630	0.046	0.039	0.047	
	16-12W	●		**16-12W**		12	3/8	0.630	0.054	0.043	0.055	
	16-11W	●		**16-11W**		11	3/8	0.630	0.058	0.043	0.059	
	16-10W	●		**16-10W**		10	3/8	0.630	0.064	0.043	0.059	
	16-9W			**16-9W**		9	3/8	0.630	0.071	0.047	0.067	
	16-8W	●		**16-8W**		8	3/8	0.630	0.080	0.047	0.059	
	22-7W			**22-7W**		7	1/2	0.866	0.131	0.063	0.091	
	22-6W			**22-6W**		6	1/2	0.866	0.107	0.063	0.091	
	22-5W			**22-5W**		5	1/2	0.866	0.128	0.067	0.094	
	27-4.5W			**27-4.5W**		4.5	5/8	1.063	0.142	0.071	0.102	
	27-4W			**27-4W**		4	5/8	1.063	0.160	0.079	0.114	

Applicable holders **D31**

● : Stock item

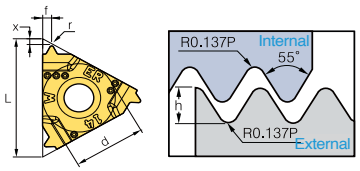
Whitworth (M Chip Breaker) Neu

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ERM **16-14W**	●				14	3/8	0.630	0.046	0.039	0.047	
	16-11W	●				11	3/8	0.630	0.058	0.043	0.059	
	16-19W	●				19	3/8	0.630	0.034	1/32	0.039	

Applicable holders D31

● : Stock item

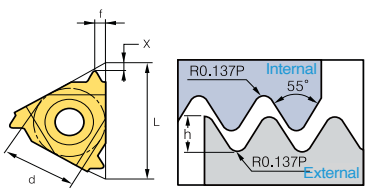
Whitworth (U Chip Breaker) Neu

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ERM **16-14W-U**					14	3/8	0.630	0.046	0.039	0.047	
	16-11W-U					11	3/8	0.630	0.058	0.043	0.059	

Applicable holders D31

● : Stock item

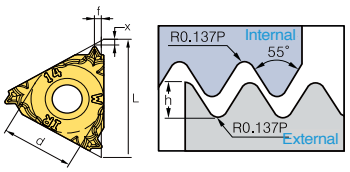
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
Internal	IR 11-72W			IL 11-72W		72	1/4	0.433	0.009	0.028	0.016	
	11-60W			11-60W		60	1/4	0.433	0.011	0.028	0.016	
	11-56W			11-56W		56	1/4	0.433	0.011	0.028	0.016	
	11-48W			11-48W		48	1/4	0.433	0.013	0.024	0.024	
	11-40W			11-40W		40	1/4	0.433	0.016	0.024	0.024	
	11-36W			11-36W		36	1/4	0.433	0.018	0.024	0.024	
	11-32W			11-32W		32	1/4	0.433	0.02	0.024	0.024	
	11-28W			11-28W		28	1/4	0.433	0.023	0.024	0.028	
	11-26W			11-26W		26	1/4	0.433	0.025	0.028	0.031	
	11-24W			11-24W		24	1/4	0.433	0.027	0.028	0.031	
	11-22W			11-22W		22	1/4	0.433	0.029	1/32	0.035	
	11-20W			11-20W		20	1/4	0.433	0.032	1/32	0.035	
	11-19W	●	●	11-19W		19	1/4	0.433	0.034	1/32	0.039	
	11-18W			11-18W		18	1/4	0.433	0.035	1/32	0.039	
	11-16W			11-16W		16	1/4	0.433	0.04	0.035	0.043	
	11-14W	●		11-14W		14	1/4	0.433	0.046	0.035	0.043	
	11-12W			11-12W		12	1/4	0.433	0.052	0.035	0.047	
	16-72W			16-72W		72	3/8	0.63	0.009	0.028	0.016	
	16-60W			16-60W		60	3/8	0.63	0.011	0.028	0.016	
	16-56W			16-56W		56	3/8	0.63	0.011	0.028	0.016	
	16-48W			16-48W		48	3/8	0.63	0.013	0.024	0.024	
	16-40W			16-40W		40	3/8	0.63	0.016	0.024	0.024	
	16-36W			16-36W		36	3/8	0.63	0.018	0.024	0.024	
	16-32W			16-32W		32	3/8	0.63	0.02	0.024	0.024	
	16-30W			16-30W		30	3/8	0.63	0.022	0.024	0.028	
	16-28W			16-28W		28	3/8	0.63	0.023	0.024	0.028	
	16-26W			16-26W		26	3/8	0.63	0.025	0.028	0.031	
	16-24W			16-24W		24	3/8	0.63	0.027	0.028	0.031	
	16-22W			16-22W		22	3/8	0.63	0.029	1/32	0.035	
	16-20W			16-20W		20	3/8	0.63	0.032	1/32	0.035	
	16-19W			16-19W		19	3/8	0.63	0.034	1/32	0.039	
	16-18W			16-18W		18	3/8	0.63	0.035	1/32	0.039	
	16-16W			16-16W		16	3/8	0.63	0.04	0.035	0.043	
	16-14W	●	●	16-14W		14	3/8	0.63	0.046	0.039	0.047	
	16-12W	●		16-12W		12	3/8	0.63	0.054	0.043	0.055	
	16-11W	●		16-11W		11	3/8	0.63	0.058	0.043	0.059	
	16-10W	●		16-10W		10	3/8	0.63	0.064	0.043	0.059	
	16-9W	●		16-9W		9	3/8	0.63	0.071	0.047	0.067	
	16-8W	●		16-8W		8	3/8	0.63	0.08	0.047	0.056	
	22-7W			22-7W		7	1/2	0.866	0.131	0.063	0.097	
	22-6W			22-6W		6	1/2	0.866	0.107	0.063	0.097	
	22-5W			22-5W		5	1/2	0.866	0.128	0.067	0.094	
	27-4.5W			27-4.5W		4.5	5/8	1.063	0.142	0.071	0.102	
	27-4W			27-4W		4	5/8	1.063	0.16	0.079	0.114	

Applicable holders D32

● : Stock item

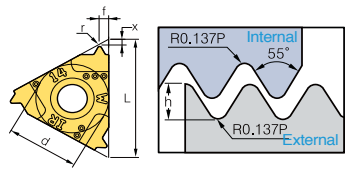
Whitworth (M Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
Internal	IRM 16-14W					14	3/8	0.630	0.046	0.039	0.047	
	16-11W	●				11	3/8	0.630	0.058	0.043	0.059	

Applicable holders D32

● : Stock item

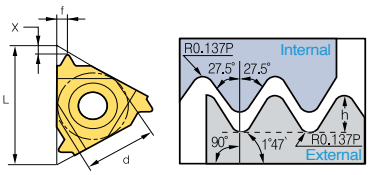
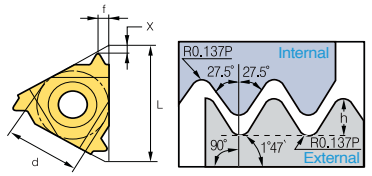
Whitworth (U Chip Breaker) New

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
Internal	IRM 16-14W-U					14	3/8	0.630	0.046	0.039	0.047	
	16-11W-U					11	3/8	0.630	0.058	0.043	0.059	

Applicable holders D32

● : Stock item

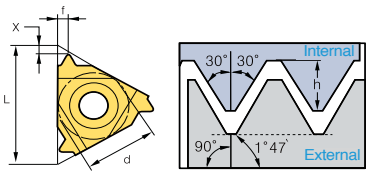
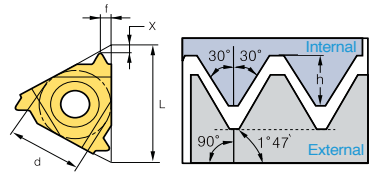
British Standard Pipe Thread (BSPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-28BSPT			EL 11-28BSPT		28	1/4	0.43	0.023	0.02	0.02	
	11-19BSPT			11-19BSPT		19	1/4	0.43	0.034	0.04	0.04	
	11-14BSPT			11-14BSPT		14	1/4	0.43	0.046	0.04	0.04	
	16-28BSPT			16-28BSPT		28	3/8	0.63	0.023	0.02	0.02	
	16-19BSPT		●	16-19BSPT		19	3/8	0.63	0.034	0.04	0.04	
	16-14BSPT		●	16-14BSPT		14	3/8	0.63	0.046	0.05	0.05	
	16-11BSPT	●		16-11BSPT		11	3/8	0.63	0.056	0.06	0.06	
Internal	IR 11-28BSPT			IL 11-28BSPT		28	1/4	0.43	0.023	0.02	0.02	
	11-19BSPT			11-19BSPT		19	1/4	0.43	0.034	0.03	0.04	
	11-14BSPT			11-14BSPT		14	1/4	0.43	0.046	0.04	0.04	
	16-28BSPT			16-28BSPT		28	3/8	0.63	0.023	0.02	0.02	
	16-19BSPT	●	●	16-19BSPT		19	3/8	0.63	0.034	0.03	0.04	
	16-14BSPT	●	●	16-14BSPT		14	3/8	0.63	0.046	0.04	0.05	
	16-11BSPT			16-11BSPT		11	3/8	0.63	0.058	0.04	0.06	

Applicable holders D31, D32

● : Stock item

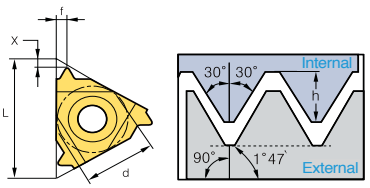
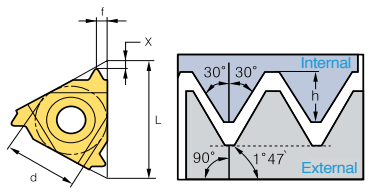
National Pipe Thread (NPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-27NPT			EL 11-27NPT		27	1/4	0.43	0.026	0.03	0.03	
	11-18NPT			11-18NPT		18	1/4	0.43	0.040	0.03	0.04	
	11-14NPT			11-14NPT		14	1/4	0.43	0.052	0.03	0.04	
	16-27NPT			16-27NPT		27	3/8	0.63	0.026	0.03	0.03	
	16-18NPT	●	●	16-18NPT		18	3/8	0.63	0.040	0.03	0.04	
	16-14NPT	●	●	16-14NPT		14	3/8	0.63	0.052	0.04	0.05	
	16-11.5NPT	●		16-11.5NPT		11.5	3/8	0.63	0.065	0.04	0.06	
	16-8NPT	●		16-8NPT		8	3/8	0.63	0.095	0.05	0.07	
Internal	IR 11-27NPT			IL 11-27NPT		27	1/4	0.43	0.026	0.03	0.03	
	11-18NPT	●		11-18NPT		18	1/4	0.43	0.040	0.03	0.04	
	11-14NPT	●	●	11-14NPT		14	1/4	0.43	0.052	0.03	0.04	
	16-27NPT			16-27NPT		27	3/8	0.63	0.026	0.03	0.03	
	16-18NPT			16-18NPT		18	3/8	0.63	0.040	0.03	0.04	
	16-14NPT	●	●	16-14NPT		14	3/8	0.63	0.052	0.04	0.05	
	16-11.5NPT	●	●	16-11.5NPT		11.5	3/8	0.63	0.065	0.04	0.06	
	16-8NPT	●		16-8NPT		8	3/8	0.63	0.095	0.05	0.06	

Applicable holders D31, D32

● : Stock item

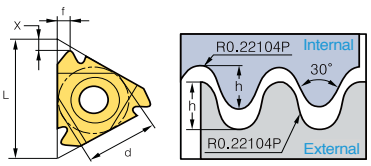
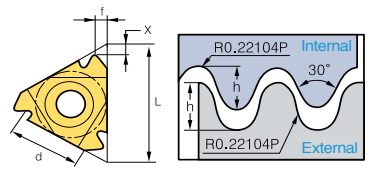
National Pipe Threads-Dryseal (NPTF)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-27NPTF		EL 11-27NPT		27	1/4	0.43	0.025	0.03	0.03	
	11-18NPTF		11-18NPT		18	1/4	0.43	0.039	0.03	0.04	
	11-14NPTF		11-14NPT		14	1/4	0.43	0.053	0.03	0.04	
	16-27NPTF		16-27NPT		27	3/8	0.63	0.025	0.03	0.03	
	16-18NPTF	●	16-18NPT		18	3/8	0.63	0.039	0.03	0.04	
	16-14NPTF		16-14NPT		14	3/8	0.63	0.053	0.04	0.05	
	16-11.5NPTF		16-11.5NPT		11.5	3/8	0.63	0.064	0.04	0.06	
	16-8NPTF		16-8NPT		8	3/8	0.63	0.094	0.05	0.07	
Internal	IR 11-27NPTF		IL 11-27NPT		27	1/4	0.43	0.025	0.03	0.03	
	11-18NPTF		11-18NPT		18	1/4	0.43	0.039	0.03	0.04	
	11-14NPTF		11-14NPT		14	1/4	0.43	0.053	0.03	0.04	
	16-27NPTF		16-27NPT		27	3/8	0.63	0.025	0.03	0.03	
	16-18NPTF		16-18NPT		18	3/8	0.63	0.039	0.03	0.04	
	16-14NPTF		16-14NPT		14	3/8	0.63	0.053	0.04	0.05	
	16-11.5NPTF		16-11.5NPT		11.5	3/8	0.63	0.064	0.04	0.06	
	16-8NPTF		16-8NPT		8	3/8	0.63	0.094	0.05	0.07	

Applicable holders D31, D32

● : Stock item

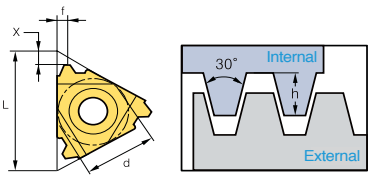
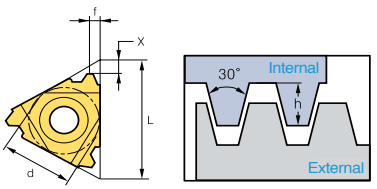
Round DIN 405

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 16-10RD		EL 16-10RD		10	3/8	0.63	0.050	0.04	0.05	
	16-8RD		16-8RD		8	3/8	0.63	0.063	0.06	0.05	
	16-6RD		16-6RD		6	3/8	0.63	0.083	0.06	0.07	
	22-6RD		22-6RD		6	1/2	0.87	0.083	0.06	0.07	
	22-4RD		22-4RD		4	1/2	0.87	0.125	0.09	0.09	
	27-4RD		27-4RD		4	5/8	1.06	0.125	0.09	0.09	
Internal	IR 16-10RD		IL 16-10RD		10	3/8	0.63	0.050	0.04	0.05	
	16-8RD		16-8RD		8	3/8	0.63	0.063	0.06	0.05	
	16-6RD		16-6RD		6	3/8	0.63	0.083	0.06	0.07	
	22-6RD		22-6RD		6	1/2	0.87	0.083	0.06	0.07	
	22-4RD		22-4RD		4	1/2	0.87	0.125	0.09	0.09	
	27-4RD		27-4RD		4	5/8	1.06	0.125	0.09	0.09	

Applicable holders D31, D32

● : Stock item

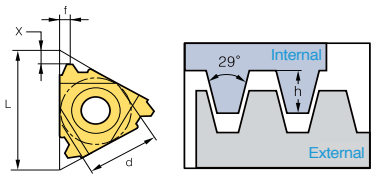
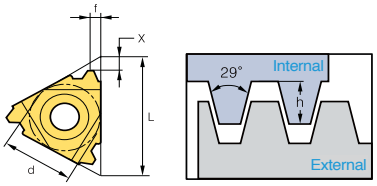
Trapez DIN 103 (TR)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-1.5TR		EL 11-1.5TR		1.5	1/4	0.43	0.035	0.03	0.04	
	16-1.5TR		16-1.5TR		1.5	3/8	0.63	0.035	0.04	0.04	
	16-2.0TR	●	16-2.0TR	●	2.0	3/8	0.63	0.049	0.04	0.05	
	16-3.0TR	●	16-3.0TR		3.0	3/8	0.63	0.069	0.05	0.06	
	22-4.0TR	●	22-4.0TR	●	4.0	1/2	0.87	0.089	0.07	0.07	
	22-5.0TR	●	22-5.0TR	●	5.0	1/2	0.87	0.108	0.08	0.10	
	27-6.0TR	●	27-6.0TR		6.0	5/8	1.06	0.138	0.09	0.11	
Internal	IR 11-1.5TR		IL 11-1.5TR		1.5	1/4	0.43	0.035	0.03	0.04	
	16-1.5TR		16-1.5TR		1.5	3/8	0.63	0.035	0.04	0.04	
	16-2.0TR		16-2.0TR		2.0	3/8	0.63	0.049	0.04	0.05	
	16-2.5TR		16-2.5TR		2.5	3/8	0.63	0.060	0.05	0.06	
	16-3.0TR	●	16-3.0TR		3.0	3/8	0.63	0.069	0.05	0.06	
	22-4.0TR	●	22-4.0TR		4.0	1/2	0.87	0.089	0.07	0.07	
	22-5.0TR	●	22-5.0TR		5.0	1/2	0.87	0.108	0.08	0.10	
	27-6.0TR	●	27-6.0TR		6.0	5/8	1.06	0.138	0.09	0.11	

Applicable holders D31, D32

● : Stock item

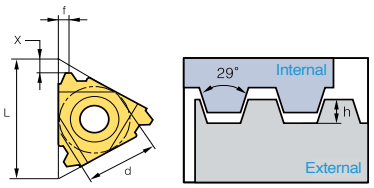
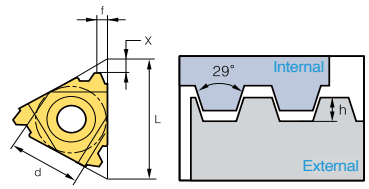
American ACME (ACME)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-16ACME		EL 11-16ACME		16	1/4	0.43	0.036	0.04	0.04	
	16-16ACME		16-16ACME		16	3/8	0.63	0.036	0.04	0.04	
	16-14ACME		16-14ACME		14	3/8	0.63	0.041	0.04	0.05	
	16-12ACME		16-12ACME		12	3/8	0.63	0.047	0.04	0.05	
	16-10ACME		16-10ACME		10	3/8	0.63	0.06	0.05	0.06	
	16-8ACME		16-8ACME		8	3/8	0.63	0.072	0.06	0.06	
	16-6ACME		16-6ACME		6	3/8	0.63	0.093	0.07	0.07	
	22-6ACME	●	22-6ACME		6	1/2	0.87	0.093	0.07	0.08	
	22-5ACME		22-5ACME		5	1/2	0.87	0.11	0.08	0.09	
	27-4ACME		27-4ACME		4	5/8	1.06	0.135	0.09	0.11	
Internal	IR 11-16ACME		IL 11-16ACME		16	1/4	0.43	0.036	0.04	0.04	
	16-16ACME		16-16ACME		16	3/8	0.63	0.036	0.04	0.04	
	16-14ACME		16-14ACME		14	3/8	0.63	0.041	0.04	0.05	
	16-12ACME		16-12ACME		12	3/8	0.63	0.047	0.05	0.05	
	16-10ACME		16-10ACME		10	3/8	0.63	0.06	0.05	0.05	
	16-8ACME		16-8ACME		8	3/8	0.63	0.072	0.06	0.06	
	16-6ACME		16-6ACME		6	3/8	0.63	0.093	0.07	0.07	
	22-6ACME		22-6ACME		6	1/2	0.87	0.093	0.07	0.08	
	22-5ACME		22-5ACME		5	1/2	0.87	0.11	0.08	0.09	
	27-4ACME	●	27-4ACME		4	5/8	1.06	0.135	0.09	0.10	

Applicable holders D31, D32

● : Stock item

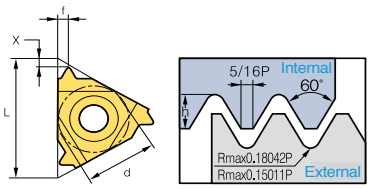
Stub ACME (STACME)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-16STACME		EL 11-16STACME		16	1/4	0.43	0.024	0.04	0.04	
	16-16STACME		16-16STACME		16	3/8	0.63	0.024	0.04	0.04	
	16-14STACME		16-14STACME		14	3/8	0.63	0.026	0.04	0.04	
	16-12STACME		16-12STACME		12	3/8	0.63	0.03	0.05	0.05	
	16-10STACME		16-10STACME		10	3/8	0.63	0.04	0.05	0.05	
	16-8STACME		16-8STACME		8	3/8	0.63	0.048	0.06	0.06	
	16-6STACME		16-6STACME		6	3/8	0.63	0.06	0.07	0.07	
	22-6STACME		22-6STACME		6	1/2	0.78	0.06	0.07	0.07	
	22-5STACME		22-5STACME		5	1/2	0.78	0.07	0.08	0.08	
	27-4STACME		27-4STACME		4	5/8	1.06	0.085	0.09	0.09	
	27-3STACME		27-3STACME		3	5/8	0.43	0.11	0.11	0.11	
Internal	IR 11-16STACME		IL 11-16STACME		16	1/4	0.63	0.024	0.04	0.04	
	16-16STACME		16-16STACME		16	3/8	0.63	0.024	0.04	0.04	
	16-14STACME		16-14STACME		14	3/8	0.63	0.026	0.04	0.04	
	16-12STACME		16-12STACME		12	3/8	0.63	0.03	0.04	0.05	
	16-10STACME		16-10STACME		10	3/8	0.63	0.04	0.05	0.05	
	16-8STACME		16-8STACME		8	3/8	0.63	0.048	0.06	0.06	
	16-6STACME		16-6STACME		6	3/8	0.87	0.06	0.07	0.07	
	22-6STACME		22-6STACME		6	1/2	0.87	0.06	0.07	0.07	
	22-5STACME		22-5STACME		5	1/2	0.87	0.07	0.08	0.09	
	27-4STACME		27-4STACME		4	5/8	1.06	0.085	0.09	0.09	
	27-3STACME		27-3STACME		3	5/8	1.06	0.11	0.11	0.11	

Applicable holders D31, D32

● : Stock item

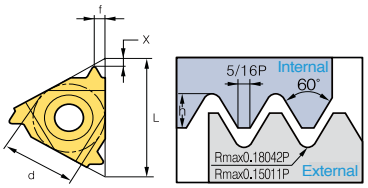
UNJ (Unified Constant Thread)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-48UNJ		EL 11-48UNJ		48	1/4	0.43	0.012	0.02	0.02	
	11-44UNJ		11-44UNJ		44	1/4	0.43	0.013	0.02	0.02	
	11-40UNJ		11-40UNJ		40	1/4	0.43	0.015	0.02	0.02	
	11-36UNJ		11-36UNJ		36	1/4	0.43	0.016	0.02	0.02	
	11-32UNJ		11-32UNJ		32	1/4	0.43	0.018	0.02	0.03	
	11-28UNJ		11-28UNJ		28	1/4	0.43	0.02	0.03	0.03	
	11-24UNJ		11-24UNJ		24	1/4	0.43	0.024	0.03	0.03	
	11-20UNJ		11-20UNJ		20	1/4	0.43	0.029	0.03	0.04	
	11-18UNJ		11-18UNJ		18	1/4	0.43	0.032	0.03	0.04	
	11-16UNJ		11-16UNJ		16	1/4	0.43	0.036	0.04	0.04	
	11-14UNJ		11-14UNJ		14	1/4	0.43	0.041	0.04	0.05	
	16-48UNJ		16-48UNJ		48	3/8	0.63	0.012	0.02	0.02	
	16-44UNJ		16-44UNJ		44	3/8	0.63	0.013	0.02	0.02	
	16-40UNJ		16-40UNJ		40	3/8	0.63	0.015	0.02	0.02	
	16-36UNJ		16-36UNJ		36	3/8	0.63	0.016	0.02	0.02	
	16-32UNJ		16-32UNJ		32	3/8	0.63	0.018	0.02	0.03	
	16-28UNJ		16-28UNJ		28	3/8	0.63	0.02	0.03	0.03	
	16-24UNJ		16-24UNJ		24	3/8	0.63	0.024	0.03	0.03	
	16-20UNJ		16-20UNJ		20	3/8	0.63	0.029	0.03	0.04	
	16-18UNJ		16-18UNJ		18	3/8	0.63	0.032	0.03	0.04	
	16-16UNJ		16-16UNJ		16	3/8	0.63	0.036	0.04	0.04	
	16-14UNJ		16-14UNJ		14	3/8	0.63	0.041	0.04	0.05	
	16-13UNJ		16-13UNJ		13	3/8	0.63	0.044	0.04	0.05	
	16-12UNJ		16-12UNJ		12	3/8	0.63	0.048	0.04	0.05	
	16-11UNJ		16-11UNJ		11	3/8	0.63	0.052	0.05	0.06	
	16-10UNJ		16-10UNJ		10	3/8	0.63	0.058	0.05	0.06	
	16-9UNJ		16-9UNJ		9	3/8	0.63	0.064	0.05	0.07	
	16-8UNJ		16-8UNJ		8	3/8	0.63	0.072	0.05	0.06	
	22-7UNJ		22-7UNJ		7	1/2	0.87	0.082	0.07	0.09	
	22-6UNJ		22-6UNJ		6	1/2	0.87	0.096	0.07	0.09	
	22-5UNJ		22-5UNJ		5	1/2	0.87	0.115	0.07	0.10	
	27-4.5UNJ		27-4.5UNJ		4.5	5/8	1.06	0.128	0.08	0.11	
	27-4UNJ		27-4UNJ		4	5/8	1.06	0.144	0.09	0.12	

Applicable holders D31

● : Stock item

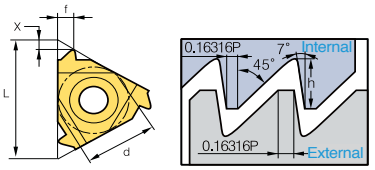
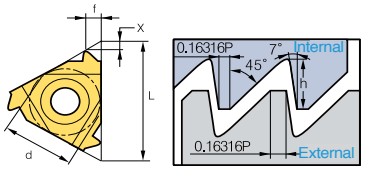
UNJ (Unified Constant Thread)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions					Picture
						d	L	hmin	X	f	
Internal	IR 11-48UNJ		IL 11-48UNJ		48	1/4	0.43	0.012	0.02	0.02	
	11-44UNJ		11-44UNJ		44	1/4	0.43	0.013	0.02	0.02	
	11-40UNJ		11-40UNJ		40	1/4	0.43	0.015	0.02	0.02	
	11-36UNJ		11-36UNJ		36	1/4	0.43	0.016	0.02	0.02	
	11-32UNJ		11-32UNJ		32	1/4	0.43	0.018	0.02	0.03	
	11-28UNJ		11-28UNJ		28	1/4	0.43	0.020	0.03	0.03	
	11-24UNJ		11-24UNJ		24	1/4	0.43	0.024	0.03	0.03	
	11-20UNJ		11-20UNJ		20	1/4	0.43	0.029	0.03	0.04	
	11-18UNJ		11-18UNJ		18	1/4	0.43	0.032	0.03	0.04	
	11-16UNJ		11-16UNJ		16	1/4	0.43	0.036	0.04	0.04	
	11-14UNJ		11-14UNJ		14	1/4	0.43	0.041	0.04	0.05	
	16-48UNJ		16-48UNJ		48	3/8	0.63	0.012	0.02	0.02	
	16-44UNJ		16-44UNJ		44	3/8	0.63	0.013	0.02	0.02	
	16-40UNJ		16-40UNJ		40	3/8	0.63	0.015	0.02	0.02	
	16-36UNJ		16-36UNJ		36	3/8	0.63	0.016	0.02	0.02	
	16-32UNJ		16-32UNJ		32	3/8	0.63	0.018	0.02	0.03	
	16-28UNJ		16-28UNJ		28	3/8	0.63	0.020	0.03	0.03	
	16-24UNJ		16-24UNJ		24	3/8	0.63	0.024	0.03	0.03	
	16-20UNJ		16-20UNJ		20	3/8	0.63	0.029	0.03	0.04	
	16-18UNJ		16-18UNJ		18	3/8	0.63	0.032	0.03	0.04	
	16-16UNJ		16-16UNJ		16	3/8	0.63	0.036	0.04	0.04	
	16-14UNJ		16-14UNJ		14	3/8	0.63	0.041	0.04	0.05	
	16-13UNJ		16-13UNJ		13	3/8	0.63	0.044	0.04	0.05	
	16-12UNJ		16-12UNJ		12	3/8	0.63	0.048	0.04	0.05	
	16-11UNJ		16-11UNJ		11	3/8	0.63	0.052	0.05	0.06	
	16-10UNJ		16-10UNJ		10	3/8	0.63	0.058	0.05	0.06	
	16-9UNJ		16-9UNJ		9	3/8	0.63	0.064	0.05	0.07	
	16-8UNJ		16-8UNJ		8	3/8	0.63	0.072	0.05	0.06	
	22-7UNJ		22-7UNJ		7	1/2	0.87	0.082	0.07	0.09	
	22-6UNJ		22-6UNJ		6	1/2	0.87	0.096	0.07	0.09	
	22-5UNJ		22-5UNJ		5	1/2	0.87	0.115	0.07	0.10	
	27-4.5UNJ		27-4.5UNJ		4.5	5/8	1.06	0.128	0.08	0.11	
	27-4UNJ		27-4UNJ		4	5/8	1.06	0.144	0.09	0.12	

Applicable holders D32

● : Stock item

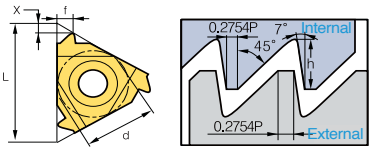
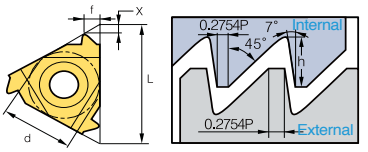
American Buttress (ABUT)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 11-20ABUT		EL 11-20ABUT		20	1/4	0.43	0.033	0.04	0.06	
	11-16ABUT		11-16ABUT		16	1/4	0.43	0.041	0.05	0.07	
	16-20ABUT		16-20ABUT		20	3/8	0.63	0.033	0.04	0.06	
	16-16ABUT		16-16ABUT		16	3/8	0.63	0.041	0.05	0.07	
	16-12ABUT		16-12ABUT		12	3/8	0.63	0.055	0.06	0.08	
	16-10ABUT		16-10ABUT		10	3/8	0.63	0.066	0.06	0.09	
	22-8ABUT		22-8ABUT		8	1/2	0.87	0.083	0.08	0.13	
	22-6ABUT		22-6ABUT		6	1/2	0.87	0.110	0.09	0.14	
Internal	IR 11-20ABUT		IL 11-20ABUT		20	1/4	0.43	0.033	0.04	0.06	
	11-16ABUT		11-16ABUT		16	1/4	0.43	0.041	0.05	0.07	
	16-20ABUT		16-20ABUT		20	3/8	0.63	0.033	0.04	0.06	
	16-16ABUT		16-16ABUT		16	3/8	0.63	0.041	0.05	0.07	
	16-12ABUT		16-12ABUT		12	3/8	0.63	0.055	0.06	0.08	
	16-10ABUT		16-10ABUT		10	3/8	0.63	0.066	0.06	0.09	
	22-8ABUT		22-8ABUT		8	1/2	0.87	0.083	0.08	0.13	
	22-6ABUT		22-6ABUT		6	1/2	0.87	0.110	0.09	0.14	

Applicable holders D31, D32

● : Stock item

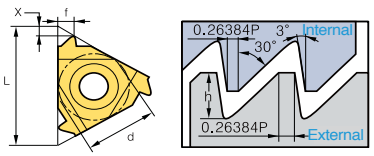
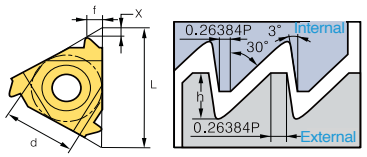
British Buttress (BBUT)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 16-16BBUT		EL 16-16BBUT		16	3/8	0.63	0.032	0.04	0.06	
	16-12BBUT		16-12BBUT		12	3/8	0.63	0.042	0.06	0.08	
	16-10BBUT		16-10BBUT		10	3/8	0.63	0.050	0.06	0.09	
	16-8BBUT		16-8BBUT		8	3/8	0.63	0.063	0.06	0.10	
	22-8BBUT		22-8BBUT		8	1/2	0.87	0.063	0.06	0.10	
Internal	IR 16-16BBUT		IL 16-16BBUT		16	3/8	0.63	0.032	0.04	0.06	
	16-12BBUT		16-12BBUT		12	3/8	0.63	0.042	0.06	0.08	
	16-10BBUT		16-10BBUT		10	3/8	0.63	0.050	0.06	0.09	
	16-8BBUT		16-8BBUT		8	3/8	0.63	0.063	0.06	0.10	
	22-8BBUT		22-8BBUT		8	1/2	0.87	0.063	0.06	0.10	

Applicable holders D31, D32

● : Stock item

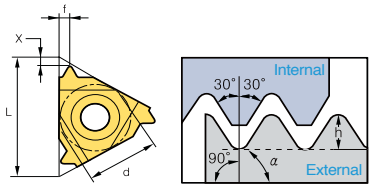
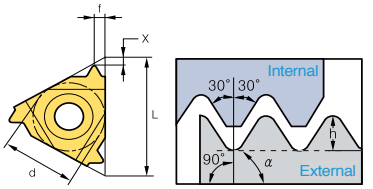
Metric Buttress (SAGE)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (mm)	Dimensions d	L	hmin	X	f	Picture
External	ER 16-2.0SAGE		EL 16-2.0SAGE		2.0	3/8	0.63	0.069	0.06	0.08	
	22-2.0SAGE		22-2.0SAGE		2.0	1/2	0.87	0.069	0.06	0.08	
	22-3.0SAGE	●	22-3.0SAGE		3.0	1/2	0.87	0.102	0.07	0.10	
	27-4.0SAGE		27-4.0SAGE		4.0	5/8	1.06	0.140	0.08	0.13	
Internal	IR 16-2.0SAGE		IL 16-2.0SAGE		2.0	3/8	0.63	0.059	0.06	0.09	
	22-3.0SAGE		22-3.0SAGE		3.0	1/2	0.87	0.089	0.07	0.11	
	27-4.0SAGE		27-4.0SAGE		4.0	5/8	1.06	0.122	0.08	0.13	

Applicable holders D31, D32

● : Stock item

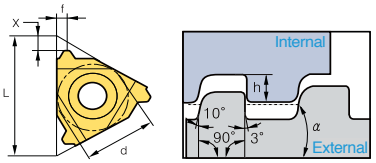
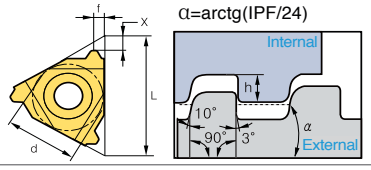
API

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions d	L	hmin	X	f	Picture
External	ER 22-4API382		EL 22-4API382		4	1/2	0.87	0.122	0.08	0.11	
	22-4API383		22-4API383		4	1/2	0.87	0.122	0.08	0.11	
	22-4API502		22-4API502		4	1/2	0.87	0.148	0.08	0.11	
	22-4API503		22-4API503		4	1/2	0.87	0.148	0.08	0.11	
	22-5API403		22-5API403		5	1/2	0.87	0.118	0.07	0.10	
	22-6API551		22-6API551		6	1/2	0.87	0.056	0.10	0.09	
	27-4API382		27-4API382		4	5/8	0.63	0.122	0.08	0.11	
	27-4API383		27-4API383		4	5/8	0.63	0.122	0.08	0.11	
	27-4API502		27-4API502		4	5/8	0.63	0.148	0.08	0.12	
	27-4API503		27-4API503		4	5/8	0.63	0.148	0.08	0.12	
	27-5API403		27-5API403		5	5/8	0.63	0.056	0.07	0.11	
Internal	IR 22-4API382		IL 22-4API382		4	1/2	0.87	0.122	0.08	0.11	
	22-4API383		22-4API383		4	1/2	0.87	0.122	0.08	0.11	
	22-4API502		22-4API502		4	1/2	0.87	0.148	0.08	0.12	
	22-4API503		22-4API503		4	1/2	0.87	0.148	0.08	0.11	
	22-5API403	●	22-5API403		5	1/2	0.87	0.118	0.07	0.10	
	22-6API551		22-6API551		6	1/2	0.87	0.056	0.10	0.09	
	27-4API382		27-4API382		4	5/8	0.63	0.122	0.08	0.11	
	27-4API383		27-4API383		4	5/8	0.63	0.122	0.08	0.11	
	27-4API502		27-4API502		4	5/8	0.63	0.148	0.08	0.12	
	27-4API503		27-4API503		4	5/8	0.63	0.148	0.08	0.12	
	27-5API403		27-5API403		5	5/8	0.63	0.056	0.07	0.11	

Applicable holders D31, D32

● : Stock item

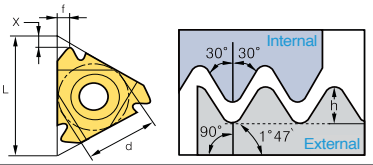
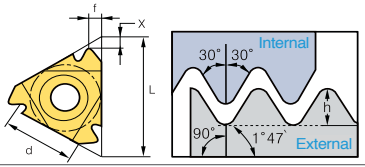
API Buttress Casing (BUT)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions						Picture
						lPF	d	L	hmin	X	f	
External	ER 22-5BUT75		EL 22-5BUT75		5	0.75	1/2	0.87	0.061	0.12	0.12	
	22-5BUT1		22-5BUT1		5	1	1/2	0.87	0.061	0.12	0.12	
Internal	IR 22-5BUT75		IL 22-5BUT75		5	0.75	1/2	0.87	0.061	0.12	0.12	
	22-5BUT1		22-5BUT1		5	1	1/2	0.87	0.061	0.12	0.12	

Applicable holders **D31, D32**

● : Stock item

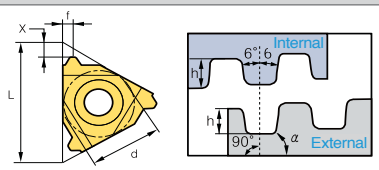
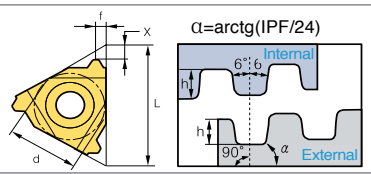
API Round Casing & Tubing (APIRD)

Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions					Picture
						d	L	hmin	X	f	
External	ER 16-10APIRD	●	EL 16-10APIRD		10	3/8	0.63	0.056	0.05	0.06	
	16-8APIRD	●	16-8APIRD		8	3/8	0.63	0.071	0.05	0.06	
Internal	IR 16-10APIRD	●	IL 16-10APIRD		10	3/8	0.63	0.056	0.05	0.06	
	16-8APIRD	●	16-8APIRD		8	3/8	0.63	0.071	0.05	0.06	

Applicable holders **D31, D32**

● : Stock item

Extreme Line Casing (EL)

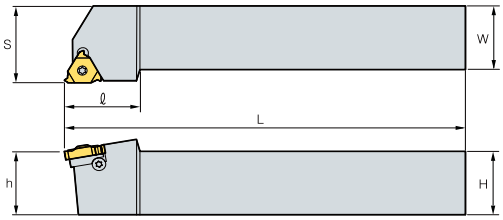
Type	Designation (Right)	PC3030T	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions						Picture
						lPF	d	L	hmin	X	f	
External	ER 22-6EL15		EL 22-6EL15		6	1.5	1/2	0.087	0.048	0.07	0.07	
	22-5EL125		22-5EL125		5	1.25	1/2	0.087	0.067	0.09	0.09	
Internal	IR 22-6EL15		IL 22-6EL15		6	1.5	1/2	0.087	0.055	0.07	0.07	
	22-5EL125		22-5EL125		5	1.25	1/2	0.087	0.075	0.09	0.09	

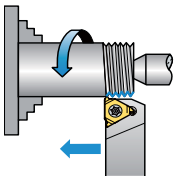
Applicable holders **D31, D32**

● : Stock item

ER(L)H

(Screw on system)





Righthand drawing

(inch)

Designation		Stock R	Stock L	Inscribed circle	H	W	L	S	h	ℓ	Insert Screw	Shim Screw	Screw RH	Screw LH	Wrench
ER(L)H	031N-11			1/4	0.31	0.31	5.37	0.425	0.31	0.69					
	039N-11			1/4	0.39	0.39	2.75	0.43	0.39	0.68	ST11N	-	-	-	TW08P
	050N-11	●		1/4	0.50	0.50	3.14	0.47	0.50	0.68					
	050N-16			3/8	0.50	0.50	3.27	0.625	0.50	0.87	ST16N	-	-	-	TW10P
	3/8-16			3/8	0.375	0.375	2.45	0.625	0.375	0.76					
	050-16			3/8	0.50	0.50	3.27	0.625	0.50	0.87					
	0625-16			3/8	0.625	0.625	5.00	0.625	0.625	1.02	ST16	STA16	ATE16	ATI22	TW10P
	075-16	●		3/8	0.75	0.75	5.00	0.75	0.75	1.02					
	100-16	●		3/8	1.00	1.00	6.00	1.00	1.00	1.20					
	125-16			3/8	1.25	1.25	7.00	1.25	1.25	1.18					
	100-22			1/2	1.00	1.00	6.00	1.00	1.00	1.42					
	125-22			1/2	1.25	1.25	7.00	1.25	1.25	1.42	ST22	STA22	ATE22	ATI22	TW20P
	150-22			1/2	1.50	1.50	8.00	1.50	1.50	1.42					
	100-27			5/8	1.00	1.00	6.00	1.25	1.00	1.57					
	125-27			5/8	1.25	1.25	7.00	1.25	1.25	1.57	ST27	STA27	ATE27	ATI27	TW25L
	150-27			5/8	1.50	1.50	8.00	1.50	1.50	1.57					
	200-27			5/8	2.00	2.00	10.00	2.00	2.00	1.57					

Applicable holders **D10~D13, D16, D18, D19, D22, D23~D26**

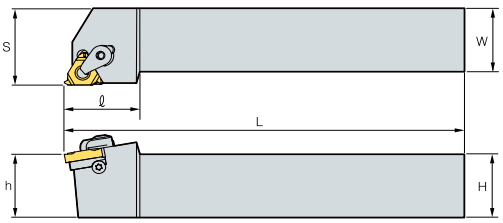
• Helix angle is 1.5° for all holders.

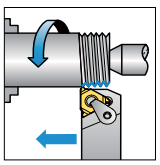
• No shim needed for N type holder

● : Stock item

ER(L)H-C

(Clamp on system)





Righthand drawing

(inch)

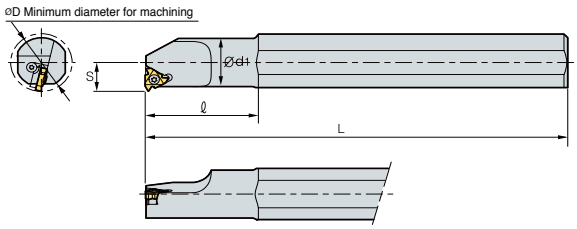
Designation		Stock R	Stock L	Inscribed circle	H	W	L	S	h	ℓ	Insert Screw	Shim Screw	Screw RH	Screw LH	Wrench
ER(L)H-C	075-16C			3/8	0.75	0.75	5.00	0.75	0.75	1.02					TW10P
	100-16C			3/8	1.00	1.00	6.00	1.00	1.00	1.20	STA16	CTH16	ATE16	ATI16	TW15P
	125-16C			3/8	1.25	1.25	7.00	1.25	1.25	1.18					
	100-22C			1/2	1.00	1.00	6.00	1.00	1.00	1.42					
	125-22C			1/2	1.25	1.25	7.00	1.25	1.25	1.42	STA22	CTH22	ATE22	ATI22	TW20P
	150-22C			1/2	1.50	1.50	8.00	1.50	1.50	1.42					
	100-27C			5/8	1.00	1.00	6.00	1.00	1.00	1.57					
	125-27C			5/8	1.25	1.25	7.00	1.25	1.25	1.57	STA27	CTH27	ATE27	ATI27	TW25L
	150-27C			5/8	1.50	1.50	8.00	1.50	1.50	1.57					
	200-27C			5/8	2.00	2.00	10.00	2.00	2.00	1.57					

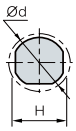
Applicable holders **D10~D13, D16, D18, D19, D22, D23~D26**

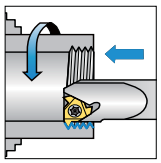
• Helix angle is 1.5° for all holders.

● : Stock item

IR(L)H
(Screw on system)







Righthand drawing

(inch)

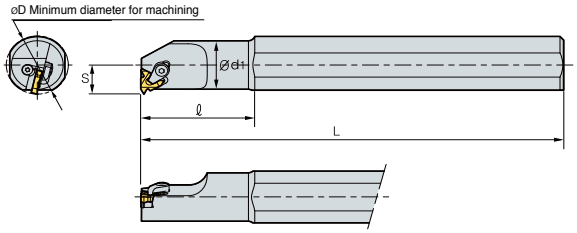
Designation		Stock R	Stock L	Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Insert Screw	Shim Screw	Screw RH	Screw LH	Wrench
IR(L)H	0375DN-11			1/4	0.50	0.40	0.375	0.37	3.9	0.28	-	ST11N	-	-	-	TW08P
	0375N-11	●	●	1/4	0.50	0.75	0.375	0.67	7.0	0.28	1.00					
	050N-11	●		1/4	0.65	0.75	0.50	0.67	7.0	0.37	1.25					
	050N-16	●		3/8	0.67	0.75	0.50	0.67	7.0	0.40	1.25					
	0625N-16			3/8	0.80	0.75	0.625	0.67	7.0	0.46	1.50	ST16N	-	-	-	TW10P
	0625DN-16			3/8	0.80	0.625	0.625	0.58	6.0	0.46	1.25					
	075-16			3/8	0.90	0.75	0.75	0.67	7.0	0.51	1.50					
	100-16			3/8	0.12	1.25	1.00	1.12	10.0	0.65	2.50					
	100D-16			3/8	1.20	1.00	1.00	0.90	8.0	0.65	1.75	ST16	STA16	ATI16	ATE16	TW10P
	125-16			3/8	1.45	1.25	1.25	1.12	10.0	0.77	2.50					
	150-16			3/8	1.65	1.50	1.50	1.34	12.0	0.90	2.50					
	075N-22			1/2	1.00	0.75	0.75	0.67	7.0	0.59	2.00	ST22N	-	-	-	TW20P
	100-22			1/2	1.25	1.25	1.00	1.12	10.0	0.71	2.50					
	100D-22			1/2	1.25	1.00	1.00	0.88	8.0	0.71	1.75	ST22	STA22	ATI22	ATE22	TW20P
	125-22			1/2	1.50	1.25	1.25	1.12	10.0	0.85	2.50					
	150-22			1/2	1.75	1.50	1.50	1.34	12.0	0.98	2.50					
	125-27			5/8	1.55	1.25	1.25	1.12	10.0	0.88	2.50					
	150-27			5/8	1.80	1.50	1.50	1.34	12.0	1.00	2.50	ST27	STA27	ATI27	ATE27	TW25L
	200-27			5/8	2.30	2.00	2.00	1.80	14.0	1.25	3.00					
	250-27			5/8	2.80	2.50	2.50	2.26	16.0	1.50	3.00					

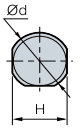
Applicable holders **D10, D11, D14, D15, D17, D 20~D25, D27~D30**

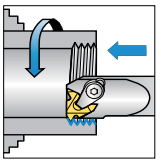
• Helix angle is 1.5° for all holders. • No shim needed for N type holder

● : Stock item

IR(L)H-C
(Clamp on system)







Righthand drawing

(inch)

Designation		Stock R	Stock L	Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Insert Screw	Shim Screw	Screw RH	Screw LH	Wrench
IR(L)H	075-16C			3/8	0.90	0.75	0.75	0.67	7.0	0.51	1.50					
	100-16C			3/8	1.20	1.25	1.00	1.12	10.0	0.65	2.50					TW10P
	100D-16C			3/8	1.20	1.00	1.00	0.9	8.0	0.65	1.75	STA16	CTH16	ATI16	ATE16	TW15P
	125-16C			3/8	1.45	1.25	1.25	1.12	10.0	0.77	2.50					
	150-16C			3/8	1.65	1.50	1.50	1.34	12.0	0.90	2.50					
	100-22C			1/2	1.25	1.25	1.00	1.12	10.0	0.71	2.50					
	100D-22C			1/2	1.25	1.00	1.00	0.88	8.0	0.71	1.75	STA22	CTH22	ATI22	ATE22	TW20P
	125-22C			1/2	1.50	1.25	1.25	1.12	10.0	0.85	2.50					
	150-22C			1/2	1.75	1.50	1.50	1.34	12.0	0.98	2.50					
	125-27C			5/8	1.55	1.25	1.25	1.12	10.0	0.88	2.50					
	150-27C			5/8	1.80	1.50	1.50	1.34	12.0	1.00	2.50					
	200-27C			5/8	2.30	2.00	2.00	1.8	14.0	1.25	3.00	STA27	CTH27	ATI27	ATE27	TW25L
	250-27C			5/8	2.80	2.50	2.50	2.26	16.0	1.50	3.00					

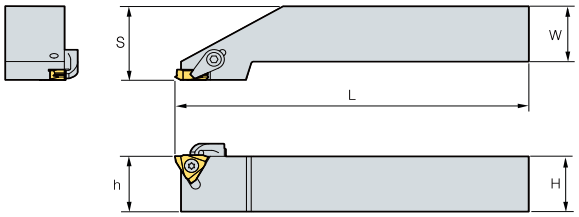
Applicable holders **D10, D11, D14, D15, D17, D 20~D25, D27~D30**

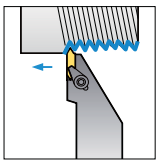
• Helix angle is 1.5° for all holders.

● : Stock item

VTH

VETR





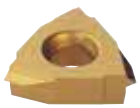
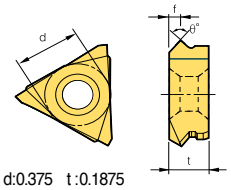
Righthand drawing

(inch)

Designation		Stock	H=(h)	W	L	S	Inserts	Clamp	Clamp Screw	Screw	Wrench
VTH	12R		0.787	0.787	4.921	1.039	VETR	CS6R1	DHA0617	FTKA03510	TW15P, HW30L
	16R		0.984	0.984	5.906	1.315					
	85R		1.260	0.984	6.693	1.315					

● : Stock item

Vertical Type Thread Insert

Picture	Designation		Coated	Cermet	Uncoated	Dimensions			Picture
			PC130	CN20	ST10	Pitch (mm)	θ	f	
	VETR	080				0.8	60°	0.055	 d:0.375 t:0.1875
		100			●	1.0	60°	0.055	
		125				1.25	60°	0.055	
		150			●	1.5	60°	0.047	
		175				1.75	60°	0.047	
		200			●	2.0	60°	0.047	
		250			●	2.5	60°	0.055	
		300			●	3.0	60°	0.063	
		150F		●	●	0.8~1.5	60°	0.055	
		300F	●	●	●	1.5~3.0	60°	0.063	

● : Stock item

Thread Milling Holders code system

TM S R L 050 - 11

1 Insert Style | 2 Holder Style | 3 Hand | 4 Shank Type | 5 Shank Dia. | 6 Cutting edge Length

1 Insert Style
TM S R L 050 - 11

Thread Milling Holder

3 Hand
TM S R L 050 - 11

R : Right Hand L : Left Hand

5 Shank Dia.
TM S R L 050 - 11

050 : 0.50	100 : 1.00
0625 : 0.625	125 : 1.25
075 : 0.75	150 : 1.50

2 Holders Style
TM S R L 050 - 11

S : Shank Type

4 Shank Type
TM S R L 050 - 11

None : Standard
L : Long Type
T : Taper Type

6 Cutting edge Length
TM S R L 050 - 11

10 : 0.41	22 : 0.87
11 : 0.43	27 : 1.06
16 : 0.63	38 : 1.52

Thread Milling Inserts code system

TM 2 I 16 - 1.5 ISO

1 Insert Style | 2 Cutting Edge | 3 Type of Insert | 4 Cutting edge Length | 5 Pitch | 6 Standard

1 Insert Style
TM 2 I 16 - 1.5 ISO

Thread Milling Holder

2 Cutting Edge
TM 2 I 16 - 1.5 ISO

None : 1 cutting edge
2 : 2 cutting edge

3 Type of Insert
TM 2 I 16 - 1.5 ISO

I : Internal
E : External
EI : External & Internal

4 Cutting edge Length
TM 2 I 16 - 1.5 ISO

10 : 0.41
11 : 0.43
16 : 0.63
22 : 0.87
27 : 1.06
38 : 1.52

5 Pitch
TM 2 I 16 - 1.5 ISO

mm : 0.5 ~ 6.0 tpi : 48 ~ 6

6 Standard
TM 2 I 16 - 1.5 ISO

ISO Metric

American UN(UNC, UNF, UNEF)

UNJ

Whit Worth (BSW, BSF, BSP, BSB)

National Pipe Thread (NPT)

National Pipe Thread (NPTF)

British Standard Pipe Thread (BSPT)

Thread Milling

The right Tool for the Job

Small diameter type

Tool holder : TMSR **Insert** : TM L=0.41inch
For small bore diameters down to 0.371inch

Standard Type

Tool holder : TMSR **Insert** : TM2
For standard length threads

Long Type

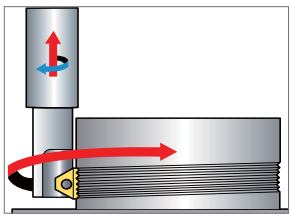
Tool holder : TMSR **Insert** : TM2
For long or remote threads

Tapered Type

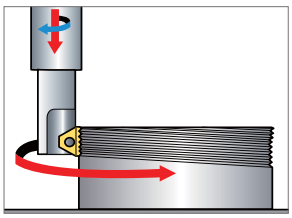
Tool holder : TMSR **Insert** : TM2(BSPT, NPT, NPTF)
For standard length threads

Thread milling methods

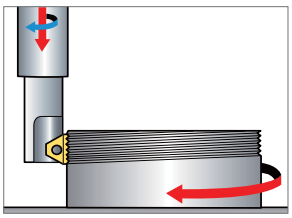
External threading



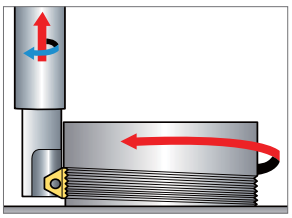
Right handed Thread
Conventional Milling



Left handed Thread
Down Milling

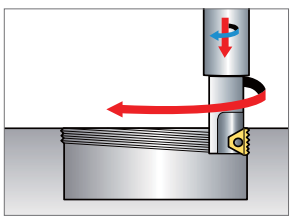


Right handed Thread
Down Milling

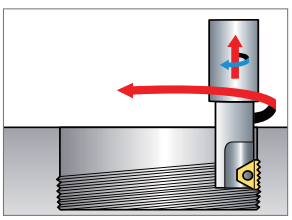


Left handed Thread
Conventional Milling

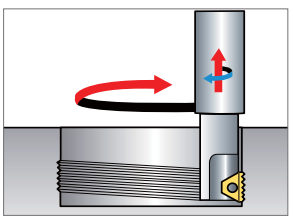
Internal threading



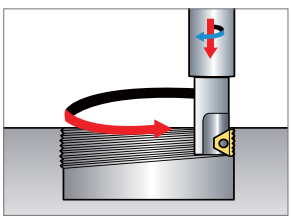
Right handed Thread
Down Milling



Left handed Thread
Conventional Milling

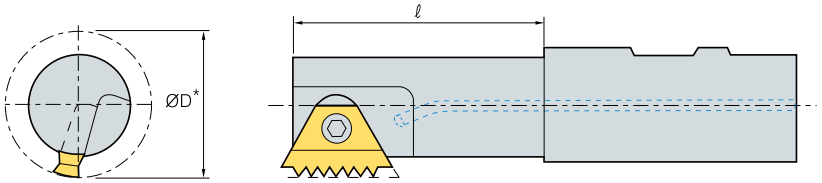


Right handed Thread
Conventional Milling



Left handed Thread
Down Milling

Tooling recommendation* for given INTERNAL thread specification

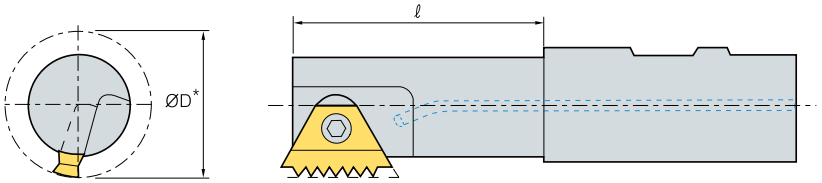


ISO

Pitch (mm)	Nominal Dia. (mm)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
0.75	11	TMSR 12-10	TM2I 10-0.75ISO	0.47	0.35	0.017
1.0	12-14	TMSR 12-10	TM2I 10-1.0ISO	0.47	0.35	0.023
	15-18	TMSR 12-11	TM2I 11-1.0ISO	0.47	0.45	
	20	TMSR 16-16	TM2I 16-1.0ISO	0.87	0.67	
	22	TMSR 20-22	TM2I 22-1.0ISO	1.14	0.75	
	24	TMSR 20-16	TM2I 16-1.0ISO	1.69	0.79	
	25-28	TMSRL 25-16	TM2I 16-1.0ISO	0.98	0.87	
1.25	14	TMSR 12-10	TM2I 10-1.25ISO	0.47	0.35	0.028
1.5	14-15	TMSR 12-10	TM2I 10-1.5ISO	0.47	0.35	0.034
	16-20	TMSR 12-11	TM2I 11-1.5ISO	0.47	0.45	
	22	TMSR 16-16	TM2I 16-1.5ISO	0.87	0.67	
	24	TMSR 20-22	TM2I 22-1.5ISO	1.14	0.75	
	25-26	TMSR 20-16	TM2I 16-1.5ISO	1.69	0.79	
	27-30	TMSRL 25-16	TM2I 16-1.5ISO	0.98	0.87	
	35-42	TMSR 25-27	TM2I 27-1.5ISO	2.05	1.18	
	45	TMSR 32-27	TM2I 27-1.5ISO	2.28	1.46	
2.0	22	TMSRT 16-16	TM2I16-2.0ISO	0.87	0.61	0.045
	24	TMSR 16-16	TM2I 16-2.0ISO	0.87	0.67	
	25	TMSR 20-22	TM2I 22-2.0ISO	1.14	0.75	
	27	TMSR 20-16	TM2I 16-2.0ISO	1.69	0.79	
	28-32	TMSRL 25-16	TM2I 16-2.0ISO	0.98	0.87	
	39-42	TMSR 25-27	TM2I 27-2.0ISO	2.05	1.18	
	45-48	TMSR 32-27	TM2I 27-2.0ISO	2.28	1.46	
3.0	42-48	TMSR 25-27	TM2I 27-3.0ISO	2.05	1.18	0.068
	50-52	TMSR 32-27	TM2I 27-3.0ISO	2.28	1.46	
4.0	45-52	TMSR 25-27	TM2I 27-4.0ISO	2.05	1.18	0.091
	55	TMSR 32-38	TM2I 38-4.0ISO	2.17	1.38	
	56-58	TMSR 32-27	TM2I 27-4.0ISO	2.28	1.46	
	60-65	TMSR 40-38	TM2I 38-4.0ISO	2.56	1.81	
5.0	48-52	TMSR 32-38	TM2I 38-5.0ISO	2.05	1.18	0.114
5.5	56	TMSR 32-38	TM2I 38-5.5ISO	2.17	1.38	0.125
	60	TMSR 40-38	TM2I 38-5.5ISO	2.56	1.81	
6.0	64-68	TMSR 40-38	TM2I 38-6.0ISO	2.56	1.81	0.136

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation* for given INTERNAL thread specification

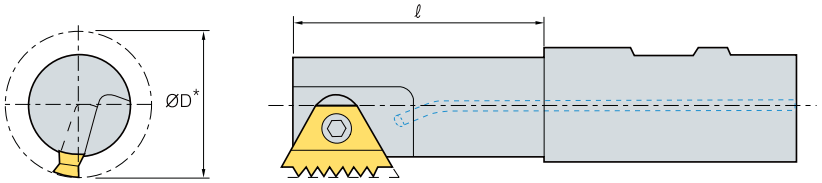


UN

Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
32	7/16-1/2	TMSR050-10	TMI 10-32UN	0.47	0.35	0.018
	9/16-11/16	TMSR050-11	TM2I 11-32UN	0.47	0.45	
	3/4-13/16	TMSR0625-16	TM2I 16-32UN	0.87	0.67	
	7/8-15/16	TMSR075-16	TM2I 16-32UN	1.69	0.79	
	1	TMSR100-16	TM2I 16-32UN	0.98	0.87	
28	7/16-1/2	TMSR050-10	TMI 10-28UN	0.47	0.35	0.020
	9/16-3/4	TMSR050-11	TM2I 11-28UN	0.47	0.45	
	13/16-7/8	TMSR0625-16	TM2I 16-28UN	0.87	0.67	
	15/16	TMSR075-16	TM2I 16-28UN	1.69	0.79	
	1-1 1/8	TMSRL100-16	TM2I 16-28UN	0.98	0.87	
24	9/16-11/16	TMSR050-11	TM2I 11-24UN	0.47	0.45	0.024
20	1/2-9/16	TMSR050-10	TMI 10-20UN	0.47	0.35	0.029
	5/8-13/16	TMSR050-11	TM2I 11-20UN	0.47	0.45	
	7/8	TMSR0625-16	TM2I 16-20UN	0.87	0.67	
	15/16-1	TMSR075-16	TM2I 16-20UN	0.69	0.79	
	1 1/16-1 1/8	TMSRL100-167	TM2I 16-20UN	0.98	0.87	
	1 3/8-1 5/8	TMSR100-27	TM2I 27-20UN	2.05	1.18	
	1 11/16-1 13/16	TMSR125-27	TM2I 27-20UN	2.28	1.46	
18	5/8	TMSR050-11	TM2I 11-18UN	0.47	0.45	0.032
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-18UN	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-18UN	2.05	1.18	
	1 11/16	TMSR125-27	TM2I 27-18UN	2.28	1.46	
16	11/16-13/16	TMSR050-11	TM2I 11-16UN	0.47	0.45	0.036
	7/8-15/16	TMSR0625-167	TM2I 16-16UN	0.87	0.67	
	1	TMSR075-16	TM2I 16-16UN	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-16UN	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-16UN	2.05	1.18	
	1 11/16-1 7/8	TMSR125-27	TM2I 27-16UN	2.28	1.46	
14	7/8	TMSR050-11	TM2I 11-14UN	0.47	0.45	0.041
12	7/8	TMSRT0625-16	TM2I 16-12UN	0.87	0.61	0.048
	15/16	TMSR0625-16	TM2I 16-12UN	0.87	0.67	
	1	TMSR075-225	TM2I 22-12UN	1.14	0.75	
	1 1/16	TMSR075-16	TM2I 16-12UN	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2I 16-12UN	0.98	0.87	
	1 1/2-1 11/16	TMSR100-27	TM2I 27-12UN	2.05	1.18	
	1 3/4-1 15/16	TMSR125-27	TM2I 27-12UN	2.28	1.46	
8	1 11/16-1 15/16	TMSR100-27	TM2I 27-8UN	2.05	1.18	0.072
	2-1 1/8	TMSR125-27	TM2I 27-8UN	2.28	1.46	
6	2-2 1/8	TMSR100-27	TM2I 27-6UN	2.05	1.18	0.096
	2 1/4	TMSR125-27	TM2I 27-6UN	2.28	1.46	
	2 3/8-2 1/2	TMSR150-38	TM2I 38-6UN	2.56	1.18	
4.5	2-2 1/4	TMSR125-38	TM2I 38-4.5UN	2.17	1.38	0.128
4	2 1/2	TMSR150-38	TM2I 38-4UN	2.56	1.81	0.144

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation* for given INTERNAL thread specification



UNJ

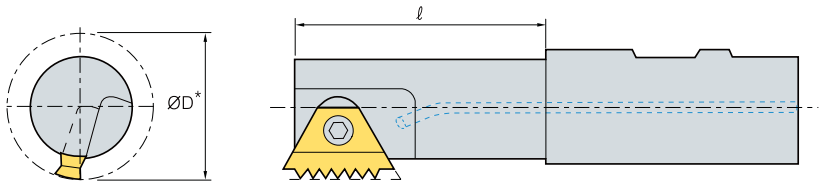
Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
24	9/16-11/16	TMSR050-11	TM2I 11-24UNJ	0.47	0.45	0.024
20	1/2	TMSR050-10	TMI 10-20UNJ	0.47	0.35	0.029
	3/4-13/16	TMSR050-11	TM2I 11-20UNJ	0.47	0.45	
	7/8	TMSR0625-16	TM2I 16-20UNJ	0.87	0.67	
	15/16-1	TMSR075-16	TM2I 16-20UNJ	1.69	0.79	
18	5/8	TMSR050-11	TM2I 11-18UNJ	0.47	0.45	0.032
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-18UNJ	0.98	0.87	
16	11/16-13/16	TMSR050-11	TM2I 11-16UNJ	0.47	0.45	0.036
	7/8-15/16	TMSR0625-16	TM2I 16-16UNJ	0.87	0.67	
	1	TMSR075-16	TM2I 16-16UNJ	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-16UNJ	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-16UNJ	2.05	1.18	
	1 11/16-1 7/8	TMSR125-27	TM2I 27-16UNJ	2.28	1.46	
14	7/8	TMSR050-11	TM2I 11-14UNJ	0.47	0.45	0.041
12	7/8	TMSRT0625-16	TM2I 16-12UNJ	0.87	0.61	0.048
	15/16-1	TMSR0625-16	TM2I 16-12UNJ	0.87	0.67	
	1 1/16	TMSR075-16	TM2I 16-12UNJ	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2I 16-12UNJ	0.98	0.87	
	1 1/2-1 11/16	TMSR100-27	TM2I 27-12UNJ	2.05	1.18	
	1 3/4-1 15/16	TMSR125-27	TM2I 27-12UNJ	2.28	1.46	

W

Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
26	1/2-9/16	TMSR050-10	TMEI 10-26W	0.47	0.35	0.025
	5/8-3/4	TMSR050-11	TM2EI 11-26 W	0.47	0.45	
	13/16-7/8	TMSR0625-16	TM2EI 16-26W	0.87	0.67	
	15/16-1	TMSR075-16	TM2EI 16-26W	1.69	0.79	
	1 1/16-1 1/8	TMSRL100-16	TM2EI 16-26W	0.98	0.87	
20	9/16	TMSR050-10	TM2EI 10-20W	0.47	0.35	0.032
	5/8-13/16	TMSR050-11	TM2EI 11-20W	0.47	0.45	
	7/8-15/16	TMSR0625-16	TM2EI 16-20W	0.87	0.67	
	1	TMSR075-16	TM2EI 16-20W	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2EI 16-20W	0.98	0.87	
16	13/16	TMSR0625-16	TM2EI 16-16W	0.87	0.61	0.040
	7/8-15/16	TMSR0625-16	TM2EI 16-16W	0.87	00.67	
	1-1 1/16	TMSR075-16	TM2EI 16-16W	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2EI 16-16W	0.98	0.87	
	1.4-1 5/8	TMSR100-27	TM2EI 27-16W	2.05	1.18	
	1 3/4-1.9	TMSR125-27	TM2EI 27-16W	2.28	1.46	
12	1 1/2-1 3/4	TMSR100-27	TM2EI 27-12W	2.05	1.18	0.054
	1 7/8	TMSR125-27	TM2EI 27-12W	2.28	1.46	
8	1 7/8-1.9	TMSR100-27	TM2EI 27-8W	2.05	1.18	0.080
	2.1-2 1/8	TMSR125-276	TM2EI 27-8W	2.28	1.46	
7	2	TMSR100-27	TM2EI 27-7W	2.05	1.18	0.091
6	2.1-2 1/8	TMSR100-27	TM2EI 27-6W	2.05	1.18	0.107
	2 1/4	TMSR125-38	TM2EI 38-6W	2.17	1.38	
	2 3/8-2.6	TMSR125-27	TM2EI 27-6W	2.28	1.46	
	2 5/8-2 3/4	TMSR150-38	TM2EI 38-6W	2.56	1.81	
5	3	TMSR150-38	TM2EI 38-5W	2.56	1.81	0.128
4.5	3 1/2	TMSR150-38	TM2EI 38-4.5W	2.56	1.81	0.142

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation* for given INTERNAL thread specification



BSPT

Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
19	3/8	TMSR 21-11	TM2EI 11-19 BSPT	0.79	0.45	0.034
14	1/2-3/4	TMSRT 16-11	TM2EI 16-14 BSPT	0.87	0.61	0.046
11	1-1 1/4	TMSRT 20-16	TM2EI 16-11 BSPT	0.91	0.75	0.058
	1 1/2	TMSR 25-27	TM2EI 27-11 BSPT	2.05	1.18	
	2-6	TMSRT 32-27	TM2EI 27-11 BSPT	2.28	1.46	

NPT

Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPT	0.87	0.61	0.052
	3/4	TMSRT 20-16	TM2EI 16-14 NPT	0.91	0.75	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPT	0.91	0.75	0.056
	1 1/4	TMSR 25-27	TM2EI 27-11.5 NPT	2.05	1.18	
	1 1/2-2	TMSRT 32-27	TM2EI 27-11.5 NPT	2.28	1.46	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPT	2.28	1.46	0.095
	3-24	TMSR 40-38	TM2EI 38-8 NPT	2.28	1.81	

NPTF

Pitch (tpi)	Nominal Dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread Depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPTF	0.87	0.61	0.053
	3/4	TMSRT 20-16	TM2EI 16-14 NPTF	0.91	0.75	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPTF	0.91	0.75	0.064
	1 1/2	TMSR 25-27	TM2EI 27-11.5 NPTF	2.05	1.18	
	2	TMSRT 32-27	TM2EI 27-11.5 NPTF	2.28	1.46	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPTF	2.28	1.46	0.095
	3	TMSR 40-38	TM2EI 38-8 NPTF	2.28	1.81	

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Minimum Bore Diameters for Thread milling

Pitch		0.5	0.6	0.7	0.75 0.80	0.9	1.0	1.25	1.5	1.75	2.0	-	2.5	3.0	3.5	4.0	4.5	5.0	5.5	-	6.0	-
	tpi	48	44	36	32	28	26 24	20 19	18 16	14	13 12	11.5 11	10	9 8	7	6	-	5	-	4.5	-	4
Holder Designation	diameter	Minimum diameter for machining																				
TMSR 12-10	0.35	0.37	0.38	0.39	0.39	0.41	0.42	0.45	0.47													
TMSR 20-10	0.35	0.37	0.38	0.39	0.39	0.41	0.42	0.45	0.47													
TMSR 12-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.59												
TMSR 20-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.5												
TMSRL 25-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.59												
TMSRT 16-16	0.61	0.63	0.64	0.65	0.65	0.67	0.68	0.70	0.73	0.75	0.77	0.79										
TMSR 16-16	0.67	0.69	0.70	0.71	0.72	0.74	0.75	0.77	0.79	0.81	0.83	0.85										
TMSR 16-22	0.67	0.69	0.70	0.71	0.72	0.74	0.75	0.77	0.79	0.81	0.83	0.85										
TMSR 20-22	0.75	0.78	0.79	0.80	0.80	0.82	0.83	0.85	0.87	0.89	0.91	0.93										
TMSRT 20-16	0.75	0.78	0.79	0.80	0.80	0.82	0.83	0.85	0.87	0.89	0.91	0.93										
TMSR 20-16	0.79	0.81	0.83	0.83	0.84	0.86	0.87	0.89	0.91	0.93	0.94	0.96										
TMSRW 25-22	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSRL 25-22	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSRL 25-16	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSR 25-27	1.18	1.21	1.22	1.23	1.24	1.25	1.26	1.29	1.32	1.34	1.36	1.40	1.44	1.54	1.65	1.77	1.89					
TMSRL 25-27	1.18	1.21	1.22	1.23	1.24	1.25	1.26	1.29	1.32	1.34	1.36	1.40	1.44	1.54	1.65	1.77	1.89					
TMSR 32-38	1.38															1.97	2.10	1.67	1.97	1.76	2.26	2.23
TMSR 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSRL 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSRT 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSR 40-38	1.81															2.19	2.17	2.07	2.13	2.15	2.26	2.23
TMSRL 40-38	1.81															2.19	2.17	2.07	2.13	2.15	2.26	2.23

In order to perform a thread milling operation, a milling machine with three-axis control capability of helical interpolation is required. Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simulataneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B(Fig,A) on the envelope of the cylinder combines a circular movemint in the xy plane with a linear dispalcement in the z direction
On most CNC systems this function can be execyted in two different ways:

GO2 : Heilcal interpolation in
a colckwise direction
GO3 : Helical interpolation in
a counter-clockwise direction

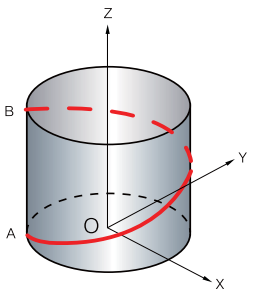


Fig. A

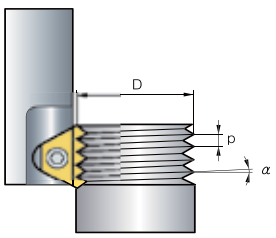


Fig. B

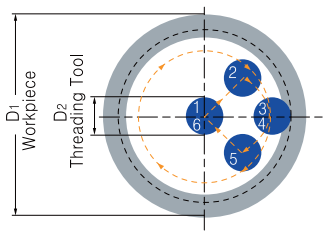
▶ The thread milling operation (Fig. B) consists of circular rotation of fhe tool around its own axis togerther with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form. There are three acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

1. Tangential Arc Approach
2. Radial Approach
3. Tangential Line Approach

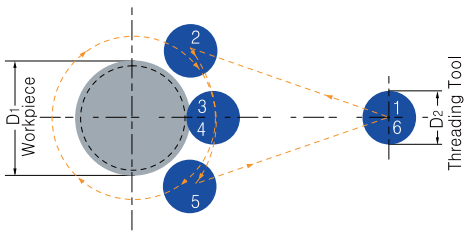
Tangential Arc Approach

▶ With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials. Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads

Internal Thread



External Thread



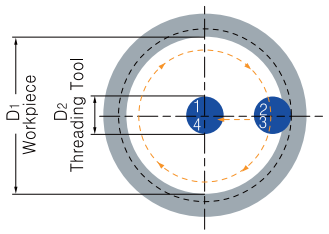
1-2 : rapid approach
2-3 : tool entry along tangential arc, with simultaneous feed along z-axis
3-4 : helical movement during one full orbit (360°)
4-5 : tool exit along tangential arc, with continuing feed along z-axis
5-6 : rapid return

Radial Approach

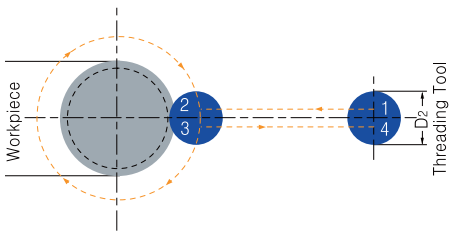
▶ This is the simplest method. There are two characteristics worth nothing about the radial approach:
A. a small vertical mark may be lift at the entry (and exit) point. This is of no significance to the thread itself
B. when using this method with very hard materials, there may be a tendency of the tool to vibrate as it approaches the full cutting depth

▶ Note: Radial feed during entry to the full profile depth should only be 1/3 of the subsequent circular feed!

Internal Thread



External Thread

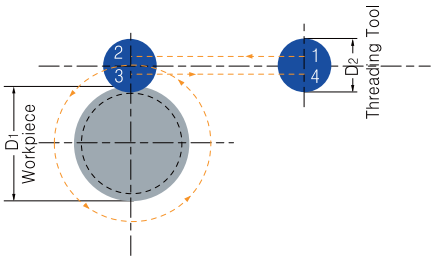


1-2 : radial entry
2-3 : helical movement during one full orbit (360°)
3-4 : radial exit

Tangential Line Approach

▶ This method is very simple, and has all of the advantages of the tangential arc method. However, it is applicable only with external threads

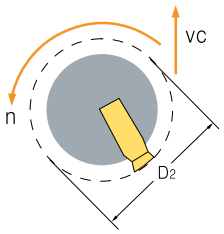
External Thread



1-2 : radial entry with simultaneous feed along z axis
2-3 : helical movement during one full orbit (360°)
3-4 : radial exit

Preparing for the Thread Milling Operation

Calculation of Rotational Velocity and Feed at the Cutting Edge



$$n = \frac{vc \times 12}{\pi \times D2}$$

$$vc = \frac{n \times \pi \times D2}{12}$$

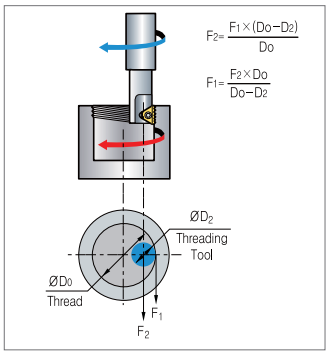
$$F1 = n \times z \times fn$$

n - Rotational Velocity [R.P.M]
vc - Cutting Speed [sfm]
D2 - Tool holder Cutting Dia. [inch]
F1 - Real Feed rate at the Cutting edges [ipm]
z - No. of Cutting Edges
fn - Feed per Rooth per Rotation [ipr]

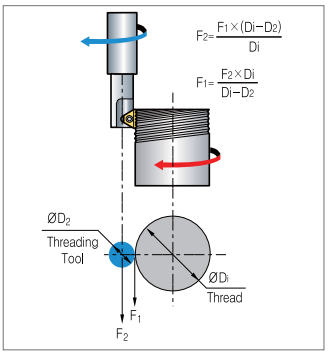
Calculation of Feed Rates at the Tool Center Line

▶ On most CNC machines, the feed rate required for programming is that of the center-line of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and the center line are identical, but with circular tool movement this is not the case The equations define the relationship between feed rates at the cutting edge and at the tool center line

Internal Thread



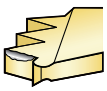
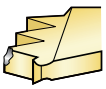
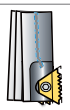
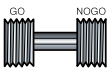
External Thread



Grades and Applications

Grade	Application
PC9570T	**First Choice for steel and cast iron** A tough sub-micron substrate with TiCN coating Provides good fracture toughness and excellent wear resistance
PC9070T	**General grade** Enhance wear Resisfomce with new-coating technology Multi layer film Superior performance for stainless steel and HSS

Trouble shooting

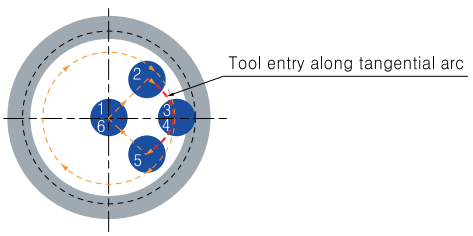
Problem		Possible	Solution
	**Increased insert flank wear**	Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
	**Chipping of cutting edge**	Chip is too thick Vibration	Redyce feed rate / Use the tangential arc method Increase RPM Check stability
	**Material Built-up on the cutting edge**	Incorrect cutting speed Unsuitable carbide grade	Change cutting speed Use a coated carbide grade
	**Chatter / Vibartion**	Feed rate is too high Profile is too deep Thread length is too long	Reduce the feed. Execute two passes, each with increased cutting depth/ Execute two passes, each cutting only half the thread length Execute two passes, each cutting only half the thread length
	**Insyfficient thread accuracy**	Tool deflection	Reduce feed rate / Execute a “zero” cut

Recommended cutting condition

Workpiece			Hardness Brinell HB	vc(sfm) Grade		Feed fz(ipt)	
				PC9570T	PC9070M	Indexable Insert	Solid Endmill
P	Unalloyed steel	Low carbon(C+0.1-0.25%)	125	330-690	260~820	0.002-0.012	0.001~0.006
		Medium carbon(C=0.25-0.55%)	150	330-590	260~755	0.002-0.010	0.001~0.004
		High carbon (C=0.55-0.85%)	170	330-560	260~655	0.002-0.008	0.001~0.003
	Low alloy steel (alloying elements≤5%)	Non hardened	180	290-520	195~590	0.002-0.010	0.001~0.004
		Hardened	275	260-490	195~560	0.002-0.008	0.001~0.003
		Hardened	350	230-460	195~525	0.002-0.006	0.0004~0.001
	High alloy steel	Annealed	200	200-430	130~330	0.002-0.008	0.001~0.002
		Hardened	325	230-360	100~260	0.002-0.004	0.000~0.001
	Cast steel	Low alloy (alloying elements<5%)	200	330-560	260~820	0.002-0.006	0.001~0.004
		High alloy(alloying elements>5%)	225	230-390	195~560	0.002-0.004	0.0004~0.001
M	Stainless steel Feritic	Non hardened	200	330-560	195~490	0.002-0.006	0.002~0.004
		Hardened	330	330-560	195~395	0.002-0.004	0.0004~0.002
	Stainless steel Austenitic	Austentic	180	230-460	195~460	0.002-0.006	0.002~0.004
		Super austenitic	200	230-460	195~425	0.002-0.004	0.002~0.004
	Stainless steel Cast feritic	Non hardened	200	230-460	195~525	0.002-0.006	0.002~0.004
		Hardened	330	230-460	195~360	0.002-0.004	0.001~0.002
	Stainless steel Cast austenitic	Austenitic	200	230-390	195~490	0.002-0.006	0.002~0.004
		Hardened	330	230-390	195~330	0.002-0.004	0.001~0.002
	High eimperature alloys	Annealed (Iron based)	200	70-150	100~195	0.002-0.004	0.002~0.004
		Aged (Iron based)	280	70-100	65~165	0.001-0.002	0.0004~0.001
		Annealed(Nickel or Cobalt based)	250	50-70	50~115	0.001-0.002	0.0004~0.001
		Aged (Nickel or Cobalt based)	350	30-50	50~100	0.001--0.002	0.0004~0.001
	Titanium alloys	Pure 99.5 Ti	400Rm	230-460	130~260	0.001-0.002	0.001~0.002
		α +β alloys	1050Rm	70-160	65~165	0.001-0.002	0.001~0.002
K	Extra hard steel	Hardened & tempered	55HRC	70-150	50~160	0.0004-0.001	0.0002~0.0004
	Malleable cast iron	Ferritic (short chips)	130	200-430	230~525	0.0008-0.003	0.0004~0.001
		Pearlitic (long chips)	230	200-390	195~490	0.0008-0.002	0.001~0.002
	Grey cast iron	Low tensile strength	180	200-430	230~525	0.002-0.006	0.002~0.004
		High tensile strength	260	200-330	130~395	0.002-0.004	0.001~0.002
	Nodular SG iron	Feritic	160	200-410	130~360	0.002-0.006	0.002~0.004
		Pearlitic	260	160-290	130~330	0.002-0.004	0.001~0.002
	Aluminum alloys Wrought	Non aging	60	330-820	655~985	0.004-0.016	0.004~0.010
		Aged	100	330-590	490~820	0.004-0.012	0.004~0.008
	Aluminum alloys	Cast	75	490-1310	330~655	0.004-0.012	0.004~0.008
		Cast & aged	90	490-920	395~720	0.002-0.010	0.004~0.006
		Cast Si 13-22%	130	260-490	655~985	0.004-0.012	0.004~0.008
	Copper and copper alloys	Brass	90	390-670	655~985	0.004-0.012	0.004~0.010
		Bronze and mom leaded copper	100	390-670	490~820	0.002-0.010	0.004~0.008

Recommendation

▶ At tool entry, set the Feed fz [ipt] to 70% lower than the threading Feed

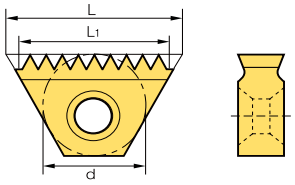


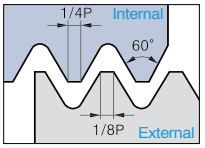
Example

▶ Threading Feed: 0.012[ipt]
▶ Tool entry Feed: 0.004[ipt]

ISO Metric

External / Internal





Defined by : R262 (DIN 13)
Tolerance class : 6g/6H

(inch)

Insert Size d	Insert Size L	Pitch (mm)	Designation External		PC9570T	Designation Internal		PC9570T	L1	Tooth	Tool holder
0.236	0.41	0.5		-		TMI	10-0.5ISO	●	0.39	20	TMSR - 10
		0.75		-			10-0.75ISO		0.38	13	
		1.0		-			10-1.0ISO	●	0.35	9	
		1.25		-			10-1.25ISO		0.34	7	
		1.5		-			10-1.5ISO		0.35	6	
1/4	0.43	0.5		-		TM2I	11-0.5ISO		0.39	20	TMSR - 11
		0.75	TM2E	11-0.75ISO			11-0.75ISO	●	0.41	14	
		1.0		11-1.0ISO			11-1.0ISO	●	0.39	10	
		1.25		11-1.25ISO			-		0.39	8	
		1.25		-			11-1.25ISO		0.34	7	
		1.5		11-1.5ISO			-		0.35	6	
		1.5		-			11-1.5ISO	●	0.41	7	
3/8	0.63	0.5		-		TM2I	16-0.5ISO		0.59	30	TMSR - 16
		0.75	TM2E	16-0.75ISO			16-0.75ISO		0.59	20	
		0.8		-			16-0.8ISO		0.57	18	
		1.0		16-1.0ISO			-		0.55	14	
		1.0		-			16-1.0ISO		0.59	15	
		1.25		16-1.25ISO			16-1.25ISO		0.59	12	
		1.5		16-1.5ISO			16-1.5ISO	●	0.59	10	
		1.75		16-1.75ISO			16-1.75ISO		0.55	8	
		2.0		16-2.0ISO			16-2.0ISO	●	0.55	7	
3/8B	0.87	1.0	TM2E	22-1.0ISO		TM2I	22-1.0ISO		0.87	22	TMSR - 22
		1.25		22-1.25ISO			22-1.25ISO		0.84	17	
		1.5		22-1.5ISO			22-1.5ISO	●	0.83	14	
		1.75		22-1.75ISO			22-1.75ISO		0.83	12	
		2.0		22-2.0ISO	●		22-2.0ISO	●	0.87	11	
5/8	1.06	1.0	TM2E	27-1.0ISO		TM2I	27-1.0ISO		1.02	26	TMSR - 27
		1.25		27-1.25ISO			27-1.25ISO		0.98	20	
		1.5		27-1.5ISO			27-1.5ISO	●	1.00	17	
		1.75		27-1.75ISO			27-1.75ISO		0.96	14	
		2.0		27-2.0ISO			27-2.0ISO	●	0.94	12	
		2.5		27-2.5ISO			27-2.5ISO		0.98	10	
		3.0		27-3.0ISO			27-3.0ISO	●	0.94	8	
		3.5		27-3.5ISO			27-3.5ISO		0.96	7	
		4.0		27-4.0ISO			27-4.0ISO	●	0.94	6	
		4.5		27-4.5ISO			27-4.5ISO		0.89	5	
3/4B	1.52	1.5	TM2E	38-1.5ISO		TM2I	38-1.5ISO		1.42	24	TMSR - 38
		2.0		38-2.0ISO			38-2.0ISO		1.42	18	
		3.0		38-3.0ISO			38-3.0ISO		1.42	12	
		4.0		38-4.0ISO			38-4.0ISO		1.26	8	
		4.5		38-4.5ISO			38-4.5ISO		1.24	7	
		5.0		38-5.0ISO			38-5.0ISO		1.18	6	
		5.5		38-5.5ISO			38-5.5ISO		1.30	6	
		6.0		38-6.0ISO			38-6.0ISO		1.18	5	

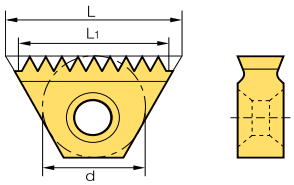
Applicable holders D49

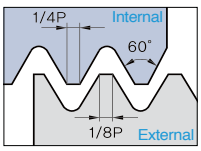
All inserts except TMI10 code have 2 cutting edges

● : Stock item

American UN

External / Internal





Defined by : ANSI B1.1.74
Tolerance class : Class 2A/2B

(inch)

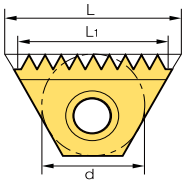
Insert Size		Pitch (tpi)	Designation						L1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
0.236	0.41	32		-		TMI	10-32UN		0.38	12	TMSR - 10
		28		-			10-28UN		0.36	10	
		24		-			10-24UN		0.38	9	
		20		-			10-20UN		0.35	7	
		18		-			10-18UN		0.33	6	
		16		-			10-16UN		0.31	5	
1/4	0.43	48		-		TM2I	11-48UN		0.39	19	TMSR - 11
		40		-			11-40UN		0.40	16	
		32		-			11-32UN		0.41	13	
		28	TM2E	11-28UN			11-28UN		0.39	11	
		27		11-27UN			11-27UN		0.41	11	
		24		11-24UN			11-24UN		0.38	9	
		20		11-20UN			11-20UN		0.40	8	
		18		11-18UN			11-18UN		0.39	7	
		16		11-16UN			11-16UN		0.38	6	
		14		11-14UN			11-14UN		0.36	5	
3/8	0.63	40		-		TM2I	16-40UN		0.58	40	TMSR - 16
		32		-			16-32UN		0.59	32	
		28	TM2E	16-28UN			16-28UN		0.57	28	
		27		16-27UN			16-27UN		0.55	27	
		24		16-24UN			16-24UN		0.58	24	
		20		16-20UN			16-20UN		0.55	20	
		18		16-18UN			16-18UN		0.56	18	
		16		16-16UN			16-16UN		0.56	16	
		14		16-14UN			16-14UN		0.57	14	
		13		16-13UN			16-13UN		0.54	13	
		12		16-12UN			16-12UN	●	0.58	12	
		11.5		16-11.5UN			16-11.5UN		0.52	11.5	
3/8B	0.87	24	TM2E	22-24UN		TM2I	22-24UN		0.83	20	TMSR - 22
		20		22-20UN			22-20UN		0.85	17	
		18		22-18UN			22-18UN		0.83	15	
		16		22-16UN			22-16UN		0.81	13	
		14		22-14UN			22-14UN		0.86	12	
		13		22-13UN			22-13UN		0.85	11	
		12		22-12UN			22-12UN		0.83	10	
5/8	1.06	24	TM2E	27-24UN		TM2I	27-24UN		1.00	24	TMSR - 27
		20		27-20UN			27-20UN		1.00	20	
		18		27-18UN			27-18UN		1.00	18	
		16		27-16UN			27-16UN		1.00	16	
		14		27-14UN			27-14UN		1.00	14	
		13		27-13UN			27-13UN		1.00	13	
		12		27-12UN			27-12UN		1.00	12	
		11.5		27-11.5UN			27-11.5UN		0.96	11	
		11		27-11UN			27-11UN		1.00	11	
		10		27-10UN			-		0.90	9	
		10		-			27-10UN		1.00	10	
		9		27-9UN			27-9UN		0.89	8	
		8		27-8UN			27-8UN		0.88	7	
		7		27-7UN			-		0.86	6	
		7		-			27-7UN		1.00	7	
		6		27-6UN			-		0.83	5	
		6		-			27-6UN		1.00	6	
3/4B	1.52	6	TM2E	38-6UN		TM2I	38-6UN		1.33	8	TMSR - 38
		5		38-5UN			38-5UN		1.20	6	
		4.5		38-4.5UN			38-4.5UN		1.33	6	
		4		38-4UN			38-4UN		1.25	5	

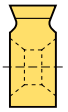
Applicable holders D49

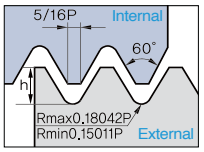
All inserts except TMI10 code have 2 cutting edges

● : Stock item

UNJ (Unified Constant Thread)







Defined by : MIL-S-8879C
Tolerance class : 3A/3B

External / Internal

(inch)

Insert Size		Pitch (tpi)	Designation						L1	Tooth	Tool holder
d	L		External		PC9070T	Internal		PC9070T			
0.236	0.41	24		-		TMI	10-24UNJ		0.38	9	TMSR - 10
		20		-			10-20UNJ		0.35	7	
		18		-			10-18UNJ		0.33	6	
		16		-			10-16UNJ		0.50	8	
1/4	0.43	24	TM2E	11-24UNJ		TM2I	11-24UNJ		0.38	9	TMSR - 11
		20		11-20UNJ			11-20UNJ		0.40	8	
		18		-			11-18UNJ		0.39	7	
		16		11-16UNJ			11-16UNJ		0.38	6	
		14		11-14UNJ			11-14UNJ		0.36	5	
3/8	0.63	24	TM2E	16-24UNJ		TM2I	16-24UNJ		0.58	14	TMSR - 16
		20		16-20UNJ			16-20UNJ		0.55	11	
		18		16-18UNJ			16-18UNJ		0.56	10	
		16		16-16UNJ			16-16UNJ		0.56	9	
		14		16-14UNJ			16-14UNJ		0.57	8	
		13		16-13UNJ			-		0.54	7	
		12		16-12UNJ			16-12UNJ		0.58	7	
5/8	1.06	16	TM2E	27-16UNJ		TM2I	27-16UNJ		1.00	16	TMSR - 27
		12		27-12UNJ			27-12UNJ		1.00	12	
		11		27-11UNJ			27-11UNJ		1.00	11	

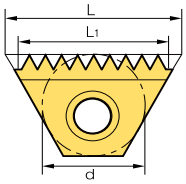
Applicable holders D49

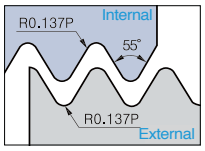
All inserts except TMI10 code have 2 cutting edges

● : Stock item

Whithworth (BSW, BSF, BSP, BSB)

External / Internal





BSW Defined by : B.S.84:1956, DIN 259, ISO228/1:1982
BSP Defind by : B.S.2779:1956
Tolerance class : BSW-Medium class A, BSP-Medium class

(inch)

Insert Size		Pitch (tpi)	Designation			L1	Tooth	Tool holder
d	L		External + Internal		PC9070T			
0.236	0.41	28	TMEI	10-28W		0.36	10	TMSR - 10
		26		10-26W		0.35	9	
		24		10-24W		0.38	9	
		20		10-20W		0.35	7	
		19		10-19W		0.37	7	
1/4	0.43	28	TM2EI	11-28W		0.39	11	TMSR - 11
		26		11-26W		0.38	10	
		24		11-24W		0.38	9	
		20		11-20W		0.40	8	
		19		11-19W		0.37	7	
		14		11-14W		0.36	5	
3/8	0.63	26	TM2EI	16-26W		0.58	15	TMSR - 16
		24		16-24W		0.58	14	
		20		16-20W		0.55	11	
		19		16-19W		0.58	11	
		18		16-18W		0.56	10	
		16		16-16W		0.56	9	
		14		16-14W		0.57	8	
		12		16-12W		0.58	7	
		11		16-11W	●	0.55	6	
3/8B	0.87	24	TM2EI	22-24W		0.83	20	TMSR - 22
		20		22-20W		0.85	17	
		19		22-19W		0.84	16	
		18		22-18W		0.83	15	
		16		22-16W		0.81	13	
		14		22-14W		0.86	12	
		12		22-12W		0.83	10	
		11		22-11W		0.82	9	
5/8	1.06	16	TM2EI	27-16W		1.00	16	TMSR - 27
		14		27-14W		1.00	14	
		12		27-12W		0.92	11	
		11		27-11W		0.91	10	
		10		27-10W		1.00	10	
		9		27-9W		0.89	8	
		8		27-8W		0.88	7	
		7		27-7W		0.66	6	
		6		27-6W		0.83	5	
3/4B	1.52	11	TM2EI	38-11W		1.38	15	TMSR - 38
		6		38-6W		1.33	8	
		5		38-5W		1.20	6	
		4.5		38-4.5W		1.33	6	
		-		38-15W		-	-	

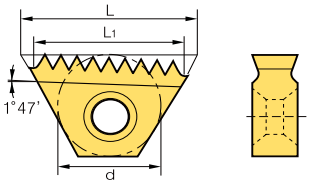
Applicable holders D49

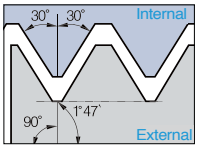
All inserts except TMI10 code have 2 cutting edges

● : Stock item

NPT

External / Internal





Defined by : USAS B2.1:1968
Tolerance class : Standard NPT

(inch)

Insert Size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External + Internal		PC9070T			RH	LH
3/8	0.63	18	TM2E	16-18NPT *		0.56	10	TMSRT - 16	TMSLT - 16
		14	TM2EI	16-14NPT		0.57	8		
		11.5		16-11.5NPT		0.52	6		
3/8B	0.87	14	TM2EI	22-14NPT		0.86	12	TMSRT - 22	TMSLT - 22
5/8	1.06	11.5	TM2EI	27-11.5NPT	●	0.96	11	TMSR - 27	TMSL - 27
		8		27-8NPT	●	0.88	7		
3/4B	1.52	11.5	TM2EI	38-11.5NPT		1.39	16	TMSR - 38	TMSL - 38
		8		38-8NPT		1.25	10		

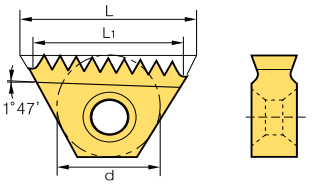
Applicable holders **D49**

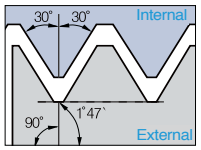
* TM2E16-18NPT is for external threading

● : Stock item

NPTF

External / Internal





Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF

(inch)

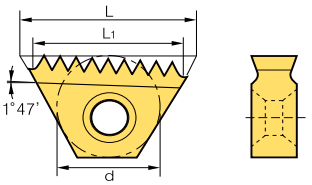
Insert Size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External + Internal		PC9070T			RH	LH
3/8	0.63	14	TM2EI	16-14NPTF	●	0.57	8	TMSRT - 16	TMSLT - 16
		11.5		16-11.5NPTF		0.52	6		
3/8B	0.87	14	TM2EI	22-14NPTF		0.86	12	TMSRT - 22	TMSLT - 22
		11.5		22-11.5NPTF		0.78	9		
5/8	1.06	11.5	TM2EI	27-11.5NPTF		0.96	11	TMSR - 27	TMSL - 27
		8		27-8NPTF		0.88	7		
3/4B	1.52	11.5	TM2EI	38-11.5NPTF		1.39	16	TMSR - 38	TMSL - 38
		8		38-8NPTF		1.25	10		

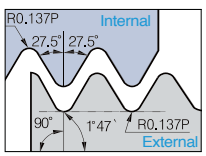
Applicable holders **D49**

● : Stock item

BSPT

External / Internal





Defined by : B.S 21:1985
Tolerance class : Standard BSPT

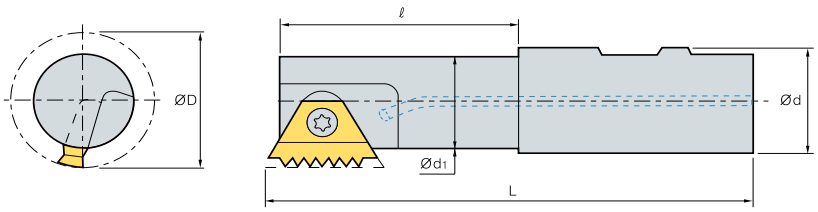
(inch)

Insert Size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External + Internal		PC9070T			RH	LH
1/4	0.43	19	TM2EI	11-19BSPT		0.37	7	TMSR - 10	TMSL - 10
3/8	0.63	14	TM2EI	16-14BSPT		0.57	8	TMSRT - 16	TMSLT - 16
		11		16-11BSPT		0.56	6		
5/8	1.06	11	TM2EI	27-11BSPT		0.91	10	TMSR - 27	TMSL - 27

Applicable holders **D49**

● : Stock item

Standard Type



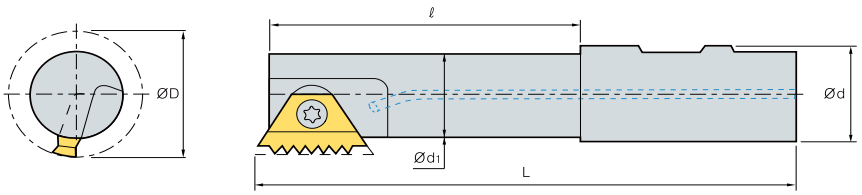
(inch)

Insert Size d	Designation		Stock	ØD	Ød	Ød1	ℓ	L	Screw	Wrench
0.236	TMSR	**050-10**		0.35	0.50	0.27	0.47	2.72	STM10	TW07P
		075-10		0.35	0.75	0.27	0.67	3.50		
1/4	TMSR	**050-11**		0.45	0.50	0.35	0.47	2.75	STM11	TW08P
		075-11		0.45	0.75	0.35	0.79	3.50		
3/8	TMSR	**0625-16**		0.67	0.625	0.54	0.87	3.56	STM1622	TW10P
		075-16		0.79	0.75	0.65	1.69	3.75		
3/8B	TMSR	**0625-22**		0.67	0.625	0.53	1.14	3.15	STM1622	TW10P
		075-22		0.75	0.75	0.61	1.14	3.27		
		100-22		0.75	1.00	0.61	1.18	3.68		
	TMSRW	**100-22**		0.87	1.00	0.73	1.18	3.62		
5/8	TMSR	**100-27**		1.18	1.00	0.94	2.05	4.38	STM27	TW25L
	TMSL	**100-27**		1.18	1.00	0.94	2.05	4.38		
	TMSR	**125-27**		1.46	1.25	1.22	2.28	4.75		
3/4B	TMSR	**125-38**		1.38	1.25	1.06	2.16	4.45	STM38	TW30L
		150-38		1.81	1.50	1.50	2.56	5.25		

Applicable inserts **D44 ~ D48**

● : Stock item

Long Type



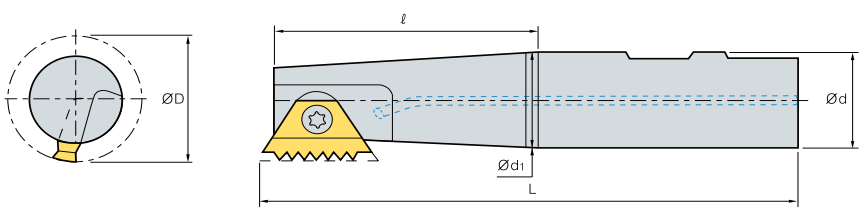
(inch)

Insert Size d	Designation		Stock	ØD	Ød	Ød1	ℓ	L	Screw	Wrench
3/8	TMSRL	**100-16**		0.87	1.00	0.73	0.98	5.00	STM11	TW08P
3/8B	TMSRL	**100-16**		0.87	1.00	0.73	2.50	4.95	STM1622	TW10P
5/8	TMSRL	**075-22**		0.75	0.75	0.61	1.73	3.86	STM1622	TW10P
		100-22		0.87	1.00	0.73	2.50	4.95		
5/8	TMSRL	**100-27**		1.18	1.00	0.94	3.62	5.88	STM27	TW25L
		125-27		1.46	1.25	1.22	3.86	6.33		
3/4B	TMSRL	**150-38**		1.81	1.50	1.50	3.74	6.55	STM38	TW30L

Applicable inserts **D44 ~ D48**

● : Stock item

Tapered Type



(inch)

Insert Size d	Designation		Stock	ØD	Ød	Ød1	ℓ	L	Screw	Wrench
3/8	TMSRT	**0625-16**		0.61	0.625	0.49	0.87	3.56	STM1622	TW10P
		075-16		0.75	0.75	0.59	0.91	3.38	STMT16	
3/8B	TMSRT	**0625-22**		0.67	0.625	0.53	1.14	3.15	STM1622	TW10P
		075-22		0.75	0.75	0.61	1.14	3.27		
5/8	TMSRT	**125-27**		1.46	1.25	1.22	2.28	4.75	STM27	TW25L

Applicable inserts **D44 ~ D48**

Solid Threading Endmills code system

STM D 25 189 L03 - I 1.00 ISO

1	2	3	4	5	6	7	8
Type	Flute style	Shank Dia.	Cutting Dia.	Cutting edge Length	Type of Tool	Pitch	Standard

1 Type

STM D 25 189 L03 - I 1.00 ISO

Solid Threading Endmill

2 Flute style

STM D 25 189 L03 - I 1.00 ISO

HC : Heli Cool

HCR : Heli Radial Cooling

HCC : Heli Cool Chamfering

HCD : Heli Cool C/F & Drilling

D : Deep Threading

3 Shank Dia.

STM D 25 189 L03 - I 1.00 ISO

25 : 0.25

4 Cutting Dia.

STM D 25 189 L03 - I 1.00 ISO

189 : 0.189

5 Cutting edge Length

STM D 25 189 L03 - I 1.00 ISO

L03 : 0.300

6 Type of Tool

STM D 25 189 L03 - I 1.00 ISO

I : Internal E : External

7 Pitch

STM D 25 189 L03 - I 1.00 ISO

mm : 0.35 ~ 3.0 tpi : 72 ~ 12

8 Standard

STM D 25 189 L03 - I 1.00 ISO

ISO Metric

American UN

Cutting edge Length UNJ

Whit Worth (BSW, BSF, BSP, BSB)

National Pipe Thread (NPT)

National Pipe Thread (NPTF)

British Standard Pipe Thread (BSPT)

TM-INFO User Guide

CNC Program Composition

TM-INFO composes CNC program for Thread Milling process in a short time

▶Multilingual

▶Window operation

1 Select thread type

2 Select thread standard

3 Select thread type

4 Input thread parameter

5 Select working way

6 Select tool

7 Confirm the working data & controler

download

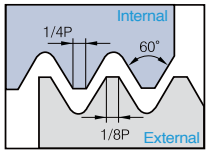
Pls. visit our web-site to download.

http://www.korloy.com

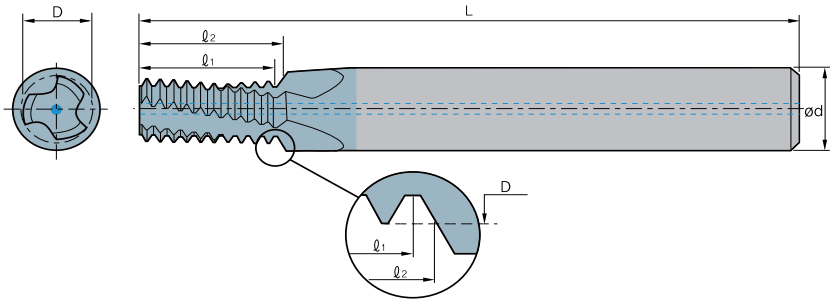
ISO Metric

Helical Flutes with Thru-Hole Coolant

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



(ℓ2≤1.5×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
M3×0.5	M3.5~M16×0.5	0.5	STMHC **19094L01-I0.50ISO**		3/16	0.094	1.772	0.177	0.187	3	9	0.098
M4×0.7		0.7	**19124L02-I0.70ISO**		3/16	0.124	1.772	0.248	0.262	3	9	0.129
M5×0.8		0.8	**19159L02-I0.80ISO**		3/16	0.159	2.244	0.283	0.299	3	9	0.165
M6×1.0	M8~M40×1.0	1.0	**25189L03-I1.00ISO**		1/4	0.189	2.244	0.354	0.374	3	9	0.197
M8×1.25		1.25	**31256L05-I1.25ISO**		5/16	0.256	2.402	0.492	0.524	3	10	0.268
M10×1.5	M12~M48×1.5	1.5	**37323L06-I1.50ISO**		3/8	0.323	2.874	0.591	0.62	3	10	0.335
M12×1.75		1.75	**37370L07-I1.75ISO**		3/8	0.37	2.874	0.689	0.724	4	10	0.405
M14×2.0	M17~M80×2.0	2.0	**50457L08-I2.00ISO**		1/2	0.457	2.874	0.787	0.827	4	10	0.472
M16×2.0	M17~M80×2.0	2.0	**63535L09-I2.00ISO**		5/8	0.535	3.622	0.945	0.984	4	12	0.551

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
M3×0.5	M3.5~M16×0.5	0.5	STMHC **19094L02-I0.50ISO**		3/16	0.094	1.772	0.263	0.246	3	12	0.098
	M4×0.5	0.5	**19126L03-I0.50ISO**		3/16	0.126	1.772	0.315	0.325	3	16	0.138
	M5×0.5	0.5	**25165L04-I0.50ISO**		1/4	0.165	2.244	0.394	0.404	3	20	0.177
M4×0.7		0.7	**19124L03-I0.70ISO**		3/16	0.124	1.722	0.331	0.344	3	12	0.129
	M6×0.75	0.75	**25197L04-I0.75ISO**		1/4	0.197	2.244	0.472	0.487	3	16	0.209
M5×0.8		0.8	**19159L04-I0.80ISO**		3/16	0.159	2.244	0.409	0.425	3	13	0.165
M6×1.0	M8~M40×1.0	1.0	**25189L04-I1.00ISO**		1/4	0.189	2.244	0.472	0.492	3	12	0.197
	M8×1.0	1.0	**31264L06-I1.00ISO**		5/16	0.264	2.402	0.630	0.650	3	16	0.276
	M10×1.0	1.0	**37343L08-I1.00ISO**		3/8	0.343	2.874	0.787	0.807	3	20	0.354
	M12×1.0	1.0	**50421L09-I1.00ISO**		1/2	0.421	2.874	0.945	0.965	4	24	0.433
M8×1.25		1.25	**31256L06-I1.25ISO**		5/16	0.256	2.402	0.640	0.664	3	13	0.268
	M10×1.25	1.25	**37335L08-I1.25ISO**		3/8	0.335	2.874	0.787	0.812	3	16	0.346
M10×1.5	M12~M48×1.5	1.5	**37323L07-I1.50ISO**		3/8	0.323	2.874	0.768	0.797	3	13	0.335
	M12×1.5	1.5	**37370L09-I1.50-ISO**		3/8	0.370	2.874	0.945	0.974	4	16	0.413
	M14×1.5	1.5	**50469L11-I1.50ISO**		1/2	0.469	3.150	1.122	1.152	4	19	0.492
	M16×1.5	1.5	**63547L12-I1.50ISO**		5/8	0.547	3.150	1.240	1.270	4	21	0.571
M12×1.75		1.75	**37370L09-I1.75ISO**		3/8	0.370	2.874	0.965	0.999	4	14	0.405
M14×2.0	M17~M80×2.0	2.0	**50457L11-I2.00ISO**		1/2	0.457	3.150	1.102	1.142	4	14	0.472
M16×2.0	M17~M80×2.0	2.0	**63535L12-I2.00ISO**		5/8	0.535	3.622	1.260	1.299	4	16	0.551
M18×2.5		2.5	**63583L14-I2.50ISO**		5/8	0.583	3.622	1.378	1.427	4	14	0.598
M 20×2.5		2.5	**75673L16-I2.50ISO**		3/4	0.673	4.016	1.575	1.624	4	16	0.687
M 24×3.0		3.0	**75746L19-I3.00ISO**		3/4	0.746	4.016	1.980	1.949	4	16	0.827

* Bore Diameter applies to smallest thread Dia

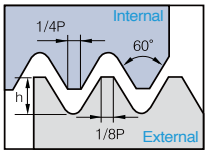
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

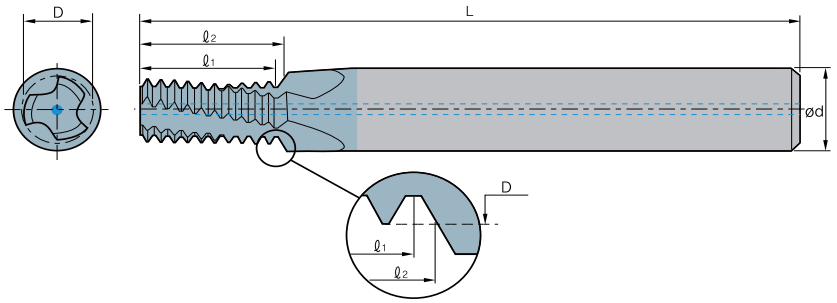
American UN

Helical Flutes with Thru-Hole Coolant

Internal



Defined by : ANSI B1.1.74
Tolerance class : 2B



(ℓ2≤1.5×Thread Diameter)

Thread			Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24	STMHC 19141L03-I24UNC		3/16	0.141	1.722	0.292	0.312	3	7	0.150
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24	25163L03-I24UNC		1/4	0.163	2.244	0.333	0.354	3	8	0.177
1/4″x20	7/16″ ,1/2″x20	3/4″~1″x20	20	25192L03-I20UNC		1/4	0.162	2.244	0.350	0.375	3	7	0.201
5/16″x18	9/16″ ,5/8″x18	11/16″~1 11/16″x18	18	31242L04-I18UNC		5/16	0.242	2.402	0.444	0.472	3	8	0.260
3/8″x16	3/4″x16		16	31301L05-I16UNC		5/16	0.301	2.402	0.563	0.594	3	9	0.315
7/16″x14	7/8″x14		14	37354L06-I14UNC		3/8	0.354	2.874	0.643	0.678	3	9	0.370
1/2″x13			13	50407L08-I13UNC		1/2	0.407	3.150	0.769	0.808	4	10	0.429
9/16″x12	1″~1 1/2″x12		12	50465L08-I12UNC		1/2	0.465	3.150	0.833	0.875	4	10	0.484

(ℓ2≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
	No.10~32	No. 12~3/8″x32	32	STMHC 19150L03-I32UNF		3/16	0.150	1.772	0.375	0.391	3	12	0.157
		No. 12~3/8″x32	32	25173L04-I32UNEF		1/4	0.173	2.244	0.438	0.453	3	14	0.185
	No.12, 1/4″x28	7/16″; 1/2″x28	28	25169L04-I28UNF		1/4	0.169	2.244	0.429	0.446	3	12	0.181
	1/4″x28	7/16″; 1/2″x28	28	25203L05-I28UNF		1/4	0.203	2.244	0.500	0.518	3	14	0.216
		7/16″; 1/2″x28	28	37371L08-I28UNEF		3/8	0.371	2.874	0.857	0.875	3	24	0.401
No.10~24	5/16″, 3/8″x24	9/16″~11/16″x24	24	19141L04-I24UNC		3/16	0.141	1.772	0.375	0.396	3	9	0.150
No.12~24	5/16″, 3/8″x24	9/16″~11/16″x24	24	25163L04-I24UNC		1/4	0.163	2.244	0.417	0.437	3	10	0.177
	5/16″, 3/8″x24	9/16″~11/16″x24	24	31263L06-I24UNF		5/16	0.263	2.402	0.625	0.646	3	15	0.272
	3/8″x24	9/16″~11/16″x24	24	37323L07-I24UNF		3/8	0.323	2.874	0.750	0.771	3	18	0.355
		9/16″~11/16″x24	24	50496L11-I24UNEF		1/2	0.496	3.150	1.125	1.145	4	27	0.520
1/4″x20	7/16″, 1/2″x20	3/4″~1″x20	20	25192L05-I20UNC		1/4	0.192	2.244	0.500	0.525	3	10	0.201
	7/16″, 1/2″x20	3/4″~1″x20	20	37362L08-I20UNF		3/8	0.362	2.874	0.850	0.875	3	17	0.390
	1/2″x20	3/4″~1″x20	20	50437L10-I20UNF		1/2	0.437	3.150	1.000	1.025	3	20	0.453
		3/4″~1″x20	20	75685L15-I20UNEF		3/4	0.685	4.016	1.500	1.525	4	30	0.701
5/16″x18	9/16″, 5/8″x18	11/16″~1 11/16″x18	18	31242L16-I18UNC		5/16	0.242	2.402	0.611	0.639	3	11	0.260
	9/16″, 5/8″x18	11/16″~1 11/16″x18	18	50492L11-I18UNF		1/2	0.492	3.150	1.111	1.139	4	20	0.512
	5/8″x18	11/16″~1 11/16″x18	18	63555L12-I18UNF		5/8	0.555	3.622	1.222	1.250	4	22	0.575
3/8″x16	3/4″x16		16	31301L07-I16UNC		5/16	0.301	2.402	0.750	0.781	3	12	0.315
	3/4″x16		16	75669L15-I16UNF		3/4	0.669	4.016	1.500	1.528	4	24	0.689
7/16″x14	7/8″x14		14	37354L08-I14UNC		3/8	0.354	2.874	0.857	0.893	3	12	0.370
	7/8″x14		14	75746L17-I14UNF		3/4	0.746	4.016	1.714	1.750	4	24	0.807
1/2″x13			13	50407L10-I13UNC		1/2	0.407	3.150	1.000	1.039	4	13	0.430
9/16″x12	1″~1 1/2″x12		12	50465L11-I12UNC		1/2	0.462	3.150	1.084	1.125	4	13	0.484
	1″~1 1/2″x12		12	75746L20-I12UNF		3/4	0.746	4.016	2.000	2.042	4	24	0.925
5/8″x11			11	63516L13-I11UNC		5/8	0.516	3.622	1.273	1.318	4	14	0.539
3/4″x10			10	63622L15-I10UNC		5/8	0.622	3.622	1.500	1.550	4	15	0.657
7/8″x9			9	75746L18-I9UNC		3/4	0.746	4.016	1.778	1.833	4	16	0.768
1″x8			8	75746L20-I8UNC		3/4	0.746	4.016	2.000	2.063	4	16	0.866

* Bore Diameter applies to smallest thread Dia

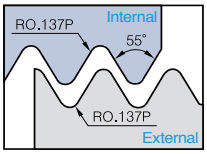
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

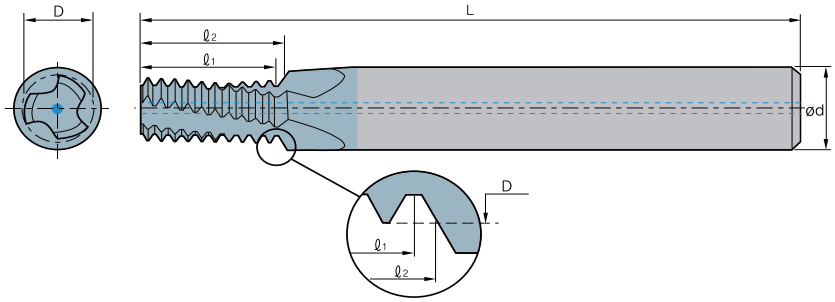
Whitworth

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : B.S.84 : 1956,
DIN 259, ISO228/1 : 1982
Tolerance class : Medium class A



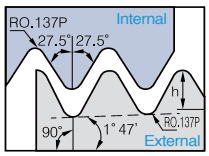
(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
BSW	BSF		External / Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
	1/4″×26	26	STMHC **25197L05-EI26BSF**		1/4	0.197	2.244	0.500	0.519	3	13	0.209
	5/16″×22	22	**31250L06-EI22BSF**		5/16	0.250	2.402	0.636	0.659	3	14	0.264
1/4″×20	3/8″×20	20	**25175L05-EI20BSW**		1/4	0.175	2.244	0.500	0.525	3	10	0.197
	3/8″×20	20	**31301L07-EI20BSF**		5/16	0.301	2.402	0.750	0.775	3	15	0.323
5/16″×18	7/16″×18	18	**25230L06-EI18BSW**		1/4	0.230	2.244	0.611	0.639	3	11	0.256
	7/16″×18	18	**37362L09-EI18BSF**		3/8	0.362	2.874	0.889	0.917	3	16	0.382
3/8″×16	1/2″, 9/16″×16	16	**31283L07-EI16BSW**		5/16	0.283	2.402	0.750	0.781	3	12	0.311
	1/2″, 9/16″×16	16	**50413L10-EI16BSF**		1/2	0.413	2.840	1.000	1.031	4	16	0.437
	9/16″×16	16	**50478L11-EI16BSF**		1/2	0.478	3.150	1.125	1.156	4	18	0.496
7/16″×14	5/8″, 11/16″×14	14	**37335L08-EI14BSW**		3/8	0.335	2.874	0.857	0.893	3	12	0.362
	5/8″, 11/16″×14	14	**63528L12-EI14BSF**		5/8	0.528	3.150	1.214	1.250	4	17	0.551
	11/16″×14	14	**63591L13-EI14BSF**		5/8	0.591	3.622	1.357	1.393	4	19	0.614
1/2″×12	3/4″×12	12	**37362L10-EI12BSW**		3/8	0.362	2.874	1.000	1.042	3	12	0.413
9/16″×12	3/4″×12	12	**50444L11-EI12BSW**		1/2	0.444	3.150	1.083	1.125	4	13	0.476
	3/4″×12	12	**63622L15-EI12BSF**		5/8	0.622	3.622	1.500	1.542	4	18	0.661
5/8″×11	7/8″×11	11	**50496L13-EI11BSW**		1/2	0.496	3.150	1.273	1.318	4	14	0.528
11/16″×11		11	**63559L14-EI11BSW**		5/8	0.559	3.622	1.364	1.409	4	15	0.591

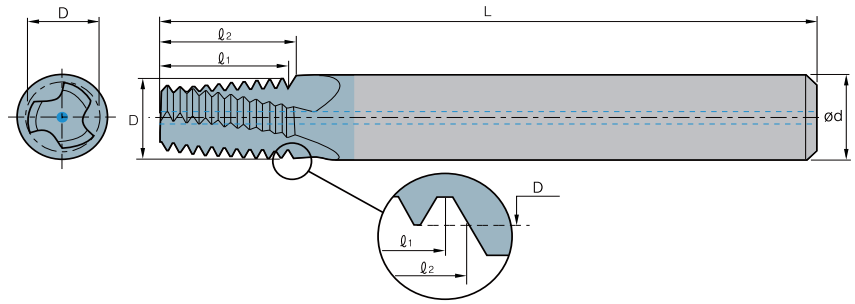
BSPT

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : B.S.21 : 1985
Tolerance class : Standard BSPT



Thread	Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
Standard		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×28	28	STMHC **25232L03-EI28BSPT**		1/4	0.232	2.402	0.393	0.401	3	11	0.264
1/8″×28	28	**31301L03-EI28BSPT**		5/16	0.301	2.402	0.393	0.401	3	11	0.342
1/4″×19	19	**50400L05-EI19BSPT**		1/2	0.400	2.874	0.579	0.605	3	11	0.464
3/8″×19	19	**50439L05-EI19BSPT**		1/2	0.439	2.874	0.579	0.605	4	11	0.598
1/2″, 3/4″×14	14	**63561L08-EI14BSPT**		5/8	0.561	3.150	0.857	0.893	4	12	0.748
1″, 1 1/2″, 2″, 2 1/2″×11	11	**75746L10-EI11BSPT**		3/4	0.746	4.016	1.000	1.136	4	12	1.209

* Bore Diameter applies to smallest thread Dia

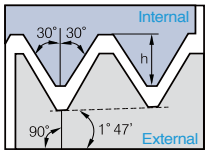
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

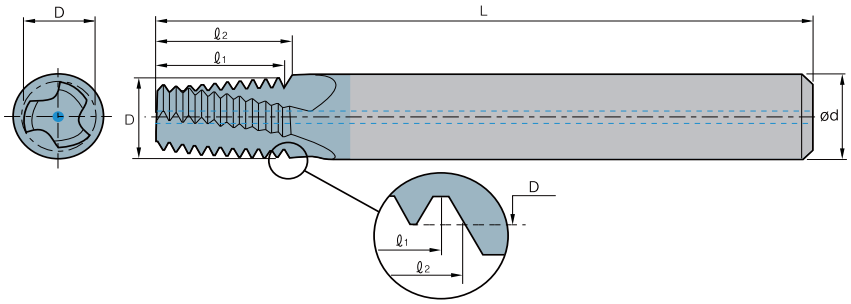
NPT

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : USAS B2.1:1968
Tolerance class : Standard NPT

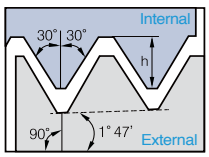


Thread	Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
Standard		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×27	27	STMHC **25232L03-EI27NPT**		1/4	0.232	2.244	0.370	0.389	3	10	0.244
1/8″×27	27	**31301L03-EI27NPT**		5/16	0.301	2.402	0.370	0.389	3	10	0.330
1/4″×18	18	**37370L05-EI18NPT**		3/8	0.370	2.874	0.556	0.583	3	10	0.437
3/8″×18	18	**50439L05-EI18NPT**		1/2	0.439	2.874	0.556	0.583	4	10	0.562
1/2″, 3/4″×14	14	**63561L07-EI14NPT**		5/8	0.561	3.150	0.714	0.750	4	10	0.407,0.905
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5	**75746L09-EI11.5NPT**		3/4	0.746	4.016	0.870	0.913	4	10	1.411, 1.484, 1.732, 2.204
2 1/2″×8 ; 3″×8	8	**75746L13-EI8NPT**		3/4	0.746	4.016	1.250	1.313	4	10	2.625, 3.232

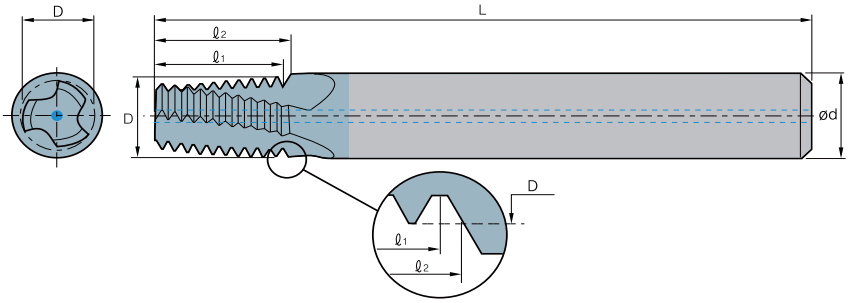
NPTF

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



Thread	Pitch (tpi)	Designation		Dimensions (inch)					No.of Flute	Tooth	*Bore Dia.
Standard		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×27	27	STMHC **25232L03-EI27NPTF**		1/4	0.232	2.244	0.370	0.389	3	10	0.240
1/8″×27	27	**31301L03-EI27NPTF**		5/16	0.301	2.402	0.370	0.389	3	10	0.330
1/4″×18	18	**37370L05-EI18NPTF**		3/8	0.370	2.874	0.556	0.583	3	10	0.437
3/8″×18	18	**50439L05-EI18NPTF**		1/2	0.439	2.874	0.556	0.583	4	10	0.562
1/2″, 3/4″×14	14	**63561L07-EI14NPTF**		5/8	0.561	3.150	0.714	0.750	4	10	0.704, 0.095
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5	**75746L09-EI11.5NPTF**		3/4	0.746	4.016	0.870	0.913	4	10	1.411, 1.484, 1.720, 2.188
2 1/2″×8 ; 3″×8	8	**75746L13-EI8NPTF**		3/4	0.746	4.016	1.250	1.313	4	10	2.610, 3.232

* Bore Diameter applies to smallest thread Dia

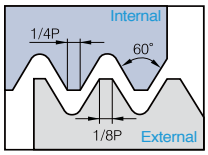
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

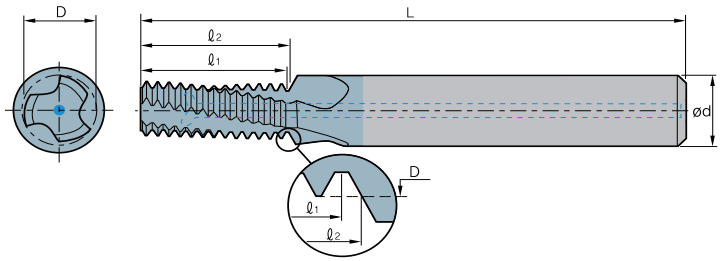
American UN

Helical Flutes with Radial Cooling

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



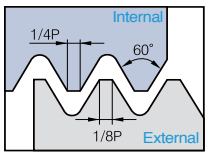
(ℓ2≤2×Thread Diameter)

Thread			Designation		Dimensions (inch)					*Bore Dia.
UNC	UNF	UNEF	Internal		Ød	D	L	ℓ1	ℓ2	inch
	No.10-32	No.12-3/8×32	STMHCR	19150L03-I32UNF	3/16	0.150	1.772	0.375	0.391	0.157
	1/4×28	7/16,1/2×28		25203L05-I28UNF	1/4	0.203	2.244	0.500	0.518	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		19141L04-I24UNC	3/16	0.141	1.772	0.375	0.396	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		19163L04-I24UNC	3/16	0.163	1.772	0.417	0.437	0.177
	5/16, 3/8×24	9/16-11/16×24		31263L06-I24UNF	5/16	0.263	2.402	0.625	0.646	0.272
	3/8×24	9/16-11/16×24		37323L07-I24UNF	3/8	0.323	2.874	0.750	0.771	0.335
1/4×20	7/16×1/2×20	3/4-1×20		25192L05-I20UNC	1/4	0.192	2.244	0.500	0.525	0.201
	1/2×20	3/4-1×20		50437L10-I20UNF	1/2	0.437	3.150	1.000	1.025	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		31242L16-I18UNC	5/16	0.242	2.402	0.611	0.639	0.260
3/8×16	3/4×16			31301L07-I16UNC	5/16	0.301	2.402	0.750	0.781	0.315
7/16×14	7/8×14			37354L08-I14UNC	3/8	0.354	2.874	0.857	0.893	0.370
1/2×13				50407L10-I13UNC	1/2	0.407	3.150	1.000	1.039	0.430
9/16×12	1-1 1/2×12			50465L11-I12UNC	1/2	0.465	3.150	1.084	1.125	0.484

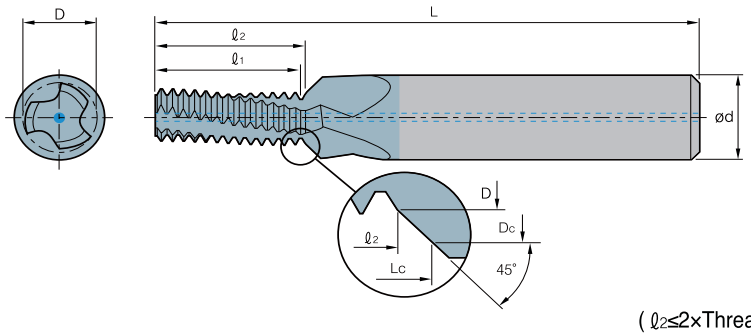
American UN

Helical Flutes with Thru-Hole Coolant - Thru & Chamfer

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



(ℓ2≤2×Thread Diameter)

Thread			Designation		Dimensions (inch)							*Bore Dia.
UNC	UNF	UNEF	Internal		Ød	D	Dc	L	ℓ1	ℓ2	Lc	inch
	No.10-32	No.12-3/8×32	STMHCC	25150L03-I32UNF	1/4	0.150	0.202	2.244	0.375	0.391	0.417	0.157
	1/4×28	7/16,1/2×28		31203L05-I28UNF	5/16	0.203	0.262	2.402	0.500	0.518	0.549	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		25141L04-I24UNC	1/4	0.141	0.202	2.244	0.375	0.396	0.425	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		25163L04-I24UNC	1/4	0.163	0.228	2.244	0.417	0.437	0.468	0.177
	5/16, 3/8×24	9/16-11/16×24		37263L06-I24UNF	3/8	0.263	0.324	2.874	0.625	0.646	0.678	0.272
	3/8×24	9/16-11/16×24		50323L07-I24UNF	1/2	0.323	0.387	3.150	0.750	0.771	0.804	0.335
1/4×20	7/16×1/2×20	3/4-1×20		31192L05-I20UNC	5/16	0.192	0.262	2.402	0.500	0.525	0.558	0.201
	1/2×20	3/4-1×20		63437L10-I20UNF	5/8	0.437	0.512	3.622	1.000	1.025	1.065	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		37242L16-I18UNC	3/8	0.242	0.324	2.874	0.611	0.639	0.676	0.260
3/8×16	3/4×16			50301L07-I16UNC	1/2	0.301	0.387	3.150	0.750	0.781	0.814	0.315
7/16×14	7/8×14			50354L08-I14UNC	1/2	0.354	0.449	3.150	0.857	0.893	0.937	0.370
1/2×13				63407L10-I13UNC	5/8	0.407	0.512	3.622	1.000	1.039	1.087	0.430
9/16×12	1-1 1/2×12			63465L11-I12UNC	5/8	0.465	0.574	3.622	1.084	1.125	1.178	0.484

* Bore Diameter applies to smallest thread Dia

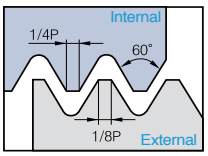
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

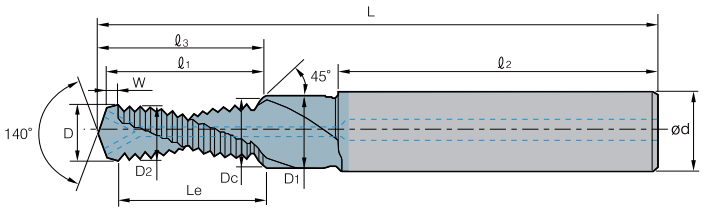
ISO Metric

Drill, Chamfer & Thread with Thru-Hole Coolant

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



Thread	Pitch (mm)	Designation		Dimensions (inch)											No.of Flute	Tooth
ISO 2D **M Coarse**		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD- **IM6×1.0ISO-2D**		2.441	0.571	0.539	1.417	0.039	0.500	0.197	0.315	0.260	0.248	0.191	2	11
M8×1.25	1.25	**IM8×1.25ISO-2D**		2.913	0.717	0.673	1.575	0.051	0.622	0.268	0.394	0.354	0.327	0.254	2	11
M10×1.5	1.5	**IM10×1.5ISO-2D**		3.11	0.921	0.87	1.772	0.059	0.811	0.335	0.472	0.433	0.406	0.318	2	12
M12×1.75	1.75	**IM12×1.75ISO-2D**		3.504	1.067	1.004	1.772	0.059	0.945	0.406	0.551	0.531	0.484	0.383	2	12

Thread	Pitch (mm)	Designation		Dimensions (inch)											No.of Flute	Tooth
ISO 2.5D **M Coarse**		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD- **IM6×1.0ISO-2.5D**		2.441	0.650	0.618	1.417	0.039	0.579	0.197	0.315	0.260	0.248	0.191	2	13
M8×1.25	1.25	**IM8×1.25ISO-2.5D**		2.973	0.913	0.870	1.575	0.051	0.819	0.268	0.394	0.354	0.327	0.254	2	15
M10×1.5	1.5	**IM10×1.5ISO-2.5D**		3.110	1.098	1.047	1.772	0.059	0.988	0.335	0.472	0.433	0.406	0.318	2	15

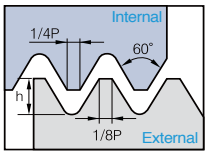
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

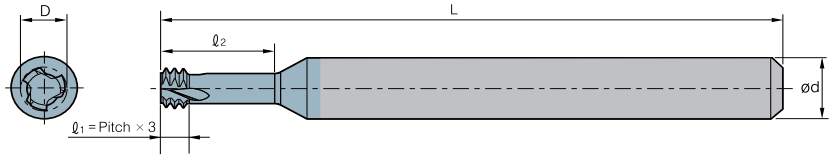
● : Stock item

ISO Metric

Deep Threading

Internal





Defined by : R262 (DIN 13)
Tolerance class : 6H

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
M1.6×0.35		0.35	STMD3T **12047L134-I0.35ISO**		1/8	0.047	1.181	0.134	3	3	0.049
M2×0.4		0.4	**25061L165-I0.4ISO**		1/4	0.061	2.244	0.165	3	3	0.063
M2.2×0.45		0.45	**25065L181-I0.45ISO**		1/4	0.065	2.244	0.181	3	3	0.069
M2.5×0.45		0.45	**25077L205-I0.45ISO**		1/4	0.077	2.244	0.205	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5	**25094L244-I0.5ISO**		1/4	0.094	2.244	0.244	3	3	0.098
M3.5×0.6		0.6	**25108L287-I0.6ISO**		1/4	0.108	2.244	0.287	3	3	0.114
M4×0.7		0.7	**25124L327-I0.7ISO**		1/4	0.124	2.244	0.327	3	3	0.130
M5×0.8		0.8	**25159L409-I0.8ISO**		1/4	0.159	2.244	0.409	3	3	0.165
M6×1.0	M8~M40×1.0	1.0	**25189L492-I1.0ISO**		1/4	0.189	2.244	0.492	3	3	0.197
M8×1.25		1.25	**31256L654-I1.25ISO**		5/16	0.256	2.480	0.654	3	3	0.268
M10×1.5	M12~M48×1.50	1.5	**37323L819-I1.50ISO**		3/8	0.323	2.874	0.819	3	3	0.335
M12×1.75		1.75	**37371L984-I1.75ISO**		3/8	0.371	2.874	0.984	3	3	0.406

3d (ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
M1.6×0.35		0.35	STMD3T **12047L197-I0.35ISO**		1/8	0.047	1.187	0.197	3	3	0.079
M2×0.4		0.4	**25061L244-I0.4ISO**		1/4	0.061	2.244	0.244	3	3	0.063
M2.5×0.45		0.45	**25077L276-I0.45ISO**		1/4	0.077	2.244	0.276	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5	**25094L362-I0.5ISO**		1/4	0.094	2.244	0.362	3	3	0.098
M4×0.7		0.7	**25124L484-I0.7ISO**		1/4	0.124	2.244	0.484	3	3	0.130
M5×0.8		0.8	**25159L606-I0.8ISO**		1/4	0.159	2.244	0.606	3	3	0.165
M6×1.0	M8~M40×1.0	1.0	**25189L728-I1.0ISO**		1/4	0.189	2.244	0.728	3	3	0.197
M8×1.25		1.25	**31256L969-I1.25ISO**		5/16	0.256	2.48	0.969	3	3	0.268

* Bore Diameter applies to smallest thread Dia

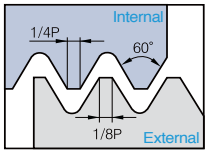
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

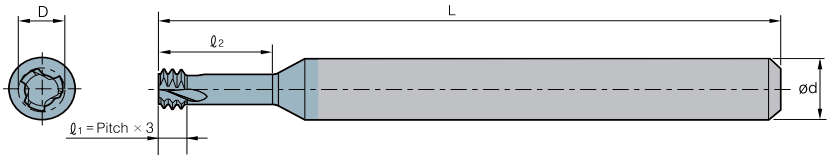
● : Stock item

American UN

Deep Threading

Internal





Defined by : ANSI B1.1.74
Tolerance class : 2B

(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
UNC	UNF		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
	No.1~72	72	STMD3T 25057L154-I72UN		1/4	0.057	2.244	0.154	3	3	0.059
No.1~64	No.2~64	64	25055L165-I64UN		1/4	0.055	2.244	0.165	3	3	0.059
No.2~56	No.3~56	56	25065L197-I56UN		1/4	0.065	2.244	0.197	3	3	0.071
No.3~48	No.4~48	48	25075L236-I48UN		1/4	0.075	2.244	0.263	3	3	0.079
No.4, No.5~40	No.6~40	40	25083L236-I40UN		1/4	0.083	2.244	0.236	3	3	0.090
No.5~40	No.6~40	40	25096L283-I40UN		1/4	0.096	2.244	0.283	3	3	0.102
	No.8~36	36	25130L343-I36UN		1/4	0.130	2.244	0.343	3	3	0.138
No.6, No.8~32	No.10~32	32	25100L292-I32UN		1/4	0.100	2.244	0.292	3	3	0.110
No.8~32	No.10~32	32	25126L394-I32UN		1/4	0.126	2.244	0.394	3	3	0.134
	1/4″×28	28	25207L520-I28UN		1/4	0.207	2.244	0.520	3	3	0.216
No.10~24	5/16″×24	24	25141L402-I24UN		1/4	0.141	2.244	0.402	3	3	0.150
	5/16″×24	24	31263L650-I24UN		5/16	0.263	2.480	0.650	3	3	0.272
1/4″×20	7/16″×20	20	25192L528-I20UN		1/4	0.192	2.244	0.528	3	3	0.201
	7/16″×20	20	37375L906-I20UN		3/8	0.375	2.874	0.906	3	3	0.390
3/8″×16		16	31264L752-I16UN		5/16	0.264	2.480	0.752	3	3	0.315
7/16″×14		14	7354L917-I14UN		3/8	0.354	2.874	0.917	3	3	0.370

(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
UNC	UNF		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
	No.1~72	72	STMD3T 25057L226-I72UN		1/4	0.057	2.244	0.226	3	3	0.059
No.4, No.5~40	No.6~40	40	25083L354-I40UN		1/4	0.083	2.244	0.354	3	3	0.091
No.5~40	No.6~40	40	25096L394-I40UN		1/4	0.096	2.244	0.394	3	3	0.102
No.6, No.8~32	No.10~32	32	25100L433-I32UN		1/4	0.100	2.244	0.433	3	3	0.110
No.8~32	No.10~32	32	25126L512-I32UN		1/4	0.126	2.244	0.512	3	3	0.134
	1/4″ 28	28	25207L772-I28UN		1/4	0.207	2.244	0.772	3	3	0.216
	5/16″×24	24	31263L965-I24UN		5/16	0.263	2.480	0.965	3	3	0.272
1/4″×20	7/16″×20	20	25192L780-I20UN		1/4	0.192	2.244	0.780	3	3	0.201

* Bore Diameter applies to smallest thread Dia

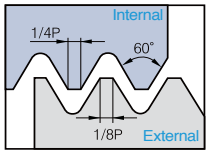
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

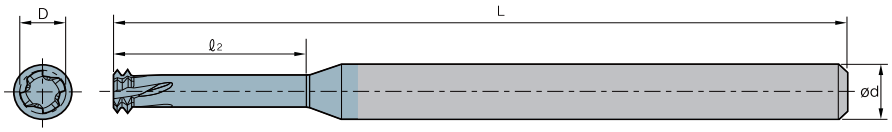
● : Stock item

ISO Metric

Deep Threading for Hard Materials(~HRC62)

Internal





Defined by : R262 (DIN 13)
Tolerance class : 6H

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
M2×0.4		0.4	STMD2L **25061L165-I0.4ISO**		1/4	0.061	2.99	0.18	4	2	0.063
M2.2×0.45		0.45	**25065L181-I0.45ISO**		1/4	0.065	2.99	0.20	4	2	0.070
M2.5×0.45		0.45	**25077L204-I0.45ISO**		1/4	0.077	2.99	0.22	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5	**25094L244 -I0.5ISO**		1/4	0.094	2.99	0.27	4	2	0.101
M3.5×0.6		0.6	**25108L287-I0.6ISO**		1/4	0.108	2.99	0.31	4	2	0.116
M4×0.7		0.7	**25124L326-I0.7ISO**		1/4	0.124	2.99	0.36	4	2	0.128
M5×0.8		0.8	**25159L409-I0.8ISO**		1/4	0.159	2.99	0.44	4	2	0.169
M6×1.0	M8~M40×1.0	1.0	**25189L492-I1.0ISO**		1/4	0.189	2.99	0.53	4	2	0.201
M8×1.25		1.25	**31256L653-I1.25ISO**		5/16	0.256	3.15	0.70	4	2	0.268
M10×1.5	M12~M48×1.50	1.5	**31308L818-I1.5ISO**		5/16	0.308	3.15	0.88	4	2	0.339
M12×1.75		1.75	**37371L984-I1.75ISO**		3/8	0.371	3.98	1.05	4	2	0.406

(ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
M2×0.4		0.4	STMD2L **25061L244-I0.4ISO**		1/4	0.061	2.99	0.26	4	2	0.063
M2.2×0.45		0.45	**25077L303-I0.45ISO**		1/4	0.077	2.99	0.32	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5	**25094L362-I0.5ISO**		1/4	0.094	2.99	0.38	4	2	0.101
M4×0.7		0.7	**25124L484-I0.7ISO**		1/4	0.124	2.99	0.51	4	2	0.128
M5×0.8		0.8	**25159L606-I0.8ISO**		1/4	0.159	2.99	0.64	4	2	0.169
M6×1.0	M8~M40×1.0	1.0	**25189L728-I1.0ISO**		1/4	0.189	2.99	0.77	4	2	0.201
M8×1.25		1.25	**31256L968-I1.25ISO**		5/16	0.256	3.15	1.02	4	2	0.268

* Bore Diameter applies to smallest thread Dia

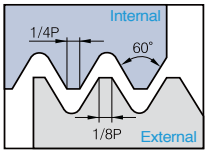
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

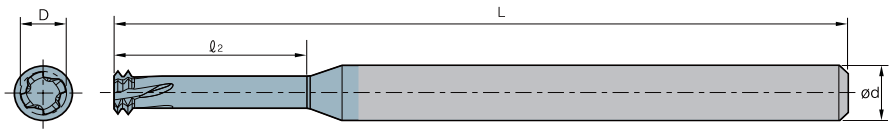
● : Stock item

American UN

Deep Threading for Hard Materials(~HRC62)

Internal





Defined by : ANSI B1.1.74
Tolerance class : 2B

(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
UNC	UNF		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
No.2~56	No.3~56	56	STMD2L **25065L197-I56UN**		1/4	0.065	3.00	0.21	4	2	0.070
No.3~48	No.4~48	48	**25075L236-I48UN**		1/4	0.075	3.00	0.26	4	2	0.093
No.4~40 ; No.5-40	No.6~40	40	**25083L236-I40UN**		1/4	0.083	3.00	0.26	4	2	0.093
No.5~40	No.6~40	40	**25096L283-I40UN**		1/4	0.096	3.00	0.31	4	2	0.116
	No.8~36	36	**25130L343-I36UN**		1/4	0.130	3.00	0.37	4	2	0.140
No.6~32 ; No.8~32	No.10~32	32	**25100L292-I32UN**		1/4	0.100	3.00	0.32	4	2	0.161
No.8~32	No.10~32	32	**25126L394-I32UN**		1/4	0.126	3.00	0.42	4	2	0.136
	1/4″×28	28	**25207L520-I28UN**		1/4	0.207	3.00	0.56	4	2	0.219
No.10~24	5/16″×24	24	**25141L402-I24UN**		1/4	0.141	3.00	0.44	4	2	0.154
	5/16″×24	24	**31263L650-I24UN**		5/16	0.263	3.15	0.69	4	2	0.277
1/4″×20	7/16″×20	20	**25192L528-I20UN**		1/4	0.192	3.00	0.58	4	2	0.204
	7/16″×20	20	**37376L906-I20UN**		3/8	0.376	4.00	0.96	4	2	0.390
3/8″×16		16	**31301L776-I16UN**		5/16	0.301	3.15	0.84	4	2	0.316
7/16″×14		14	**37354L917-I14UN**		3/8	0.354	4.00	0.99	4	2	0.375
1/2″×13		13	**37390L101 -I13UN**		3/8	0.390	4.00	1.08	4	2	0.422

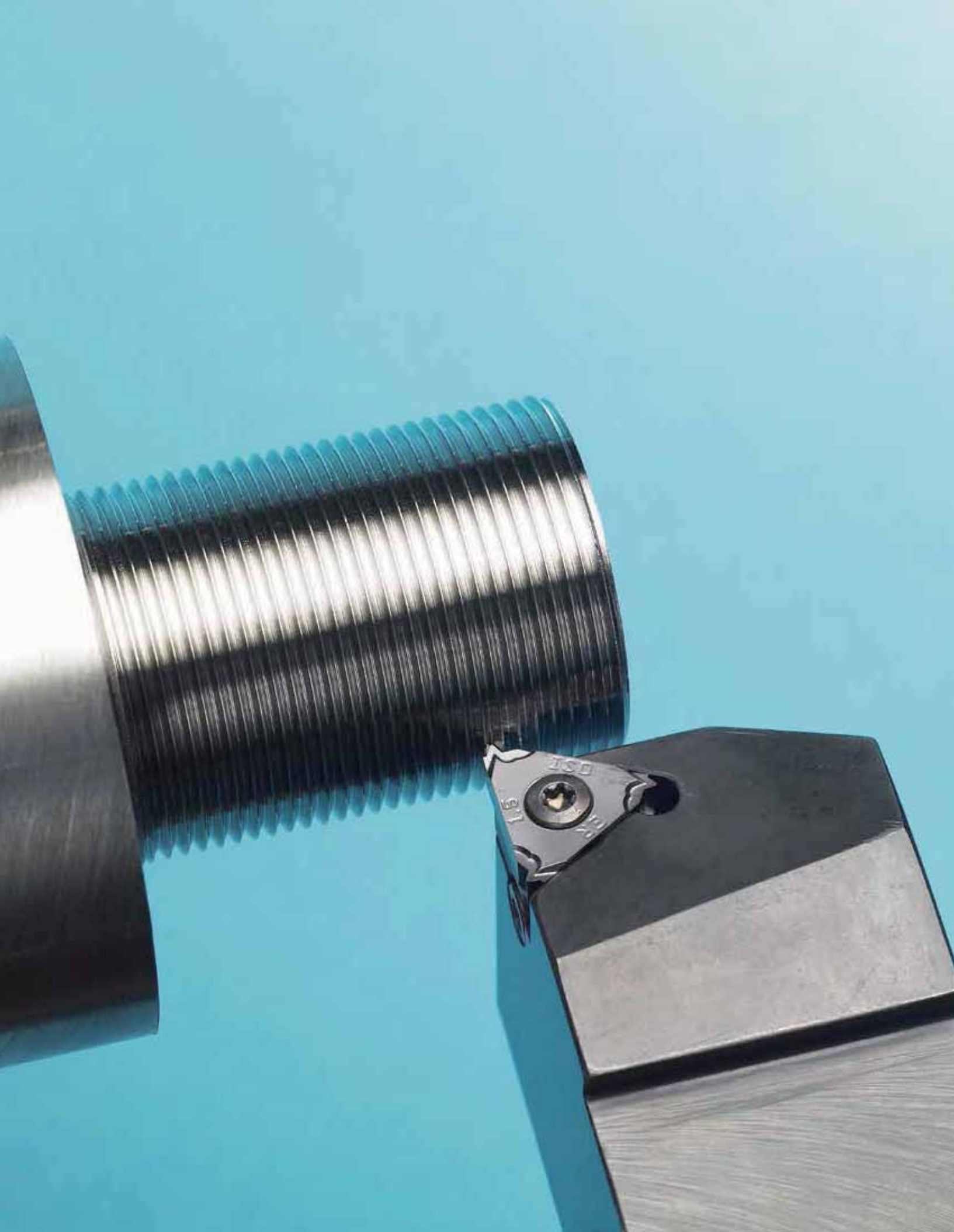
(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation		Dimensions (inch)				No.of Flute	Tooth	*Bore Dia.
UNC	UNF		Internal	PC9070M	Ød	D	L	ℓ2	z	zt	inch
No.4~40, No.5~40	No.6~40	40	STMD2L **25083L354-I40UN**		1/4	0.083	3	0.38	4	2	0.093
No.5~40	No.6~40	40	**25096L394-I40UN**		1/4	0.096	3	0.41	4	2	0.104
No.6~32, No.8~32	No.10~32	32	**25100L433-I32UN**		1/4	0.1	3	0.46	4	2	0.111
No.8~32	No.10~32	32	**25126L512-I32UN**		1/4	0.126	3	0.54	4	2	0.136
	1/4″×28	28	**25207L772-I28UN**		1/4	0.207	3	0.81	4	2	0.219
	5/16″×24	24	**31263L965-I24UN**		5/16	0.263	3.15	1.01	4	2	0.272
1/4″~20	7/16″×20	20	**25192L780-I20UN**		1/4	0.192	3	0.83	4	2	0.204
7/16″×14		14	**37354L131-I14UN**		3/8	0.354	4	1.39	4	2	0.375

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item



Milling Insert

Face Milling Cutters

Cutters for Molds

Cutters for Molds

Milling Cutters for Aluminum

Side Milling Cutters

Milling Cutter for Cast iron at high feed

Gear Tools

MILLING

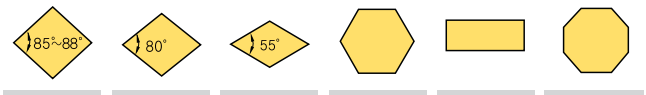
Milling tools that provide the best quality for customers' need and improve productivity.

S P K R 4

1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed circle

1 Insert Shape

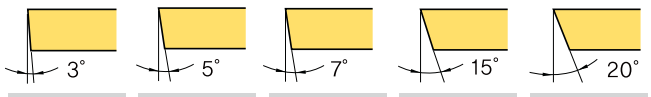
S P K R 4 3 ED2 S R - MX



A	C	D	H	L	O
R	S	T	V	W	

2 Relief Angle

S P K R 4 3 ED2 S R - MX

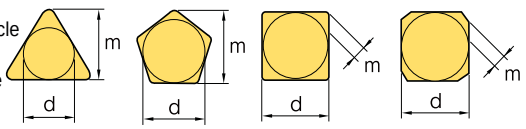


A	B	C	D	E
F	G	N	P	

3 Tolerance

S P K R 4 3 ED2 S R - MX

d : Inscribed Circle
t : Thickness
m : refer to figure



(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.05 ~ ±0.15	±0.005	±0.025
K	±0.05 ~ ±0.15	±0.013	±0.025
L	±0.05 ~ ±0.15	±0.025	±0.025
M	±0.05 ~ ±0.15	±0.08 ~ ±0.20	±0.13
U	±0.08 ~ ±0.25	±0.13 ~ ±0.38	±0.13

■ Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (exceptional case)

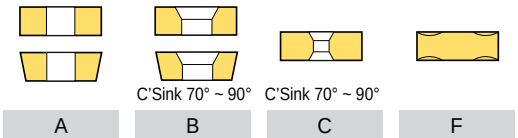
d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

Tolerance on D Insert Shape (exceptional case)

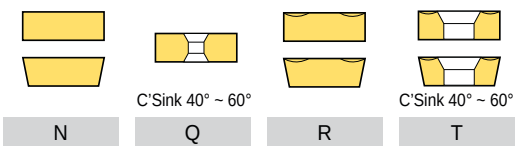
d	Tolerance on d	Tolerance on m
6.35	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

4 Cross Section Type

S P K R 4 3 ED2 S R - MX



A	B	C	F
G	H	J	M

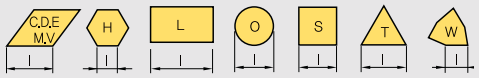


N	Q	R	T
U	W	X	

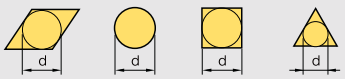
5 Cutting Edge Length, Diameter of Inscribed circle

S P K R 4 3 ED2 S R - MX

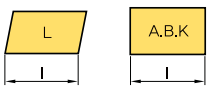
■ Metric system ※ Decimal integer constant



■ Inch system



· Use 1/32″ unit for a insert having smaller I.C under 1/4″
· Use 1/8″ unit for a insert having larger I.C over 1/4″



※ In case of rectangular and rhombic insert indicate cutting edge length instead of inscribed circle.

■ Cross over chart for “Metric” and “Inch” system

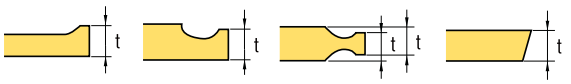
△	06	09	11	16	22	27	33	44
○ □	03	05	06	09	12	15	19	25
55°	04	06	07	11	15	19	23	31
80°	03	05	06	09	12	16	19	25
Inscribed circle	5/32″	7/32″	1/4″	3/8″	1/2″	5/8″	3/4″	1″
Inch system	5	7	2(8)	3	4	5	6	8

3 ED2 S R - MX

6	7	8	9	10
Height of Cutting Edge	Nose Radius (Nose R)	Edge Preparation	Hand	Chip Breaker for Milling

6 Height of Cutting Edge

S P K R 4 **3** ED2 S R - MX

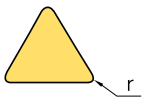


Symbol		Height of cutting edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8(16)	12.70	1/2

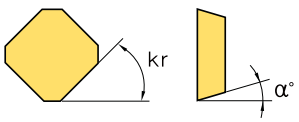
( ) Symbol for small size insert

7 Nose Radius (Nose R)

S P K R 4 3 ED2 S R - MX



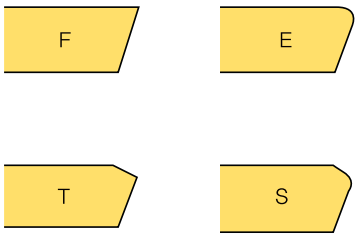
r		Symbol		r		Symbol	
mm	Inch	mm	Inch	mm	Inch	mm	Inch
00	0	0.0		12	3	1.2	3/64
02		0.2		15		1.5	
04	1	0.4	1/64	16	4	1.6	4/64
05		0.5		24	6	2.4	6/64
08	2	0.8	2/64	32	8	3.2	8/64
10		1.0		40		4.0	



Parallel Land	Relief Angle	
kr	α°	
A - 45°	A - 3°	F - 25°
D - 60°	B - 5°	G - 30°
E - 75°	C - 7°	N - 0°
F - 85°	D - 15°	P - 11°
P - 90°	E - 20°	
Z - Special		

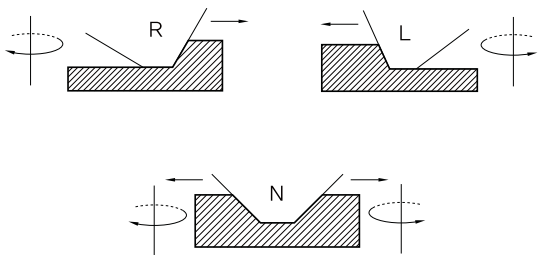
8 Edge Preparation

S P K R 4 3 ED2 S R - MX



9 Hand

S P K R 12 3 ED2 S R - MX



10 Chip Breaker for Milling

S P K R 4 3 ED2 S R - MX

MA MF MM MX

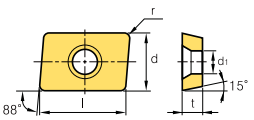
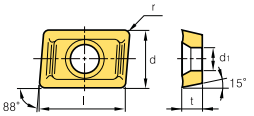
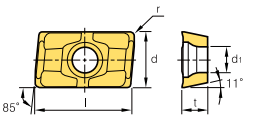
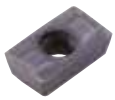
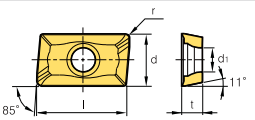
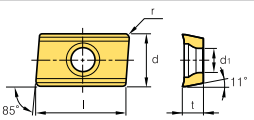
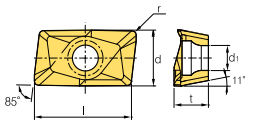
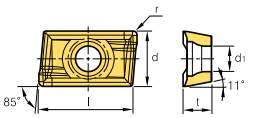
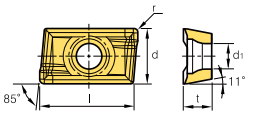
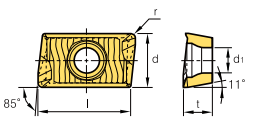
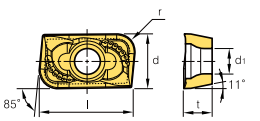
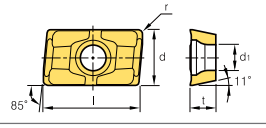
MF MM MR MA

MA MF MM ML

Workpiece			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⬢	⬢	✱	⬢	⬢	✱			✱	✱	⬢		
	Stainless steel	M			⬢	✱			✱	✱		✱	✱			
	Cast iron	K									●	✱	✱		⬢	●
	Non-ferrous metal	N														⬢
	Heat resistant alloy, Titanium alloy	S							✱			✱	✱			
	Hardened steel	H										⬢	✱			

Machining types

● Continuous cutting
⬢ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
ADKA	**150308R**															0.591	0.375	0.125	0.031	0.177		-
	**150308SR**															0.591	0.375	0.125	0.031	0.177		
	150308TR		●													0.591	0.375	0.125	0.031	0.177		
ADLT	**150308R**			●							●					0.591	0.375	0.125	0.031	0.177		E209
	**150308SR**				●											0.591	0.375	0.125	0.031	0.177		
	150308TR															0.591	0.375	0.125	0.031	0.177		
APFT-X22	**1604PDSR-X22**															0.646	0.375	0.187	0.031	0.173		E120 E132
	**1604PDTR-X22**															0.646	0.375	0.187	0.031	0.173		
APKT	**1604PDSR**			●		●				●						0.646	0.375	0.187	0.031	0.173		E120 E132
																						
APKT-MA	**1604PDFR-MA**														●	0.646	0.375	0.187	1/128	0.173		E120 E132
																						
APKT-MA2	**1604PDFR-MA2**														●	0.650	0.375	0.227	0.031	0.177		E120 E132
	**160416FR-MA2**															0.650	0.375	0.227	0.063	0.177		
	160432FR-MA2															0.650	0.375	0.227	0.126	0.177		
APKT-MA3	**1604PDFR-MA3**														● ●	0.646	0.375	0.197	0.031	0.173		E120 E132
	**160420FR-MA3**															0.646	0.375	0.197	0.079	0.173		
APKT-MF	**1604PDSR-MF**			●							●					0.646	0.375	0.197	0.031	0.173		E120 E132 E139
																						
APKT-MM	**1604PDSR-MM**			●	●	●		●	●	●	●					0.646	0.375	0.205	0.031	0.173		E120 E132 E139
																						
APKT-MM1	**160432R-MM1**			●												0.634	0.375	0.187	0.126	0.173		E120 E132
																						
APKT-X22	**1604PDSR-X22**			●												0.646	0.375	0.187	0.031	0.173		E120 E132
	**1604PDTR-X22**															0.646	0.375	0.187	0.031	0.173		

● : Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

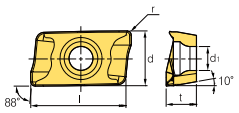
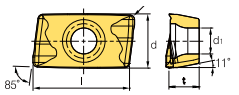
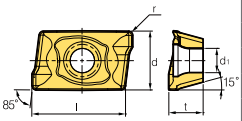
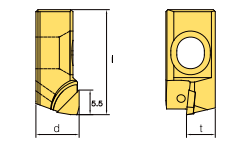
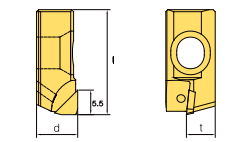
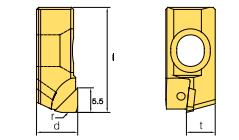
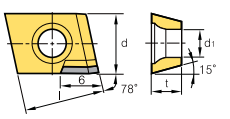
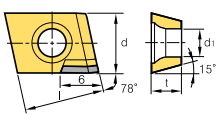
Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	
APLT	070304R										●					0.295	0.250	0.125	0.016	0.110		E197
APMT-MA (New)	0602PDFR-MA														●	0.236	0.167	0.102	0.016	0.079		E116~E119
	060208PDFR-MA															0.236	0.167	0.102	0.031	0.079		E121~E131
	0903PDFR-MA														●	0.370	0.244	0.142	0.016	0.110		E133~E136
	090308PDFR-MA															0.370	0.244	0.142	0.031	0.110		E137~E142
	11T3PDFR-MA														●	0.441	0.255	0.142	0.020	0.114		
	11T308PDFR-MA															0.441	0.255	0.142	0.031	0.114		
	160404PDFR-MA															0.650	0.370	0.227	0.016	0.177		
	1604PDFR-MA														●	0.650	0.370	0.227	0.031	0.177		
	180604PDFR-MA															0.685	0.432	0.250	0.016	0.177		
	1806PDFR-MA														●	0.685	0.432	0.250	0.031	0.177		
	180612PDFR-MA															0.685	0.432	0.250	0.047	0.177		
	180616PDFR-MA															0.685	0.432	0.250	0.063	0.177		
	180620PDFR-MA															0.685	0.432	0.250	0.079	0.177		
	180624PDFR-MA															0.685	0.432	0.250	0.095	0.177		
	180630R-MA															0.685	0.432	0.250	0.118	0.177		
APMT-MF	11T3PDSR-MF			●	●	●	●			●	●	●				0.441	0.255	0.142	0.020	0.112		E116~E142
	1604PDSR-MF			●	●	●	●			●	●	●				0.646	0.370	0.227	0.031	0.177		
	1806PDSR-MF				●		●			●	●	●				0.685	0.432	0.250	0.031	0.177		
	180612PDSR-MF															0.685	0.432	0.250	0.047	0.177		
APMT-ML (New)	0903PDER-ML										●	●				0.370	0.244	0.142	0.016	0.110		E117~E119
	090308PDER-ML															0.370	0.244	0.142	0.031	0.110		E121
	11T3PDER-ML										●	●				0.441	0.255	0.142	0.020	0.114		E124~E126
	11T308PDER-ML															0.441	0.255	0.142	0.031	0.114		E128~E131
	160404PDER-ML															0.650	0.370	0.227	0.016	0.177		E129~E131
	1604PDER-ML										●	●				0.650	0.370	0.227	0.031	0.177		E133~E134
	180604PDER-ML											●				0.685	0.432	0.250	0.016	0.177		E137~E139
	1806PDER-ML										●	●				0.685	0.432	0.250	0.031	0.177		E139~E142
	180612PDER-ML										●	●				0.685	0.432	0.250	0.047	0.177		
	180616PDER-ML										●	●				0.685	0.432	0.250	0.063	0.177		
	180620PDER-ML											●				0.685	0.432	0.250	0.079	0.177		
	180624PDER-ML										●	●				0.685	0.432	0.250	0.095	0.177		
	180630R-ML										●	●				0.685	0.432	0.250	0.118	0.177		
APMT-MM	060202PDSR-MM				●	●					●	●				0.236	0.167	0.102	0.008	0.079		E116~E142
	0602PDSR-MM				●	●	●	●	●	●	●	●				0.236	0.167	0.102	0.016	0.079		
	060208PDSR-MM				●	●	●				●	●				0.236	0.167	0.102	0.031	0.079		
	060212R-MM				●	●	●				●	●				0.236	0.167	0.102	0.047	0.079		
	060216R-MM					●	●				●	●				0.236	0.167	0.102	0.063	0.079		
	0903PDSR-MM				●	●	●	●		●	●	●				0.370	0.244	0.142	0.016	0.110		
	090306PDSR-MM															0.370	0.244	0.142	0.024	0.110		
	090308PDSR-MM				●	●	●				●	●				0.370	0.244	0.142	0.031	0.110		
	090312R-MM						●				●	●				0.370	0.244	0.142	0.047	0.110		
	090316R-MM				●	●	●				●	●				0.370	0.244	0.142	0.063	0.110		
	090320R-MM					●	●				●	●				0.362	0.244	0.142	0.079	0.110		
	090331R-MM															0.362	0.244	0.142	0.122	0.110		
	090332R-MM						●				●	●				0.362	0.244	0.142	0.126	0.110		

● : Stock item

Workpiece			CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200
	Steel	P	●	⬬	⬬	✱	⬬	⬬	✱			✱	✱			
	Stainless steel	M			⬬	✱			✱	✱		✱	✱			
	Cast iron	K									●	✱	✱	●		
	Non-ferrous metal	N												⬬	●	●
	Heat resistant alloy, Titanium alloy	S							✱			✱	✱			
	Hardened steel	H										⬬	✱			

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated									Uncoated	PCD		Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1	C		
APMT-MM 	11T3PDSR-MM			●	●	●	●	●	●	●	●	●				0.441	0.255	0.142	0.020	0.112	-		E116~E142
	11T308PDSR-MM			●	●	●	●		●		●	●				0.441	0.255	0.142	0.031	0.112	-		
	11T312PDSR-MM			●	●	●	●		●		●	●				0.441	0.255	0.142	0.047	0.112	-		
	11T316R-MM			●	●	●	●				●	●				0.433	0.255	0.142	0.063	0.112	-		
	11T318R-MM															0.433	0.255	0.142	0.071	0.112	-		
	11T324R-MM				●	●	●				●	●				0.433	0.255	0.142	0.094	0.112	-		
	1604PDSR-MM			●	●	●	●	●	●	●	●	●				0.646	0.370	0.227	0.031	0.177	-		
	160410PDSR-MM			●			●				●	●				0.646	0.370	0.227	0.039	0.177	-		
	160416PDSR-MM			●	●	●	●				●	●				0.646	0.370	0.227	0.063	0.177	-		
	160424R-MM				●	●	●				●	●				0.630	0.370	0.227	0.094	0.177	-		
	160430R-MM						●				●	●				0.630	0.370	0.227	0.118	0.177	-		
	160432R-MM			●	●	●	●				●	●				0.630	0.370	0.227	0.126	0.177	-		
	160450R-MM						●				●	●				0.630	0.370	0.227	0.197	0.177	-		
	160464R-MM						●				●	●				0.630	0.370	0.227	0.252	0.177	-		
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				0.685	0.432	0.250	0.031	0.177	-		
	180612PDSR-MM			●	●	●	●				●	●				0.685	0.432	0.250	0.047	0.177	-		
	180616PDSR-MM				●		●				●	●				0.685	0.432	0.250	0.063	0.177	-		
	180620PDSR-MM															0.685	0.432	0.250	0.079	0.177	-		
	180624PDSR-MM				●	●					●	●				0.685	0.432	0.250	0.094	0.177	-		
	180630R-MM						●				●	●				0.657	0.432	0.250	0.118	0.177	-		
	180632R-MM				●	●	●				●	●				0.657	0.432	0.250	0.126	0.177	-		
	180640R-MM						●				●	●				0.657	0.432	0.250	0.157	0.177	-		
	180648R-MM						●				●	●				0.657	0.432	0.250	0.189	0.177	-		
	180650R-MM						●				●	●				0.657	0.432	0.250	0.197	0.177	-		
	180660R-MM															0.657	0.432	0.250	0.236	0.177	-		
	180664R-MM						●				●	●				0.657	0.432	0.250	0.252	0.177	-		
BAMPR-XAF New 	BAMPR-XAF															1.004	0.413	0.276	-	-	-		E106~E108
BAMPR-XAW New 	BAMPR-XAW															1.004	0.394	0.276	-	-	-		E106~E108
BAMPR-XAWR New 	BAMPR-XAWR															1.004	0.394	0.276	-	-	-		E107 E108
CDEW-NAF  strengthened Edge	1204R-NAF															1/2	3/8	0.187	-	0.173	-		E105
	1204L-NAF															1/2	3/8	0.187	-	0.173	-		
CDEW-NAW  strengthened Edge Wiper Insert	1204R-NAW															1/2	3/8	0.187	-	0.173	-		E105
	1204L-NAW															1/2	3/8	0.187	-	0.173	-		

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

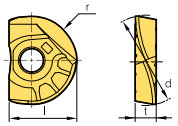
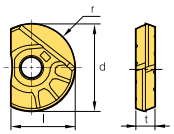
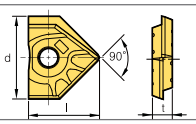
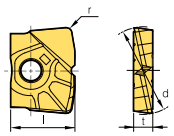
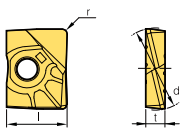
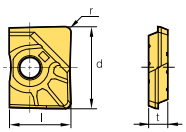
Inserts	Designation	Cermet		Coated								Uncoated		PCD	Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC3500	PC3600	PC9530	PC6510	PC5300	G10	H01	DP200	l	d	t	r	d_1	C	
CDEW-XAW Sharp Edge Wiper Insert	1204R-XAW															1/2	3/8	0.187	-	0.173	-	E105
	1204L-XAW															1/2	3/8	0.187	-	0.173	-	
CDEW-XAF Sharp Edge	1204R-XAF															1/2	3/8	0.187	-	0.173	-	E105
	1204L-XAF															1/2	3/8	0.187	-	0.173	-	
CDEW-XCF Sharp Edge	1204R-XCF												●			1/2	3/8	0.187	-	0.173	-	E105
	1204L-XCF															1/2	3/8	0.187	-	0.173	-	
CNHQ	1005-C0.5															25/64	25/64	7/32	-	0.185	0.020	E256 E257
	1305-C0.5															1/2	25/64	7/32	-	0.185	0.020	
	1606-C0.5															5/8	15/32	1/4	-	0.232	0.020	
CPMH	432-MM							●								0.508	1/2	0.187	1/32	0.217	-	E233
CPMT	21.51-MM							●								0.254	1/4	0.094	1/64	0.108	-	E233
	2.522-MM							●								0.317	5/16	0.134	1/32	0.125	-	
	32.52-MM							●								0.381	3/8	0.156	1/32	0.173	-	
HECN	532FN															23/64	5/8	3/16	1/32	-	-	E282
	532SN															23/64	5/8	3/16	1/32	-	-	
	532TN															23/64	5/8	3/16	1/32	-	-	
	633FN															7/16	3/4	3/16	3/64	-	-	
	633TN															7/16	3/4	3/16	3/64	-	-	
HPEN	532FN															23/64	5/8	3/16	1/32	-	-	E283
	532SN															23/64	5/8	3/16	1/32	-	-	
	532EN															23/64	5/8	3/16	1/32	-	-	
	633FN															7/16	3/4	3/16	3/64	-	-	
HPEN-WC	532-WC															23/64	5/8	3/16	1/32	-	-	E283
	633-WC															7/16	3/4	3/16	3/64	-	-	
LBH	0312															9/32	5/16	3/32	5/32	-	-	E220~E222
	0375															21/64	3/8	7/64	3/16	-	-	
	0500															13/32	1/2	1/8	1/4	-	-	
	0625															15/32	5/8	5/32	5/16	-	-	
	0750															37/64	3/4	13/64	3/8	-	-	
	1000															47/64	1	15/64	1/2	-	-	
	1250															59/64	1 1/4	9/32	5/8	-	-	
LBH-KF	0312-KF															9/32	5/16	3/32	5/32			E219 E220
	0375-KF															21/64	3/8	7/64	3/16			
	0500-KF															13/32	1/2	1/8	1/4			
	0625-KF															15/32	5/8	5/32	5/16			
	0750-KF															37/64	3/4	13/64	3/8			
	1000-KF															47/64	1	15/64	1/2			
	1250-KF															59/64	1 1/4	9/32	5/8			

● : Stock item

Workpiece			Cermet		Coated										Uncoated		
			CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC3500	PC3600	PC9530	PC6510	PC5300		ST30A	G10	H01
Steel	P		●	◗	●	◗	✱	✱	◗	◗			✱	◗			
Stainless steel	M				●	◗	◗				✱		✱				
Cast iron	K				●	◗	✱	✱				●	✱		◗	◗	●
Non-ferrous metal	N					●	●										◗
Heat resistant alloy, Titanium alloy	S					●	●						✱				
Hardened steel	H				●	◗	✱	✱					◗				

Machining types

● Continuous cutting
◗ General cutting
✱ Interrupted cutting

Inserts	Designation	Dimensions (inch) l	d	t	r	d_1	Geometries	Available tools
LBH-KH (New) 	0312-KH	9/32	5/16	3/32	5/32			E219 E220
	0375-KH	21/64	3/8	7/64	3/16			
	0500-KH	13/32	1/2	1/8	1/4			
	0625-KH	15/32	5/8	5/32	5/16			
	0750-KH	37/64	3/4	13/64	3/8			
	1000-KH	47/64	1	15/64	1/2			
	1250-KH	59/64	1 1/4	9/32	5/8			
LBS 	0312	9/32	5/16	3/32	5/32	-		E220~E222
	0375	21/64	3/8	7/64	3/16	-		
	0500	13/32	1/2	1/8	1/4	-		
	0625	15/32	5/8	5/32	5/16	-		
	0750	37/64	3/4	13/64	3/8	-		
	1000	47/64	1	15/64	1/2	-		
	1250	59/64	1 1/4	9/32	5/8	-		
LCF 	0625-D90	35/64	5/8	5/32	-	-		E220~E222
	0750-D90	43/64	3/4	13/64	-	-		
	1000-D90	27/32	1	15/64	-	-		
LFH 	0375	21/64	3/8	7/64	3/64	-		E220~E222
	0500	13/32	1/2	1/8	3/64	-		
	0625	15/32	5/8	5/32	1/16	-		
	0750	37/64	3/4	13/64	1/16	-		
	1000	47/64	1	15/64	5/64	-		
	1250	59/64	1 1/4	9/32	5/64	-		
LRH 	0375-R015	21/64	3/8	7/64	1/64	-	 LRH Type	E220~E222
	0375-R031	21/64	3/8	7/64	1/32	-		
	0375-R062	21/64	3/8	7/64	1/16	-		
	0500-R015	13/32	1/2	1/8	1/64	-		
	0500-R031	13/32	1/2	1/8	1/32	-		
	0500-R062	13/32	1/2	1/8	1/16	-		
	0625-R015	15/32	5/8	5/32	1/64	-		
	0625-R031	15/32	5/8	5/32	1/32	-		
	0625-R062	15/32	5/8	5/32	1/16	-		
	0625-R125	15/32	5/8	5/32	1/8	-		
	0750-R015	37/64	3/4	1/4	1/64	-		
	0750-R031	37/64	3/4	1/4	1/32	-		
	0750-R062	37/64	3/4	1/4	1/16	-		
	0750-R125	37/64	3/4	1/4	1/8	-		
	1000-R015	47/64	1	15/64	1/64	-		
	1000-R031	47/64	1	15/64	1/32	-		
	1000-R062	47/64	1	15/64	1/16	-		
LR  Special type	1000-R125	47/64	1	15/64	1/8	-	 LR Type	
	1250-R031	59/64	1 1/4	9/32	1/32	-		
	1250-R062	59/64	1 1/4	9/32	1/16	-		
	1250-R125	59/64	1 1/4	9/32	1/8	-		

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	●	●	✱	●	●	✱			✱	✱	●		
	Stainless steel	M			●	✱			✱	✱		✱	✱			
	Cast iron	K									●	✱	✱		●	●
	Non-ferrous metal	N														●
	Heat resistant alloy, Titanium alloy	S							✱			✱	✱			
	Hardened steel	H										●	✱			

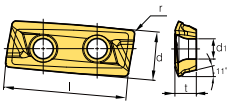
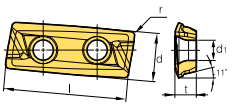
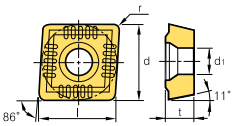
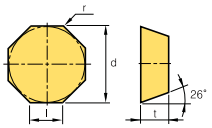
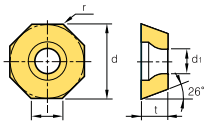
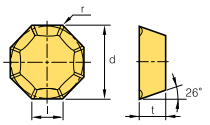
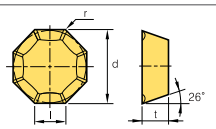
Machining types

● Continuous cutting
● General cutting
✱ Interrupted cutting

Inserts	Designation		Cermet		Coated									Uncoated			Dimensions (inch)					Geometries	Available tools
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
LNCS	1907-C1.5-WC																3/4	0.563	0.276	-	0.228		E287 E288
LNCS	1907-R3.0-WC																3/4	0.563	0.276	-	0.228		E287 E288
LNE	324-R0.8																5/8	3/8	1/4	1/32	0.173		E271
	324-C1.0																5/8	3/8	1/4	3/64	0.173		
KEL-MF	150608-MF																5/8	0.402	1/4	0.031	-		E271
	150608-ML																5/8	0.402	1/4	0.031	-		
KEL-QNN	1506QNN-MF																5/8	0.402	1/4	0.031	-		E271
	1506QNN-ML																5/8	0.402	1/4	0.031	-		
KEL-ANN	1506ANN-MF																5/8	0.402	1/4	0.031	-		E271
	1506ANN-ML																5/8	0.402	1/4	0.031	-		
LNM(E)X-MF	LNMX	100605PNR-MF					●	●			●	●	●				25/64	33/128	33/128	3/128	0.318		E70 E71 E74 E75 E78~E82
		100608PNR-MF						●			●	●	●				25/64	33/128	33/128	1/32	0.318		
	LNEX	100605PNR-MF					●				●	●	●				25/64	33/128	33/128	3/128	0.318		
		100608PNR-MF					●				●	●					25/64	33/128	33/128	1/32	0.318		
LNM(E)X-MF	LNMX	151004PNR-MF					●	●			●	●	●				19/32	25/64	25/64	1/64	0.177		E70 E71 E74 E75 E78~E82
		151008PNR-MF					●	●			●	●	●				19/32	25/64	25/64	1/32	0.177		
		151016PNR-MF						●			●	●	●				19/32	25/64	25/64	1/16	0.177		
	LNEX	151004PNR-MF					●				●	●	●				19/32	25/64	25/64	1/64	0.177		
		151008PNR-MF									●	●	●				19/32	25/64	25/64	1/32	0.177		
		151016PNR-MF					●				●		●				19/32	25/64	25/64	1/16	0.177		
LNM(E)X-MM	LNMX	100605PNR-MM					●	●	●	●	●	●	●				25/64	33/128	33/128	3/128	0.318		E70~E84
		100608PNR-MM					●	●				●	●				25/64	33/128	33/128	1/32	0.318		
		100605PNL-MM					●	●			●	●	●				25/64	33/128	33/128	3/128	0.318		
	LNEX	100605PNR-MM					●				●	●	●				25/64	33/128	33/128	3/128	0.318		
		100608PNR-MM					●				●						25/64	33/128	33/128	1/32	0.318		
		100605PNL-MM									●	●					25/64	33/128	33/128	3/128	0.318		
LNM(E)X-MM	LNMX	151004PNR-MM						●			●		●				19/32	25/64	25/64	1/64	0.177		E70~E84
		151008PNR-MM					●	●	●	●	●	●	●				19/32	25/64	25/64	1/32	0.177		
		151016PNR-MM					●				●		●				19/32	25/64	25/64	1/16	0.177		
		151008PNL-MM						●				●	●				19/32	25/64	25/64	1/32	0.177		
	LNEX	151004PNR-MM									●		●				19/32	25/64	25/64	1/64	0.177		
		151008PNR-MM					●				●	●	●				19/32	25/64	25/64	1/32	0.177		
		151016PNR-MM									●	●	●				19/32	25/64	25/64	1/16	0.177		
		151008PNL-MM					●				●	●					19/32	25/64	25/64	1/32	0.177		
LNEX-MA	LNEX	100605PNR-MA														●	25/64	33/128	33/128	3/128	0.318		E70~E75 E78~E82
		151004PNR-MA														●	19/32	25/64	25/64	1/64	0.177		
		151008PNR-MA														●	19/32	26/64	26/64	1/32	0.177		

● : Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◖ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

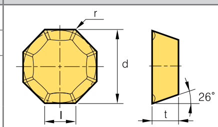
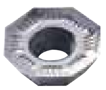
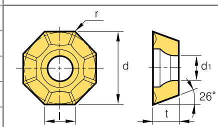
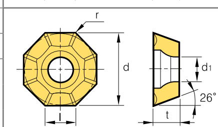
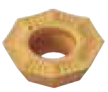
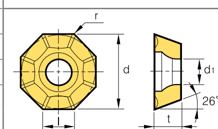
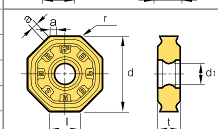
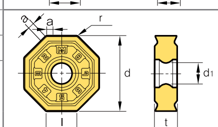
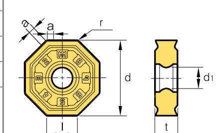
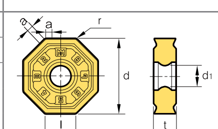
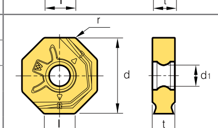
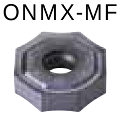
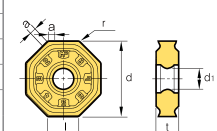
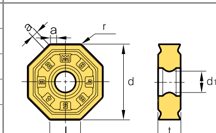
Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d1	
LXET-MA (New) 	250404PEFR-125-MA															0.984	0.424	0.187	1/64	0.177		E249~E251
	2504PEFR-125-MA															0.984	0.424	0.187	2/64	0.177	
	250412PEFR-125-MA															0.984	0.424	0.187	3/64	0.177	
	250416PEFR-125-MA															0.984	0.424	0.187	4/64	0.177	
	250404PEFR-150-MA															0.984	0.418	0.187	1/64	0.177	
	2504PEFR-150-MA															0.984	0.418	0.187	2/64	0.177	
	250412PEFR-150-MA															0.984	0.418	0.187	3/64	0.177	
	250416PEFR-150-MA															0.984	0.418	0.187	4/64	0.177	
	340504PEFR-200-MA															1.339	0.542	0.219	1/64	0.219	
	3405PEFR-200-MA															1.339	0.542	0.219	2/64	0.219	
	340512PEFR-200-MA															1.339	0.542	0.219	3/64	0.219	
	340516PEFR-200-MA															1.339	0.542	0.219	4/64	0.219	
	340504PEFR-250-MA															1.339	0.543	0.219	1/64	0.219	
	3405PEFR-250-MA															1.339	0.543	0.219	2/64	0.219	
	340512PEFR-250-MA															1.339	0.543	0.219	3/64	0.219	
	340516PEFR-250-MA															1.339	0.543	0.219	4/64	0.219	
LXET-ML (New) 	250404PEER-125-ML															0.984	0.424	0.187	1/64	0.177		E249~E251
	2504PEER-125-ML															0.984	0.424	0.187	2/64	0.177	
	250412PEER-125-ML															0.984	0.424	0.187	3/64	0.177	
	250416PEER-125-ML															0.984	0.424	0.187	4/64	0.177	
	250404PEER-150-ML															0.984	0.418	0.187	1/64	0.177	
	2504PEER-150-ML															0.984	0.418	0.187	2/64	0.177	
	250412PEER-150-ML															0.984	0.418	0.187	3/64	0.177	
	250416PEER-150-ML															0.984	0.418	0.187	4/64	0.177	
	340504PEER-200-ML															1.339	0.542	0.219	1/64	0.219	
	3405PEER-200-ML															1.339	0.542	0.219	2/64	0.219	
	340512PEER-200-ML															1.339	0.542	0.219	3/64	0.219	
	340516PEER-200-ML															1.339	0.542	0.219	4/64	0.219	
	340504PEER-250-ML															1.339	0.543	0.219	1/64	0.219	
	340508PEER-250-ML															1.339	0.543	0.219	2/64	0.219	
	340512PEER-250-ML															1.339	0.543	0.219	3/64	0.219	
	340516PEER-250-ML															1.339	0.543	0.219	4/64	0.219	
MPMT 	322															5/16	0.313	0.125	1/32	0.138		-
	432					●										19/64	3/8	0.156	1/32	0.177	
OFCN 	0704SN					●				●						19/64	45/64	0.187	3/128	-		E48
	0704FN															19/64	45/64	0.187	3/128	-	
	070408SN															19/64	45/64	0.187	1/32	-	
	070408FN															19/64	45/64	0.187	1/32	-	
	070408TN															19/64	45/64	0.187	1/32	-	
OFCW 	05T3SN															13/64	1/2	0.156	3/128	0.173		E48
	05T3FN															13/64	1/2	0.156	3/128	0.173	
	05T308FN															13/64	1/2	0.156	1/32	0.173	
OFKR-MA 	0704FN-MA														●	19/64	45/64	3/16	3/128	-		E48
	0704EN-MA															19/64	45/64	3/16	3/128	-	
OFKR-MF 	0704SN-MF			●	●											19/64	45/64	3/16	3/128	-		E48
	070408SN-MF			●												19/64	45/64	3/16	1/32	-	

● : Stock item

Workpiece		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
Steel	P	●	◐	●	◐	✚	✚	◐	◐			✚	◐		
Stainless steel	M				●	◐	◐			✚		✚			
Cast iron	K			●	◐	✚	✚				●	✚		◐	●
Non-ferrous metal	N					●	●								◐
Heat resistant alloy, Titanium alloy	S					●	●					✚			
Hardened steel	H			●	◐	✚	✚					◐			

Machining types

- ● Continuous cutting
- ◐ General cutting
- ✚ Interrupted cutting

Inserts	Designation	Cermet CN2000	Cermet CN30	Coated NCM325	Coated NCM335	Coated PC3500	Coated PC3600	Coated PC3545	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated ST30A	Uncoated G10	Uncoated H01	Dimensions (inch) l	d	t	r	d1	a	W	g	Geometries	Available tools
OFKR-MM 	0704SN-MM			●	●	●		●	●	●						19/64	45/64	3/16	3/128	-	-	-	-		E48
	070408SN-MM			●												19/64	45/64	3/16	1/32	-	-	-	-		
OFKT-MA 	05T3FN-MA														●	13/64	1/2	5/32	3/128	0.173	-	-	-		E47
	05T3EN-MA															13/64	1/2	5/32	3/128	0.173	-	-	-		E48
	0704FN-MA														●	19/64	45/64	3/16	3/128	0.217	-	-	-		
	0704EN-MA															19/64	45/64	3/16	3/128	0.217	-	-	-		
OFKT-MF 	05T3SN-MF			●	●					●						13/64	1/2	5/32	3/128	0.173	-	-	-		E47
	05T308SN-MF															13/64	1/2	5/32	1/32	0.217	-	-	-		
OFKT-MM 	05T3SN-MM			●	●	●			●							13/64	1/2	5/32	3/128	0.173	-	-	-		E47
	05T308SN-MM															13/64	1/2	5/32	1/32	0.173	-	-	-		E48
	0704SN-MM			●												19/64	45/64	3/16	3/128	0.217	-	-	-		
ONHX-MF 	060608-MF					●				●	●	●				17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-MF									●	●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E101
	0606ANN-MF									●	●	●				17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MF									●	●	●				21/64	51/64	15/64	1/32	0.220	0.060	-	-		
New ONHX-ML 	060608-ML										●	●				17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-ML										●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E101
ONHX-MM 	060608-MM					●				●	●	●				17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-MM					●				●	●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E101
	0606ANN-MM									●	●	●				17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MM									●	●	●				21/64	51/64	15/64	1/32	0.220	0.060	-	-		
ONHX-MA 	060608-MA														●	17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-MA														●	21/64	51/64	15/64	1/32	0.220	-	-	-		E101
ONHX-W 	060608-W					●			●	●	●					17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-W					●				●	●					21/64	51/64	15/64	1/32	0.220	-	-	-		E101
ONMX-MF 	060608-MF					●	●			●	●	●				17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-MF						●			●	●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E101
	0606ANN-MF						●		●	●	●	●				17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MF					●	●			●	●	●				21/64	51/64	15/64	1/32	0.220	0.060	-	-		
ONMX-MM 	060608-MM					●	●			●	●	●				17/64	5/8	15/64	1/32	0.220	-	-	-		E100
	080608-MM					●	●		●	●	●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E101
	0606ANN-MM					●	●			●	●	●				17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MM					●	●		●	●	●	●				21/64	51/64	15/64	1/32	0.220	0.060	-	-		

●: Stock item

Workpiece			P	M	K	N	S	H
	Steel	P	●					
	Stainless steel	M						
	Cast iron	K						
	Non-ferrous metal	N						
	Heat resistant alloy, Titanium alloy	S						
	Hardened steel	H						

Machining types

● Continuous cutting
General cutting
Interrupted cutting

Inserts	Designation	Cermet		Coated							Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC210F	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	Cutter width	
PNEJ	1223N					●										-	1/2	0.091	-	0.197	-	5/32	E262 E263
	1225N															-	1/2	0.098	-	0.197	-	23/128	
	1230N															-	1/2	0.118	-	0.197	-	13/64	
	1235N					●					●					-	1/2	0.138	-	0.197	-	15/64	
	1240N					●					●					-	1/2	0.157	-	0.197	-	9/32	
	1245N					●					●					-	1/2	0.177	-	0.197	-	5/16	
	1250N															-	1/2	0.197	-	0.197	-	23/64	
	1255N					●										-	1/2	0.217	-	0.197	-	25/64	
	1260N															-	1/2	0.236	-	0.197	-	7/16	
	1265N					●					●					-	1/2	0.256	-	0.197	-	15/32	
	1270N															-	1/2	0.276	-	0.197	-	33/64	
	1275N										●					-	1/2	0.295	-	0.197	-	35/64	
	1285N															-	1/2	0.335	-	0.197	-	19/32	
PNEJ-C	1223N-C03															-	1/2	0.091	-	0.197	-	5/32	E262 E263
	1230N-C03															-	1/2	0.118	-	0.197	-	13/64	
	1235N-C03															-	1/2	0.138	-	0.197	-	15/64	
	1240N-C05															-	1/2	0.157	-	0.197	-	9/32	
	1245N-C05															-	1/2	0.177	-	0.197	-	5/16	
	1250N-C05															-	1/2	0.197	-	0.197	-	23/64	
	1255N-C05															-	1/2	0.217	-	0.197	-	25/64	
	1260N-C05															-	1/2	0.236	-	0.197	-	7/16	
	1265N-C05															-	1/2	0.256	-	0.197	-	15/32	
	1270N-C05															-	1/2	0.276	-	0.197	-	33/64	
	1275N-C05															-	1/2	0.295	-	0.197	-	35/64	
RC	062															0.620	5/8	0.138	5/16	-	-	-	E224
	075															0.682	3/4	0.157	3/8	-	-	-	
	100															0.874	1	0.197	1/2	-	-	-	
	125															1.090	1 1/4	0.236	5/8	-	-	-	
RDCT-MA	10T3M0-MA													●		-	25/64	0.156	-	0.157	-	-	E170 E171 E176 E177 E181
	1204M0-MA													●		-	15/32	0.187	-	0.177	-	-	
RDHW	0501M0F															-	13/64	0.063	-	0.091	-	-	E174 E175 E180
	0501M0E								●							-	13/64	0.063	-	0.091	-	-	
	0501M0S															-	13/64	0.063	-	0.091	-	-	
	06T1M0F															-	15/64	0.078	-	0.098	-	-	
	06T1M0E								●							-	15/64	0.078	-	0.098	-	-	
	06T1M0S															-	15/64	0.078	-	0.098	-	-	
	0702M0F															-	9/32	0.094	-	0.110	-	-	
	0702M0E								●							-	9/32	0.094	-	0.110	-	-	
	0702M0S															-	9/32	0.094	-	0.110	-	-	
	0803M0F															-	5/16	0.125	-	0.134	-	-	
	0803M0E								●							-	5/16	0.125	-	0.134	-	-	
	0803M0S															-	5/16	0.125	-	0.134	-	-	
RDHW	1605M0F															-	5/8	0.219	-	0.217	-	-	E172 E173 E178 E179 E181
	1605M0E															-	5/8	0.219	-	0.217	-	-	
	1605M0S															-	5/8	0.219	-	0.217	-	-	
	2006M0F															-	25/32	1/4	-	0.217	-	-	
	2006M0E															-	25/32	1/4	-	0.217	-	-	
	2006M0S															-	25/32	1/4	-	0.217	-	-	
RDKT-MF	10T3M0-MF								●		●					-	25/64	0.156	-	0.152	-	-	E170 E171 E176 E177 E181
	1204M0-MF					●			●		●					-	15/32	0.187	-	0.177	-	-	
	1605M0-MF															-	5/8	0.219	-	0.217	-	-	
RDKT-ML	1605M0-ML															-	5/8	0.219	-	0.217	-	-	E172 E178 E181

※ C03 : Chamfer 0.012inch
C05 : Chamfer 0.020inch

● : Stock item

Workpiece			Cermet		Coated									Uncoated		
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01
Steel	P		●	✱	✱	✱	✱	✱	✱			✱	✱	✱	✱		
Stainless steel	M				✱	✱			✱	✱		✱	✱				
Cast iron	K										●	✱	✱		✱	●	
Non-ferrous metal	N															✱	●
Heat resistant alloy, Titanium alloy	S								✱			✱	✱				
Hardened steel	H											✱	✱				

Machining types

● Continuous cutting
✱ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimension (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	l	d	t	r	d_1	a		
RDKT-MM	10T3M0-MM			●	●	●		●	●	●	●						-	25/64	0.156	-	0.152	-		E170~E173
	1204M0-MM			●	●	●		●	●	●	●						-	15/32	0.187	-	0.177	-		E176~E181
	1605M0-MM					●		●									-	5/8	0.219	-	0.217	-		
	2006M0-MM					●		●									-	25/32	0.250	-	0.217	-		
RDKW	0501M0E					●											-	13/64	1/16	-	0.091	-		E174
	06T1M0E					●											-	15/64	0.078	-	0.098	-		E175
	0702M0E					●											-	9/32	3/32	-	0.110	-		E180
	0803M0E					●											-	5/16	1/8	-	0.134	-		
REKR-MM	170400-MM																-	45/64	3/16	-	-	-		E48
RPCT-MA (New)	10T3M0-MA															●	-	0.394	0.156	-	0.157	-		E182~E190
	1204M0-MA															●	-	0.472	0.187	-	0.177	-		
	1606M0-MA															●	-	0.630	0.250	-	0.217	-		
	2007M0-MA															●	-	0.787	0.276	-	0.276	-		
RPET-ML (New)	0803M0E-ML																-	0.315	0.125	-	0.134	-		E182~E190
	10T3M0E																-	0.394	0.156	-	0.157	-		
	1204M0E-ML										●	●					-	0.472	0.187	-	0.177	-		
	1606M0E-ML																-	0.630	0.250	-	0.217	-		
	2007M0E-ML (New)										●	●					-	0.787	0.276	-	0.276	-		
RPMT-MF	0803M0E-MF						●				●	●					-	0.315	0.125	-	0.134	-		E182~E190
	10T3M0E-MF						●				●	●					-	0.394	0.156	-	0.157	-		
	1204M0E-MF						●				●	●					-	0.472	0.187	-	0.177	-		
	1606M0E-MF						●				●	●					-	0.630	0.250	-	0.217	-		
	2007M0E-MF (New)						●				●	●					-	0.787	0.276	-	0.276	-		
RPMT-MM	0803M0S-MM						●				●	●					-	0.315	0.125	-	0.134	-		E182~E190
	10T3M0S-MM						●				●	●					-	0.394	0.156	-	0.157	-		
	1204M0S-MM						●				●	●					-	0.472	0.187	-	0.177	-		
	1606M0S-MM						●				●	●					-	0.630	0.250	-	0.217	-		
	2007M0S-MM						●				●	●					-	0.787	0.276	-	0.276	-		
RPMW (New)	0803M0E1						●				●	●					-	0.315	0.125	-	0.134	-		E182~E190
	10T3M0E1						●				●	●					-	0.394	0.156	-	0.157	-		
	1204M0S1						●				●	●					-	0.472	0.187	-	0.177	-		
	1204M0S2										●	●					-	0.472	0.187	-	0.177	-		
	1606M0S1						●				●	●					-	0.630	0.250	-	0.217	-		
	2007M0S1						●				●	●					-	0.787	0.276	-	0.276	-		
	42R																-	1/2	1/8	-	-	0.138		E280~E281
	42L																-	1/2	1/8	-	-	0.138		
	53R																-	5/8	3/16	-	-	0.059		
	53L																-	5/8	3/16	-	-	0.059		
SDCN	42M														●		-	1/2	1/8	-	-	0.059		E34
	42M-G															●	-	1/2	1/8	-	-	0.059		E35
	42MT	●	●		●									●			-	1/2	1/8	-	-	0.059		E44
	42MT-RH																-	1/2	1/8	-	-	0.059		E45
	42MT-S20								●								-	1/2	1/8	-	-	0.059		E280
	53M														●		-	5/8	3/16	-	-	0.059		E281
	53M-G															●	-	5/8	3/16	-	-	0.059		
	53MT		●	●		●								●			-	5/8	3/16	-	-	0.059		
	53MT-RH					●											-	5/8	3/16	-	-	0.059		
	53MT-S20								●								-	5/8	3/16	-	-	0.059		
	42AEEN																-	1/2	1/8	-	-	0.059		
	42AEEN-RH																-	1/2	1/8	-	-	0.056		
	42AESN																-	1/2	1/8	-	-	0.059		
	42AESN-RH																-	1/2	1/8	-	-	0.056		
	53AEEN																-	5/8	3/16	-	-	0.059		
	53AEEN-RH																-	5/8	3/16	-	-	0.056		
	53AESN																-	5/8	3/16	-	-	0.059		
	53AESN-RH																-	5/8	3/16	-	-	0.056		

▶Cutting edge geometry
· G : Light Side, Sharpe Edge
· S20 : STS
· RH : Strengthened Edge

▶Sub-cutting edge geometry
· M : AEFN
· MT : AETN

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	H01
	Steel	P	●	◖	◖	✱	◖	◖	✱			✱	✱		◖	
	Stainless steel	M			◖	✱			✱	✱		✱	✱			
	Cast iron	K									●	✱	✱			●
	Non-ferrous metal	N												●		◖
	Heat resistant alloy, Titanium alloy	S							✱			✱	✱			
	Hardened steel	H										◖	✱			

Machining types

● Continuous cutting
◖ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	H01	l	d	t	r	d_1	a	b		
SDET-MA	09M402R-MA												●		●	-	3/8	0.143	1/128	0.157	0.047	-		E164~E169
	09M404R-MA															-	3/8	0.143	1/64	0.157	0.047	-		
	09M405R-MA															-	3/8	0.143	3/128	0.157	0.047	-		
	130504R-MA														●	-	0.531	0.219	1/64	0.219	0.087	-		
SDET-MF	09M405R-MF															-	3/8	5/32	3/124	0.157	0.047	-		E164~E169
	130508R-MF															-	0.531	7/32	1/32	0.219	0.087	-		
SDET-MM	09M405R-MM															-	3/8	5/32	3/124	0.157	0.047	-		E164~E169
	130508R-MM															-	0.531	7/32	1/32	0.219	0.087	-		
SDKN-CM	42MT-CM		●													-	1/2	1/8	-	-	0.059	-		E34 E44
SDKN-MU	42AESN-MU						●									-	1/2	1/8	-	-	0.086	-		E34 E35 E44 E45
	53AESN-MU						●									-	5/8	3/16	-	-	0.083	-		
SDKN-SU	42AESN-SU						●				●	●				-	1/2	1/8	-	-	0.086	-		E34 E35 E44 E45
	53AESN-SU						●				●	●				-	5/8	3/16	-	-	0.083	-		
SDKR-MX	42AESN-MX															-	1/2	1/8	-	-	0.057	-		E34 E35 E44 E45
	42AETN-MX															-	1/2	1/8	-	-	0.057	-		
	42AEN-MX			●												-	1/2	1/8	-	-	0.057	-		
	53AESN-MX				●											-	5/8	3/16	-	-	0.057	-		
	53AETN-MX															-	5/8	3/16	-	-	0.057	-		
	53AEN-MX			●												-	5/8	3/16	-	-	0.057	-		
SDMT-MM	322-MM					●					●					-	9.3/8	1/8	0.031	0.173	-	-		E197 E211
SDXT-MA	09M405R-MA														●	-	3/8	0.157	3/128	0.157	0.047	-		E164~E169
	130508R-MA														●	-	0.531	7/32	1/32	0.219	0.087	-		
SDXT-MF	09M403R-MF															-	3/8	0.157	1/64	0.157	0.047	-		E164~E169
	09M403L-MF															-	3/8	0.157	1/64	0.157	0.047	-		
	09M404R-MF															-	3/8	0.157	1/64	0.157	0.047	-		
	09M404L-MF															-	3/8	0.157	1/64	0.157	0.047	-		
	09M405R-MF			●	●		●		●	●	●	●				-	3/8	0.157	3/128	0.157	0.047	-		
	09M405L-MF															-	3/8	0.157	3/128	0.157	0.047	-		
	130508R-MF			●	●		●		●	●	●	●				-	0.531	7/32	1/32	0.219	0.087	-		
SDXT-MM	09M405R-MM			●	●	●	●		●	●	●	●				-	3/8	0.157	3/128	0.157	0.047	-		E164~E169
	09M405L-MM						●			●						-	3/8	0.157	3/128	0.157	0.047	-		
	130508R-MM			●	●	●	●	●	●	●	●	●				-	0.531	7/32	1/32	0.219	0.087	-		
	130508L-MM															-	0.531	7/32	1/32	0.219	0.087	-		
	130538-MM															-	0.531	7/32	5/32	0.219	0.087	-		

● : Stock item

Workpiece			Machianing types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	⬍ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated									Uncoated			Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	l	d	t	r	d_1	a		
SECA	43AFSN			●													-	1/2	3/16	-	0.219	0.105		-
	43AFTN		●			●			●								-	1/2	3/16	-	0.219	0.105		
	43AFFN																-	1/2	3/16	-	0.219	0.105		
	43AFEN																-	1/2	3/16	-	0.219	0.105		
	53AFSN																-	5/8	3/16	-	0.217	0.110		
	53AFTN																-	5/8	3/16	-	0.217	0.110		
	53AFFN																-	5/8	3/16	-	0.217	0.110		
SECN	42AFFN														●	●	-	1/2	0.125	-	-	0.091		E36 E37
	42AFTN	●	●											●			-	1/2	0.125	-	-	0.091		
	42AFEN																-	1/2	0.125	-	-	0.091		
	42AFSN			●	●												-	1/2	0.125	-	-	0.091		
	42AFEN-RH									●	●						-	1/2	0.125	-	-	0.091		
	42AFTN-RH					●											-	1/2	0.125	-	-	0.091		
	42AFTN-S20								●								-	1/2	0.125	-	-	0.091		
	53AFFN														●		-	5/8	0.187	-	-	0.094		
	53AFTN		●										●				-	5/8	0.187	-	-	0.094		
	53AFEN																-	5/8	0.187	-	-	0.094		
	53AFSN			●													-	5/8	0.187	-	-	0.094		
	53AFEN-RH																-	5/8	0.187	-	-	0.094		
	53AFSN-RH									●							-	5/8	0.187	-	-	0.094		
	53AFTN-S20																-	5/8	0.187	-	-	0.094		
SEET-MA	32AGFN-MA														●		-	3/8	0.125	-	0.134	0.083		E158~E163
	14M4AGFN-MA														●		-	0.551	0.157	-	0.173	0.096		
SEET-MF	32AGSN-MF			●					●	●	●	●					-	3/8	0.125	-	0.134	0.083		E158~E163
	14M4AGSN-MF			●	●				●	●	●	●					-	0.551	0.157	-	0.173	0.096		
SEET-MM	32AGSN-MM			●						●	●	●					-	3/8	0.125	-	0.134	0.083		E158~E163
	14M4AGSN-MM			●	●	●			●	●	●	●					-	0.551	0.157	-	0.173	0.096		
SEEW	32AGTN																-	3/8	0.125	-	0.134	0.083		E158~E163
	14M4AGTN		●														-	0.551	0.157	-	0.173	0.096		
SEEW-W	14M4AGFN-W																-	0.551	0.717	-	0.157	0.173		E158 E159 E161 E162 E163
	14M4AGSN-W										●						-	0.551	0.717	-	0.157	0.173		
	14M4AGTN-W						●			●							-	0.551	0.717	-	0.157	0.173		
SEKN-SU	42AFSN-SU						●	●									-	1/2	1/8	-	0.097	-		E36 E37
	53AFSN-SU						●	●									-	5/8	3/16	-	0.097	-		
SEKR-MF1	42AFSN-MF1																-	1/2	0.125	-	0.090	-		E36 E37

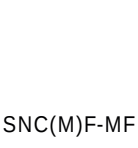
▶Shape of Edge
· S20 : STS
· RH : Strengthened Edge, STS

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	G10	H01
	Steel	P	●	◖◗	✱	✱	◖◗	◖◗	✱		✱	✱	✱	◖◗		
	Stainless steel	M			✱	✱			✱	✱	✱	✱	✱			
	Cast iron	K									●	✱	✱	◖◗	◖◗	●
	Non-ferrous metal	N														◖◗
	Heat resistant alloy, Titanium alloy	S							✱		✱	✱				
	Hardened steel	H									✱	✱				

Machining types

● Continuous cutting
◖◗ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (inch)						Dimensions	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	G10	H01	l	d	t	d_1	a	b		
SEKR-MX	42AFSN-MX		●	●	●				●							-	1/2	0.125	-	0.090	-		E36 E37
	43AFSN-MX			●												-	1/2	0.187	-	0.090	-		
	53AFSN-MX			●	●				●							-	5/8	0.187	-	0.094	-		
SEKR-X35	42AFSN-X35															-	1/2	1/8	-	0.097	-		E36
	42AFFN-X35															-	1/2	1/8	-	0.091	-		
	43AFFN-X35															-	1/2	3/16	-	0.091	-		
SEMN	43AZ															-	1/2	3/16	-	0.087	-		E36
SEXT-MF	32AGSN-MF						●			●	●	●				-	3/8	1/8	0.134	0.083	-		E158~E163
	14M4AGSN-MF			●		●	●			●	●	●				-	0.551	0.157	0.173	0.104	-		
SEXT-MM	32AGSN-MM					●	●			●	●	●				-	3/8	1/8	0.134	0.083	-		E158~E163
	14M4AGSN-MM			●	●	●	●		●	●	●	●				-	0.551	0.157	0.173	0.104	-		
SEXT-MR	32AGSN-MR															-	3/8	1/8	0.134	0.083	-		E158~E163
	14M4AGSN-MR			●		●			●		●					-	0.551	0.157	0.173	0.104	-		
SFCN	42EFR													●	●	-	1/2	1/8	-	0.098	-		E38
SNC(M)F-MF	SNCF 1206ANN-MF															-	1/2	17/64	-	0.079	-		E95 E96
	1507ANN-MF									●						-	5/8	0.289	-	0.083	-		
	SNMF 1206ANN-MF															-	1/2	17/64	-	0.079	-		
	1507ANN-MF															-	5/8	0.289	-	0.083	-		
	SNCF 1206ENN-MF									●						-	1/2	17/64	-	0.079	-		E97 E98
	1507ENN-MF					●				●						-	5/8	0.289	-	0.083	-		
	SNMF 1206ENN-MF					●										-	1/2	17/64	-	0.079	-		
	1507ENN-MF															-	5/8	0.289	-	0.083	-		

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	⬍ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)							Dimensions	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	b		
SNC(M)F-MF	SNCF 1206QNN-MF					●				●						-	1/2	33/128	0.039	-	0.039	-		E99
	SNMF 1206QNN-MF					●										-	1/2	33/128	0.039	-	0.039	-		
SNC(M)F-MM	SNCF 1206ANN-MM					●										-	1/2	33/128	-	-	0.07	-		E95
	1507ANN-MM					●										-	5/8	0.289	-	-	0.071	-		E96
	SNMF 1206ANN-MM															-	1/2	33/128	-	-	0.07	-		
	1507ANN-MM					●										-	5/8	0.289	-	-	0.071	-		
SNC(M)F-MM	SNCF 1206ENN-MM					●										-	1/2	33/128	-	-	0.07	-		E97
	1507ENN-MM															-	5/8	0.289	-	-	0.07	-		E98
	SNMF 1206ENN-MM					●										-	1/2	33/128	-	-	0.07	-		
	1507ENN-MM					●										-	5/8	0.289	-	-	0.07	-		
SNC(M)F-MM	SNCF 1206QNN-MM					●				●						-	1/2	33/128	0.031	-	0.039	-		E99
	SNMF 1206QNN-MM					●										-	1/2	33/128	0.031	-	0.039	-		
SNCN	43ENN			●									●			-	1/2	0.187	-	-	0.055	0.039		E39
	53ENN															-	5/8	0.187	-	-	0.055	0.039		E278 E279
SNEF	435									●						-	1/2	0.187	0.075	-	-	-		E284
	535															-	5/8	0.187	0.075	-	-	-		
SNEU-MF	120420-MF									●						-	1/2	3/16	5/69	0.224	(0.091)	-		E286
SNEU-MF	1204ANN-MF															-	1/2	3/16	-	0.224	(0.079)	-		E286
SNEU-TBW	1204-TBW															-	1/2	3/16	-	0.224	(0.083)	-		E286
SNEU-WMF	1204-WMF															-	1/2	3/16	-	0.224	-	-		E286
SNEX	101010									●						-	25/64	25/64	5/128	23/128	-	-		E253
	1010ZNN															-	25/64	25/64	(5/128)	23/128	-	-		

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	G10	H01	DP200
	Steel	P	●	●	●	●	●	●	●			●	●			
	Stainless steel	M			●	●			●	●		●	●			
	Cast iron	K									●	●	●	●	●	
	Non-ferrous metal	N												●	●	
	Heat resistant alloy, Titanium alloy	S							●			●	●			
	Hardened steel	H										●	●			

Machining types

● Continuous cutting
● General cutting
● Interrupted cutting

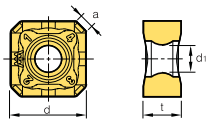
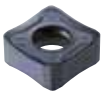
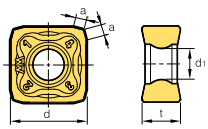
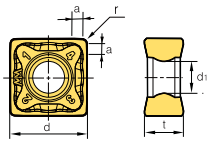
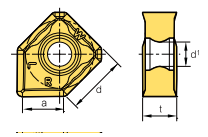
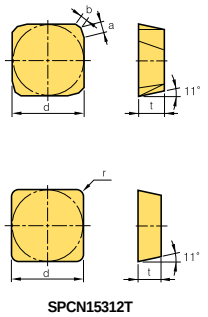
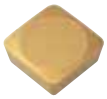
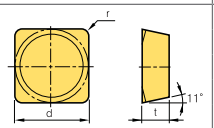
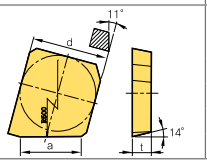
Inserts	Designation	Cermet		Coated										Uncoated		PCD	Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	G10	H01	DP200	l	d	t	r	d_1	a	b		
SNEX-CU1	101010-CU1									●						-	25/64	25/64	5/128	23/128	-	-		E304
	1010ZNN-CU1									●						-	25/64	25/64	5/128	23/128	-	-		
	121212-CU1															-	1/2	1/2	3/64	23/128	-	-		
	1212ZNN-CU1															-	1/2	1/2	3/64	23/128	-	-		
SNEX-MA	1206ANN-MA												●			-	1/2	1/4	-	0.177	0.093	-		E85~E94
	1206ENN-MA					●				●			●			-	1/2	1/4	-	0.205	0.072	-		
	1206QNN-MA												●			-	1/2	1/4	-	0.205	0.055	-		
	120612-MA												●			-	1/2	1/4	0.047	0.205	-	-		
SNEX-ML (New)	1206ANN-ML										●	●				-	1/2	1/4	-	0.205	0.093	-		E85~E94
	1206ENN-ML										●	●				-	1/2	1/4	-	0.205	0.717	-		
	1206QNN-ML										●	●				-	1/2	1/4	1/32	0.205	0.055	-		
	120612-ML										●	●				-	1/2	1/4	0.047	0.205	-	-		
	1507ANN-ML										●	●				-	5/8	1/4	-	0.220	0.124	-		
	1507ENN-ML										●	●				-	5/8	1/4	-	0.220	0.105	-		
SNEW	09T3ADFR													●		3/8	3/8	5/32	-	0.173	-	-		E109
SNEW-NAF XAW: Wiper Insert	09T3ADTR-NAF															3/8	3/8	5/32	-	0.173	-	-		E109
	09T3ADTR-NAW															3/8	3/8	5/32	-	0.173	-	-		
SNEW-XAF NAW: Wiper Insert	09T3ADTR-XAF															3/8	3/8	5/32	-	0.173	-	-		E109
	09T3ADTR-XAW															3/8	3/8	5/32	-	0.173	-	-		
SNHT-WX (New)	1102308R/L-WX										●					-	0.433	0.090	-	0.157	-	-		E267 E268
	110308R/L-WX										●					-	0.433	0.120	-	0.157	-	-		
	120308R/L-WX															-	1/2	0.130	-	0.197	-	-		
	1203508R/L-WX										●					-	1/2	0.140	-	0.197	-	-		
	120408R/L-WX															-	1/2	0.160	-	0.197	-	-		
	1204508R/L-WX										●					-	1/2	0.180	-	0.197	-	-		
	120508R/L-WX										●					-	1/2	0.196	-	0.197	-	-		
	1205408R/L-WX										●					-	1/2	0.215	-	0.197	-	-		
	120608R/L-WX															-	1/2	0.236	-	0.197	-	-		
	1206508R/L-WX															-	1/2	0.256	-	0.197	-	-		
	120708R/L-WX															-	1/2	0.276	-	0.197	-	-		
	1207508R/L-WX															-	1/2	0.295	-	0.197	-	-		
SNKN	1204ENN									●						-	1/2	3/16	-	-	0.055	0.039		E39
	1504ENN															-	5/8	3/16	-	-	0.055	0.039		E278 E279
SNM(E)X-MF	SNMX 1206ANN-MF					●	●			●	●	●				-	1/2	1/4	-	0.177	0.093	-		E85
	1507ANN-MF					●	●			●	●	●				-	5/8	5/16	-	0.220	0.124	-		E86
	SNEX 1206ANN-MF					●	●			●	●	●				-	1/2	1/4	-	0.177	0.093	-		E90
	1507ANN-MF					●				●	●	●				-	5/8	5/16	-	0.220	0.124	-		
SNM(E)X-MF	SNMX 1206ENN-MF					●				●	●	●				-	1/2	1/4	-	0.205	0.072	-		E85~E88
	1507ENN-MF					●	●			●	●	●				-	5/8	5/16	-	0.220	0.105	-		
	SNEX 1206ENN-MF									●	●	●				-	1/2	1/4	-	0.205	0.072	-		
	1507ENN-MF					●				●	●	●				-	5/8	5/16	-	0.220	0.105	-		
SNM(E)X-MF	SNMX 1206QNN-MF					●	●			●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		E93
	120612-MF						●			●	●	●				-	1/2	1/4	0.047	0.177	-	-		E94
	SNEX 1206QNN-MF					●				●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		
	120612-MF									●	●	●				-	1/2	1/4	0.047	0.177	-	-		

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01
	Steel	P	●	●	●	✱	●	●	●			✱	✱	✱	●		
	Stainless steel	M			●	✱				✱		✱	✱				
	Cast iron	K					●				●	✱	✱			●	●
	Non-ferrous metal	N															●
	Heat resistant alloy, Titanium	S										✱	✱				
	Hardened steel	H										●	✱				

Machining types

● Continuous cutting
● General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	l	d	t	r	d_1	a	b	
SNM(E)X-MM 	SNMX 1206ANN-MM			●		●	●	●	●	●	●	●					-	1/2	1/4	-	0.177	0.093	-		E85~E88
	1507ANN-MM						●	●		●	●	●					-	5/8	5/16	-	0.220	0.124	-		
	SNEX 1206ANN-MM			●			●	●	●	●	●	●					-	1/2	1/4	-	0.177	0.093	-		
	1507ANN-MM						●			●	●	●					-	5/8	5/16	-	0.220	0.124	-		
SNM(E)X-MM 	SNMX 1206ENN-MM						●	●		●	●	●					-	1/2	1/4	-	0.205	0.072	-		E89~E92
	1507ENN-MM						●	●		●	●	●					-	5/8	5/16	-	0.220	0.105	-		
	SNEX 1206ENN-MM						●	●		●	●	●					-	1/2	1/4	-	0.205	0.072	-		
	1507ENN-MM						●			●	●	●					-	5/8	5/16	-	0.220	0.105	-		
SNM(E)X-MM 	SNMX 1206QNN-MM						●	●		●	●	●					-	1/2	1/4	1/32	0.177	0.093	-		E93 E94
	120612-MM						●	●		●	●	●					-	1/2	1/4	0.047	0.177	-	-		
	SNEX 1206QNN-MM						●			●	●	●					-	1/2	1/4	1/32	0.177	0.093	-		
	120612-MM									●							-	1/2	1/4	0.047	0.177	-	-		
SNEX-W 	1206ANN-W						●			●	●						0.674	1/2	1/4	-	0.177	0.299	-		E85 E86
SPCN 	42EDR		●	●	●									●	●	●	-	1/2	1/8	-	-	0.055	0.039		E40 E41
	42EDR-RH									●	●						-	1/2	1/8	-	-	0.055	0.039		
	42EDL													●			-	1/2	1/8	-	-	0.055	0.039		
	42EDR-G															●	-	1/2	1/8	-	-	0.055	0.039		
	42EDR-RN																-	1/2	1/8			0.055	0.039		
	42EDER-RH																-	1/2	1/8	-	-	0.064	0.031		
	42EDSR-RH									●							-	1/2	1/8	-	-	0.064	0.031		
	42EDTR-RH							●									-	1/2	1/8	-	-	0.064	0.031		
	42EDR-S20								●								-	1/2	1/8	-	-	0.055	1.0		
	43EDR																-	1/2	3/16	-	-	0.055	1.0		
	5312T																-	5/8	3/16	0.047	-	-	-		
	53EDR		●	●										●	●		-	5/8	3/16	-	-	0.055	0.039		
	53EDR-RH																	5/8	3/16	-	-	0.055	0.039		
	53EDSR																-	5/8	3/16	-	-	0.055	0.039		
	53EDL									●							-	5/8	3/16	-	-	0.055	0.039		
	53EDR-G															●	-	5/8	3/16	-	-	0.055	0.039		
	53EDR-RN	●															-	5/8	3/16	-	-	0.055	0.039	SPCN15312T	
	53EDER-RH									●	●						-	5/8	3/16	-	-	0.064	0.031		
	53EDSR-RH									●							-	5/8	3/16	-	-	0.064	0.031		
	53EDTR-RH							●									-	5/8	3/16	-	-	0.064	0.031		
	53EDR-S20								●								-	5/8	3/16	-	-	0.055	0.039		
SPEN-WC 	434-WC																-	1/2	3/16	1/16	-	-	-		E285
	533-WC																-	5/8	3/16	3/64	-	-	-		
	534-WC																-	5/8	3/16	1/16	-	-	-		
	535-WC																-	5/8	3/16	5/64	-	-	-		
	636-WC																-	3/4	3/16	3/32	-	-	-		
SPEX 	42EDR-1																-	1/2	1/8	-	-	0.402	-		E40 E41
	42EDL-1																-	1/2	1/8	-	-	0.402	-		
	53EDR-1																-	5/8	3/16	-	-	0.402	-		
	53EDL-1																-	5/8	3/16	-	-	0.402	-		
	63EDR-1																-	3/4	3/16	-	-	0.402	-		
	63EDL-1																-	3/4	3/16	-	-	0.402	-		

● : Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬬ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

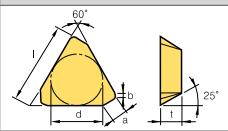
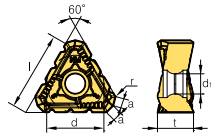
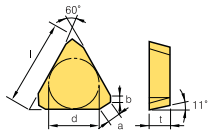
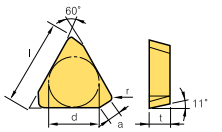
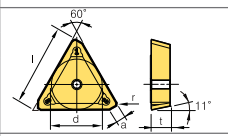
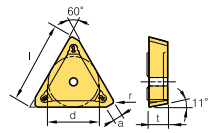
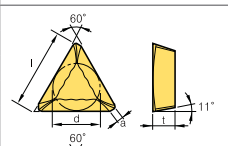
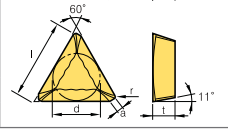
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	l	d	t	r	d_1	a	b		
SPFN	200-N																	0.346	0.087	-	1/128	-	-	-	±0.002 d r l	E264
	300-N																	0.386	0.118	-	1/128	-	-	-		
	400-N																	0.386	0.157	-	0.010	-	-	-		
SPKN-MU (New)	42EDSR-MU							●										-	1/2	1/8	-	-	0.034	0.074	b a d t 11°	E40 E41
	53EDSR-MU							●										-	5/8	3/4	-	-	0.033	0.076		
SPKN-SU	42EDSR-SU							●	●			●	●					1/2	1/2	1/8	-	-	0.065	0.036	b a d t 11°	E40 E41
	42EDSL-SU							●										1/2	1/2	1/8	-	-	0.065	0.036		
	53EDSR-SU							●	●			●	●					5/8	5/8	3/16	-	-	0.064	0.037		
	53EDSL-SU							●										5/8	5/8	3/16	-	-	0.064	0.037		
SPKR-MX	42EDSR-MX			●	●		●											-	1/2	1/8	-	-	0.055	-	a d t 11°	E40 E41
	42EDSL-MX			●														-	1/2	1/8	-	-	0.055	-		
	53EDR-MX			●														-	5/8	3/16	-	-	0.057	-		
	53EDSR-MX				●		●											-	5/8	3/16	-	-	0.057	-		
SPMN	422														●			-	1/2	0.125	1/32	-	-	-	r d t 11°	E230
SPMT	221			●														-	1/4	0.125	1/64	0.110	-	-	r d d_1 t 11°	E209 E226 E227
SPMT-KC	110408-KC						●								●	●		-	0.453	3/16	1/32	0.177	-	-	r d d_1 t 17°	E230
SPMT-MM	432-MM						●		●			●						-	1/2	0.187	1/32	0.220	-	-	r d d_1 t 11°	E209 E226 E227
	442-MMN																	-	1/2	7/32	1/32	0.220	-	-		
TECN	22R																	55/128	1/4	0.125	-	-	0.039	0.020	60° l d b a t 20° r	E46
	22TR		●												●			55/128	1/4	0.125	1/32	-	0.020	-		
	32R															●		0.650	3/8	0.125	-	-	0.039	0.020		
	32R-G																	0.650	3/8	0.125	-	-	0.039	0.020		
	32TR		●		●									●	●			0.650	3/8	0.125	1/32	-	0.020	-		
	32TR-S20									●								0.650	3/8	0.125	1/32	-	0.020	-		
	43R-G																	55/64	1/2	0.187	-	-	0.075	0.020		
	43TR-Z																	55/64	1/2	0.187	1/32	-	0.059	-		
	43TR																	55/64	1/2	0.187	1/32	-	0.059	-		
TEEN	32TR																	0.650	3/8	0.125	1/32	-	0.020	-	60° l d r a t 20° ▶hape of Edge · G : Light side, Sharp edge · S20 : STS · ZH : Hole added	
	43R-Z														●			55/64	1/2	0.187	-	-	0.075	0.020		
	43TR-Z																	55/64	1/2	0.187	1/32	-	0.059	-		
	43TR-ZH						●			●								55/64	1/2	0.187	1/32	-	0.059	-		
	43R															●		55/64	1/2	0.187	-	-	0.075	0.020		
	43R-G																●	55/64	1/2	0.187	-	-	0.075	0.020		
	43TR	●	●	●	●						●			●	●			55/64	1/2	0.187	1/32	-	0.059	-		
	43TR-S20									●								55/64	1/2	0.187	1/32	-	0.059	-		

● : Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01
	Steel	P	●	⬟	⬟	✱	●	⬟	⬟	✱			✱	✱	⬟	⬟		
	Stainless steel	M			⬟	✱				✱	✱		✱	✱				
	Cast iron	K					⬟					●	✱	✱		⬟	●	
	Non-ferrous metal	N															⬟	●
	Heat resistant alloy, Titanium alloy	S								✱			✱	✱				
	Hardened steel	H											⬟	✱				

Machining types

● Continuous cutting
⬟ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	l	d	t	r	d_1	a	b		
TFCN	42PFR																●	1/2	55/64	0.125	-	-	0.095	0.028		E42
	42PFL																	1/2	55/64	0.125	-	-	0.095	0.028		
TNMX	2710AZNR-NM				●	●	●			●		●						1.063	5/8	0.394	1/32	0.22	0.104	-		E52 E53
	2710AZNL-NM																	1.063	5/8	0.394	1/32	0.22	0.104	-		
TPCN	22PPN		●												●	●		0.433	1/4	1/8	-	-	0.028	0.028		E43 E260 E261
	22PPTN																	0.433	1/4	1/8	-	-	0.028	0.028		
	32PDR			●														0.650	3/8	1/8	-	-	0.047	0.028		
	32PPN		●	●								●				●		0.650	3/8	1/8	-	-	0.047	0.047		
	32PPR		●	●											●	●		0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-RH																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-G																●	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPSR																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPTN																	0.650	3/8	1/8	-	-	0.047	0.047		
	32PPTR-RH						●											0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-RH																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PDER-RH										●	●						0.650	3/8	1/8	1/32	-	0.059	-		
	32PDSR-RH										●							0.650	3/8	1/8	1/32	-	0.059	-		
	32PDR-S20									●								0.650	3/8	1/8	-	-	0.047	0.028		
	32PDR-RN																	0.650	3/8	1/8	-	-	0.059	0.039		
	43PDR		●	●										●	●	●		0.866	1/2	3/16	-	-	0.055	0.028		
	43PDR-RH																	0.866	1/2	3/16	-	-	0.055	0.028		
	43PDR-RN																	0.866	1/2	3/16	-	-	0.056	0.020		
	43PDR-G																●	0.866	1/2	3/16	-	-	0.055	0.028		
	43PDL														●			0.866	1/2	3/16	-	-	0.055	0.028		
	43PDSR				●													0.866	1/2	3/16	-	-	0.055	0.028		
	43PDTR																	0.866	1/2	3/16	-	-	0.055	0.028		
	43PPN																	0.866	1/2	3/16	-	-	0.047	0.047		
	43PPTN																	0.866	1/2	3/16	-	-	0.047	0.047		
	43PDER-RH										●	●						0.866	1/2	3/16	1/32	-	0.071	-		
	43PDSR-RH										●							0.866	1/2	3/16	1/32	-	0.071	-		
	43PDR-S20									●								0.866	1/2	3/16	-	-	0.055	0.028		
TPKN-MU	43PDSR-MU							●										0.866	1/2	3/16	1/32	-	0.077	-		E43
TPKN-SU	32PDSL-SU																	0.650	3/8	1/8	0.039	-	0.067	-		E43
	32PDSR-SU							●	●									0.650	3/8	1/8	0.039	-	0.067	-		
	43PDSL-SU							●										0.866	1/2	3/16	0.039	-	0.075	-		
	43PDSR-SU							●	●			●	●					0.866	1/2	3/16	0.039	-	0.075	-		
TPKR-MX	32PDSN-MX																	0.650	3/8	1/8	-	-	0.047	0.047		E43
	32PDSR-MX									●								0.650	3/8	1/8	-	-	0.047	0.028		
	32PPR-MX			●														0.650	3/8	1/8	-	-	0.047	0.039		
	32PPSN-MX			●														0.650	3/8	1/8	-	-	0.047	0.047		
	32PPSR-MX				●													0.650	3/8	1/8	-	-	0.047	0.039		
	43PDR-MX			●														0.866	1/2	3/16	0.039	-	0.055	-		
	43PDSR-MX			●	●													0.866	1/2	3/16	0.039	-	0.055	-		
	43PPR-MX																	0.866	1/2	3/16	0.039	-	0.055	-		

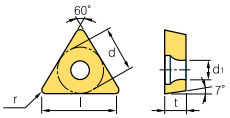
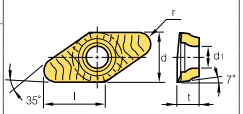
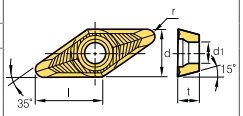
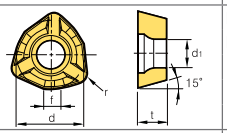
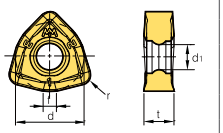
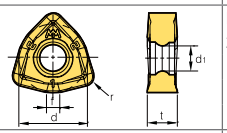
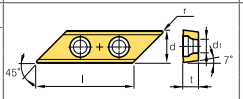
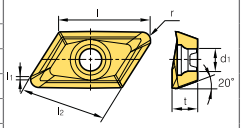
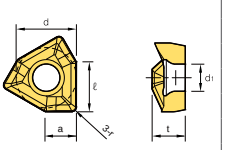
● : Stock item

※TPC(K)N □□□□P~N → For FC·HC
□□□□P~R → For Cutter(face)

Workpiece			P	M	K	N	S	H
	Steel	P	●	⧓				
	Stainless steel	M		⧓				
	Cast iron	K			●			
	Non-ferrous metal	N				●		
	Heat resistant alloy, Titanium alloy	S					⧓	
	Hardened steel	H						⧓

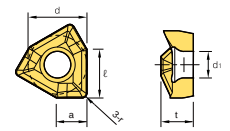
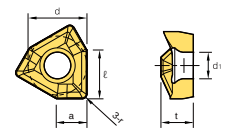
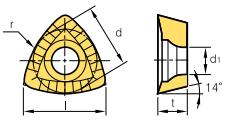
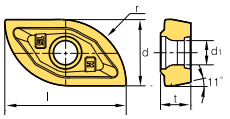
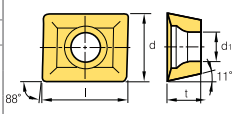
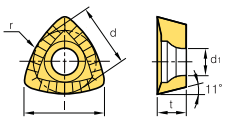
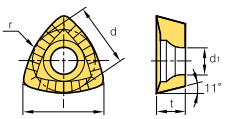
Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)									Geometries	Available tools
		CN2000	CN30	NCM325	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	l	l2	l1	d	t	r	d1	a	f		
TWX-KC	16R-KC				●											0.650	-	-	3/8	5/32	1/32	0.175	-	-		E232
	22R-KC				●											0.866	-	-	1/2	3/16	1/32	0.175	-	-		
VCKT-MA	220530N-MA														●	0.614	-	-	1/2	0.219	0.118	0.220	-	-		E241 E242
VDKT-MA	11T210N-MA														●	0.438	-	-	1/4	0.113	0.047	0.110	-	-		E242 E243
	11T220N-MA															0.264	-	-	1/4	0.113	0.079	0.110	-	-		
WDKT-MH	080316ZDSR-MH				●	●	●	●	●	●	●					-	-	-	5/16	0.125	1/16	0.130	-	0.071		E204~ E208
	10T320ZDSR-MH				●	●		●	●	●	●					-	-	-	25/64	0.156	5/64	0.169	-	0.091		
	130520ZDSR-MH				●	●	●	●	●	●	●					-	-	-	17/32	0.219	5/64	0.219	-	0.122		
	150625ZDSR-MH				●	●		●	●	●	●					-	-	-	19/32	0.250	13/128	0.219	-	0.138		
WNMX-MM	060312ZNN-MM New									●	●					-	-	-	0.250	0.125	0.047	0.113	-	0.047		E196~ E203
	09T316ZNN-MM				●	●		●		●	●					-	-	-	0.375	0.156	0.063	0.142	-	0.067		
	130520ZNN-MM				●	●	●	●		●	●					-	-	-	0.500	0.219	0.079	0.185	-	0.098		
	160720ZNN-MM New									●	●					-	-	-	0.630	0.276	0.079	0.228	-	0.118		
WNMX-MF New	060312ZNN-MF									●	●					-	-	-	0.250	0.125	0.047	0.113	-	0.047		E196~ 203
	09T316ZNN-MF					●				●	●					-	-	-	0.375	0.156	0.063	0.142	-	0.067		
	130520ZNN-MF									●	●					-	-	-	0.500	0.219	0.079	0.185	-	0.098		
	160720ZNN-MF									●	●					-	-	-	0.630	0.276	0.079	0.228	-	0.118		
XCET-KC	310404ER-KC				●								●	●		1.217	-	-	3/8	0.177	1/64	0.173	-	-		E231
XEKT-MA	19M504FR-MA											●			●	0.709	0.646	0.055	-	0.197	0.016	0.173	-	-		E244~ E253
	19M508FR-MA											●			●	0.709	0.646	0.039	-	0.197	0.031	0.173	-	-		
	19M512FR-MA											●			●	0.709	0.646	0.024	-	0.197	0.047	0.173	-	-		
	19M516FR-MA														●	0.689	0.646	0.020	-	0.197	0.063	0.173	-	-		
	19M518FR-MA															0.689	0.646	0.020	-	0.197	0.071	0.173	-	-		
	19M520FR-MA											●			●	0.689	0.646	0.020	-	0.197	0.079	0.173	-	-		
	19M530FR-MA														●	0.669	0.646	0.028	-	0.197	0.118	0.173	-	-		
	19M532FR-MA											●			●	0.669	0.646	0.020	-	0.197	0.126	0.173	-	-		
	19M540FR-MA											●			●	0.650	0.646	0.020	-	0.197	0.157	0.173	-	-		
	19M550FR-MA											●			●	0.630	0.646	0.016	-	0.197	0.197	0.173	-	-		
	250604FR-MA														●	0.965	0.862	0.059	-	0.250	0.016	0.236	-	-		
	250608FR-MA														●	0.965	0.862	0.047	-	0.250	0.031	0.236	-	-		
	250612FR-MA														●	0.965	0.862	0.031	-	0.250	0.047	0.236	-	-		
	250616FR-MA															0.965	0.862	0.016	-	0.250	0.063	0.236	-	-		
	250620FR-MA														●	0.945	0.862	0.020	-	0.250	0.079	0.236	-	-		
	250630FR-MA															0.933	0.862	0.024	-	0.250	0.118	0.236	-	-		
	250632FR-MA														●	0.933	0.862	0.016	-	0.250	0.126	0.236	-	-		
	250640FR-MA															0.898	0.862	0.047	-	0.250	0.157	0.236	-	-		
	250650FR-MA														●	0.894	0.862	0.016	-	0.250	0.197	0.236	-	-		
XNCT-MA New	080508PNFR-MA														●	0.323	-	-	0.394	0.217	0.031	0.177	0.114	-		E67~ E69

● : Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	⧔ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated								Uncoated			Dimensions (inch)								Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	l2	l1	d	t	r	d1	a	
XNKT-ML	060405PNER-ML						●			●	●	●				0.224	-	-	0.256	0.157	0.020	0.134	0.071		E66~E69
	080508PNER-ML						●			●	●	●				0.323	-	-	0.394	0.217	0.031	0.177	0.114		
XNKT-MM	060405PNSR-MM						●			●	●	●				0.224	-	-	0.256	0.157	0.020	0.134	0.071		E66~E69
	080508PNSR-MM						●			●	●	●				0.323	-	-	0.394	0.217	0.031	0.177	0.114		
	080812PNSR-MM															0.323	-	-	0.394	0.217	0.047	0.177	0.114		
	080516PNSR-MM															0.323	-	-	0.394	0.217	0.063	0.177	0.114		
	080520PNSR-MM															0.323	-	-	0.394	0.217	0.079	0.177	0.114		
ZDMT-R-MM	080310R-MM					●					●					21/64	-	-	0.265	0.126	0.394	0.110	-		E227
	110312.5R-MM					●					●					27/64	-	-	0.334	0.144	0.492	0.110	-		
	130416R-MM					●					●					33/64	-	-	0.413	0.187	0.630	0.173	-		
ZPET-MM Internal	080M-MM															0.630	-	-	0.315	0.138	0.315	0.114	-		E225 E226
	090M-MM															0.697	-	-	0.284	0.169	0.354	0.134	-		
	100M-MM					●					●					0.748	-	-	0.409	0.177	0.394	0.134	-		
	110M-MM															0.874	-	-	0.433	0.189	0.433	0.177	-		
	125M-MM					●					●					0.945	-	-	0.508	0.209	0.492	0.177	-		
	130M-MM															1.012	-	-	0.512	0.209	0.512	0.177	-		
	140M-MM															1.071	-	-	0.551	0.248	0.551	0.221	-		
	150M-MM					●					●					1.102	-	-	0.606	0.276	0.591	0.220	-		
	160M-MM					●					●					1.122	-	-	0.646	0.276	0.630	0.220	-		
	200M-MM					●										1.496	-	-	0.815	0.315	0.787	0.260	-		
	250M-MM															1.890	-	-	1.020	0.374	0.984	0.339	-		
ZPET-MM External	080S-MM															0.591	-	-	0.260	0.315	0.315	0.114	-		
	090S-MM															0.610	-	-	0.291	0.146	0.354	0.134	-		
	100S-MM					●					●					0.610	-	-	0.331	0.394	0.394	0.134	-		
	110S-MM															0.713	-	-	0.354	0.173	0.433	0.177	-		
	125S-MM					●					●					0.807	-	-	0.421	0.492	0.492	0.177	-		
	130S-MM															0.874	-	-	0.433	0.173	0.519	0.177	-		
	140S-MM															0.949	-	-	0.433	0.224	0.551	0.221	-		
	150S-MM					●					●					0.984	-	-	0.488	0.591	0.591	0.220	-		
	160S-MM					●					●					1.024	-	-	0.528	0.630	0.630	0.220	-		
	200S-MM					●										1.260	-	-	0.657	0.787	0.787	0.260	-		
	250S-MM															1.575	-	-	0.815	0.984	0.984	0.339	-		
ZPMT-MM	1504PPSR-MM					●		●			●					5/8	-	-	1/2	0.187	-	0.220	-		E209
	1505PPSR-MMN					●		●			●					5/8	-	-	1/2	0.227	-	0.220	-		
ZPMT-R-MM	160520R-MM					●					●					81/128	-	-	1/2	0.219	0.787	0.220	-		E227
	160525R-MM					●					●					81/128	-	-	1/2	0.219	0.984	0.220	-		
	160531.5R-MM					●					●					11/16	-	-	1/2	0.219	1.240	0.220	-		
ZPMT-R-MR	160525R-MR															11/16	-	-	1/2	0.219	0.984	0.220	-		E227

● : Stock item

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Mill-max	ADNA 4000/5000+		45°	Ø3~Ø12	Excellent cutting edge strength and chip flow	●					E34 E35
		AEA 4000/5000		45°	Ø3~Ø12	Low cutting load and good machinability	●					E36 E37
		EFA 4000	Al 	15°	Ø3~Ø12	High rake angle to prevents welding	●					E38
		ENA 4000		15°	Ø3~Ø12	Economical because double sided inserts applied	●					E39
		EPNA 4000/5000+		15°	Ø3~Ø12	Double posi rake angle and low cutting force	●					E40 E41
		PFA 4000	Al 	0°	Ø3~Ø12	High rake angle and good machinability	●	●	●			E42
		PPNA 4000		0°	Ø3~Ø12	Double posi rake angle and low cutting force	●	●	●			E43
	Turbo Mill	ADSA 4000/5000		45°	Ø0.75~Ø2.5	Anti-vibration	●					E44 E45
		PESA 2000/3000/ 4000		0°	Ø2~Ø2.5	High rake angle, Cutting efficiency	●	●	●			E46
	Double Mill	AFOA4000		45°	Ø3~Ø5	High rake angle low cutting force Economical (8 corners available)	●					E47 E48
		AFOA5000			Ø3~Ø12		●					
	Power Buster	PBACA5000		45°	Ø3~Ø12	Double sided Insert High depth High Feed Roughing						E52

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Power Buster	PBZCA5000		10°	Ø3~Ø12	Double sided Insert High depth High Feed Roughing	●					E53
	Aero Mill	APDA A Type, B Type	Al 	0°	Ø3~Ø12	Aluminum cutter body suitable for high speed machining, Both cemented carbides and PCD inserts are available, G2.5 balance possible	●					E105 E106
	Aero Mill Plus	APDA-PB	Al 	0°	Ø3~Ø12	Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing.	●					E107 E108
	Aero Mill Mini	MAPDSA New	Al 	0°	Ø1.25~Ø1.5	Available with small Machining center-Carbide, PCD insert Application-Balancing class G2.5	●					E109
		MAPDA New	Al 	0°	Ø1.5~Ø2.5		●					E109
	Rich Mill	RM8ACA4000 RMH8ACA4000 New		45°	Ø2~Ø15	8 corners available Double sided insert for steel, cast iron, stainless steel, aluminum	●					E85 E86 E87 E88
		RM8ACA5000 RMH8ACA5000 New			Ø3~Ø15		●					
		RM8ECA4000 RMH8ECA4000 New		15°	Ø2~Ø15	8 corners available Double sided insert for steel, cast iron	●					E89 E90 E91 E92
		RM8ECA5000 RMH8ECA5000 New			Ø3~Ø15		●					
		RM8QCA4000 RMH8QCA4000		2°	Ø2.5~Ø8	8 corners available Reduced cutting interruption at cast Iron	●					E93 E94
		RMT8AA 4000/5000		45°	Ø3~Ø12	Easy insert change and good machinability due to latch clamping system	●					E95 E96
		RMT8EA 4000/5000		15°	Ø3~Ø12	8 corners available Excellent surface finish	●					E97 E98

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Rich Mill	RMT8QA		2°	Ø3~Ø12	Easy insert change and good machinability due to latch clamping system 8 corners available Excellent surface finish	●					E99
		RM16ACA 6000/8000		45°	Ø2.5~Ø15	16 corners available. Wiper inserts can be applied for good surface finish Strong insert and powerful clamping	●					E100 E101
Cutters for molds	Rich Mill	RM3PCA3000 New		0°	Ø1.5~Ø3	Perfect perpendicularity Strong clamping	●	●	●		●	E66 E67
		RM3PCA4000 New			Ø1.5~Ø5							
		RM4PCA3000		0°	Ø1.5~Ø4	4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity.	●	●	●			E70 E71
		RM4PCA4000			Ø2~Ø6							
		RM4ZCA3000 New		0°	Ø1.5~Ø2	In vertical machining, the maximum cutting depth for RM4Z3000: 9.00mm, RM4Z4000: 14.0mm	●	●	●			E83
		RM4ZCA4000 New			Ø2.5~Ø4							
	Alpha Mill	AMCA 1000S/1500S/ 2000S		0°	Ø1.5~Ø4	3 dimensional shape and high rake angle lowers cutting load and ensures better chip evacuation. Inner coolant system for better chip control increases tool life. Wide size range of inserts enlarges application range. Various types of Alpha Mills available for high depth of cut and high feed machining.	●	●	●	●	●	E116 ~E118
		AMCA 3000S/3000S-K /4000S		0°	Ø1.5~Ø5		●	●	●	●	●	E119 ~E121
		AMCA 1000SE/2000SE 3000SE		15°	Ø1.5~Ø4		●					E122 E123
		AMCA 2000M/3000M 4000M		0°	Ø2~Ø5		●	●	●	●	●	E124 E125 E126
	Future Mill	FMACA3000		45°	Ø2~Ø5	Accurate inserts and cutter, Excellent chip flow	●					E158 E159
		FMACA4000			Ø2~Ø8							
		FMACA3000A		45°	Ø2.5~Ø5	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●					E160 E161
		FMACA4000A			Ø2.5~Ø12							
		FMPCA3000		0°	Ø2~Ø4	4 corners available various inserts can be applied to machine for different types of workpiece	●	●	●			E164 E165
		FMPCA4000			Ø2.5~Ø5							

AI Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill	FMPCA3000A		0°	Ø2.5~Ø4	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●	●	●			E166 E167
		FMPCA4000A			Ø2.5~Ø12							
		FMRCA3000		-	Ø1.5~Ø4	4~8 corners available Double contact faces between insert & seat part of cutter for stable clamping Excellent rotating-free machining	●				●	E170 E171
		FMRCA4000			Ø2~Ø5							
		FMRCA5000		-	Ø2~Ø5		●				●	E172 E173
		FMRCA6000			Ø2.5~Ø6							
	Future Mill P-positive	FMRCA 3000 4000 5000 6000 New		-	Ø1.5~Ø8	Stable clamping system enables stable machining and productivity. Varied product line-up ensures wide application range. Optimal shape and grade with high hardness for hard-to-cut material machining.	●				●	E182 ~E185
	HRM	HRMCA13		75°	Ø2~Ø3	Powerful clamping by double clamping system 3 corners available high feed cutting with low cutting load	●	●	●	●	●	E204
		HRMCA15			Ø2.5~Ø6							
	HRMD	HRMDCA09		76°	Ø1.5~Ø4	Double side insert with 6 corner High feed cutting with strong simple screw-on clamp	●	●	●	●	●	E196 ~E198
		HRMDCA13			Ø2~Ø5							
		HRMDCA16 New			Ø3~Ø12							
Cutters for aluminum	Pro-A Mill	PACA 2000/4000	Al 	0°	Ø1.5~Ø4	Buffed insert controls chip flow without built-up edge	●	●	●	●	●	E241
	Pro-X Mill	PAXCA5000	Al 	0°	Ø1.5~Ø5	Powerful clamping Excellent body rigidity for rectangular and curve machining	●	●	●	●	●	E244 E245
		PAXCA6000			Ø2~Ø5							
	Pro-L Mill	PALCA	Al 	0°	Ø2.5	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E249
High feed cutter for cast iron	High feed cutter	ANHA 4000/5000		45°	Ø4~Ø18	Excellent cutting strength Good chip flow	●					E278 E279
		CDHA 4000/5000		25°	Ø4~Ø18	Double positive rake angle Minimized cutting load	●					E280 E281
		DEHA 5000		30°	Ø4~Ø18	For aluminum & aluminum alloy. Hexagonal insert available.	●					E282

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
High feed cutter for cast iron	High feed cutter	DPHA 5000		30°	Ø4~Ø18	Hexagonal insert available Economical cutter	●					E283
		PNHA 4000/5000		0°	Ø5~Ø18	Wiper insert available Double negative rake angle Excellent surface finish	●					E284
		PPHA 4000		0°	Ø5~Ø18	Square insert and wiper insert available Excellent surface finish	●					E285
	Shave Mill	SVMA4000		0°	Ø3~Ø12	Exclusive adjusting device of cutting edge adjusts run-out easily.	●					E286
	Shave Mill Ultra	SVUA6000		0°	Ø3~Ø12	Good rigidity and economical due to Screw on Simple type	●					E287
		SVUA6000-B		0°	Ø3~Ø12	Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts	●					E288
Indexable side cutter	Tangential type Full-side cutter	TAFCPA		-	Ø4~Ø12	Various cutting depth can be possible because of adjustable length control. Medium to Roughing based on strengthened edge		●	●			E256
		TAFCBA		-	Ø4~Ø12		●	●	●			E256
	Tangential type Half-side cutter	TAHCPA		-	Ø4~Ø12			●	●			E257
		TAHCBA		-	Ø4~Ø12		●	●	●			E257
	Radial type Full-side cutter	RAFCPA		-	Ø4~Ø12	Wide range of machining width with only one side cutter due to adjustable cutting edge height		●	●			E258
		RAFCBA		-	Ø4~Ø12	Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker	●	●	●			E258

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Indexable side cutter	Radial type Half-side cutter	RAHCPA		-	Ø4~Ø12	Wide range of machining width with only one side cutter due to adjustable cutting edge height Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker		●	●			E259
		RAHCBA		-	Ø4~Ø12		●	●	●			E259
Side cutter	Full-side cutter	FCA		-	Ø3~Ø12	Good chip evacuation with low cutting load Effective cutting		●	●			E260
	Half-side cutter	HCA		-	Ø4~Ø12	Good chip evacuation with low cutting load Effective cutting		●	●			E261
	-	SPPA		-	Ø3~Ø8	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E262
		SPBA		-	Ø3~Ø8	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E263
		SPSA		-	Ø2~Ø8	For narrow and deep width grooving			●			E264
	Full-side cutter	RM4PFCBA		-	Ø3~Ø6	4 corner usage with double-sided insert can be economical			●			E72 E73
		RM4PFCPA		-	Ø3~Ø6				●			E76 E77
	Half-side cutter	RM4PHCBA		-	Ø3~Ø6	4 corner usage with double-sided insert can be economical			●			E74 E75
		RM4PHCPA		-	Ø3~Ø6				●			E78 E79
	Wind Mill	WFSBA New		-	Ø3~Ø8	The nose R shape of insert ensures long toollife. Wide applications with various widths and corner R sizes.	●	●	●			E296

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Side cutter	Wind Mill	WFSPA New		-	Ø3~Ø8	The nose R shape of insert ensures long toollife. Wide applications with various widths and corner R sizes.		●	●			E268
Cutters for face milling	Turbo Mill	ADSA 4000/5000		45°	Ø2~Ø2.5	Uneven insert spacing prevents chattering	●					E44 E45
		PESA 2000/3000/ 4000		0°	Ø0.75~Ø2.5	Good machinability due to the high rake angle	●	●	●			E46
Cutters for molds	Rich Mill	RM3PSA3000 New		0°	Ø0.75~Ø1.5	Perfect perpendicularity Strong clamping	●	●	●		●	E68 E69
		RM3PSA4000 New			Ø1.25~Ø2.5							
		RM4PSA3000		0°	Ø0.562~Ø2	4 corners available High rake angle insert reduces cutting force Excellent insert rigidity	●	●	●		●	E80
		RM4PSA4000			Ø1.25~Ø2.5		●	●	●		●	E81
		RM4ZSA3000 New		0°	Ø1~Ø1.5	In vertical machining, the maximum cutting width : 9.0mm	●	●	●		●	E84
	Alpha Mill	AMSA 1000S/1500S 2000S/3000S 3000S-K/4000S		0°	Ø0.438~Ø2.5	The combination of a 3 dimensional curve design & high rake angle helps chip-evacuation effectively with a low cutting force Inner coolant system The various range of inserts can provide the widened choice High depth and high feed can be available during operation	●	●	●	●	●	E127 ~E134
		AMSA 1000SE 2000SE 3000SE		15°	Ø1~Ø2.5		●					E135 E136
		AMSA 1000M/1500M 2000M/4000M		0°	Ø0.625~Ø2		●	●	●	●	●	E137 E138
		AMSA 1000MH/1500MH 2000MH/3000MH		0°	Ø0.562~Ø1.5		●	●	●	●	●	E139
	Future Mill	FMASA3000		45°	Ø1~Ø2.5	For precision machining Excellent chip evacuation	●					E162 E163
		FMASA4000			Ø2~Ø2.5							
		FMPSA3000		0°	Ø1~Ø2.5	4 corners available Strong cutting edge with low cutting load	●					E168 E169
		FMPSA4000			Ø1.5~Ø2.5							

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill	FMRSA 1000/1500/2000 2500/3000/4000 5000/6000		-	Ø0.312~Ø2.5	2 touch clamping system, convenient insert change	●	●	●	●	●	E174 ~179
	Future Mill P-positive	FMRSA 2500/3000 4000/5000 6000		-	Ø0.688~Ø2	P-positive relief angle ensures high rigidity and high machinability in die steel and high-resistant alloy machining. Flat clearance face of insert prevents interference and revolution while machining. Optimal grades and chip breakers for various workpieces	●	●	●	●	●	E186 ~E189
	HRM	HRMSA 08/10/13/15		75°	Ø0.75~Ø2.5	Powerful clamping by double clamping system 3 corners available High feed cutting with low cutting load	●	●	●	●	●	E205 E206 E207
	HRMD	HRMDSA 06 New 09/13		76°	Ø0.68~Ø2.5	6 conners available, High feed, multi-function, Only one screw can show comfortable application	●	●	●	●	●	E199
	Tank Mill	THEA		0°	Ø0.984~Ø1.968	Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting edge	●	●				E209
	Laser Mill	LBEA□□ LREA□□		-	Ø0.312~Ø1.5	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available	●	●	●	●		E220 ~E223
		LBEA□□-C LREA□□-C		-	Ø0.312~Ø1.5	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available Carbide shank	●	●	●			E220 E222
	Mach Mill	BFEA		-	Ø0.625~Ø1.25	Upgraded cutting performance with S type curve design V clamping application	●	●	●	●		E224
		GBEA GBEA-M		-	Ø0.63~Ø1.969	Helical design of edge can reduce the force during operation. Safe application to prevent rotation guarantee the increased tool life	●	●	●	●		E225
		BREA		-	Ø0.787~Ø2.48	Flute type chip-pocket can make chip-evacuation Customized edge design can prevent the breakage of holder's body	●	●	●	●		E227

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Chamfer tool	CEA		15°	Ø1~Ø1.217	For Back & Front high quality champering and various Chamfering angle machining	●					E230
				30°	Ø1~Ø1.413							
				45°	Ø0.281~Ø1.587							
				60°	Ø1~Ø1.72							
				60°	Ø0.203~Ø1.384	Various chamfer Degrees available Effective long chamfer cutting available	●	●	●			E231
				45°	Ø0.203~Ø1.896							
				30°	Ø0.203~Ø2.278							
				45°	Ø0.87~Ø1.14	Center Ring, Grooving, Chamfer Ring	●	●	●		●	E232
	T-Cutter	TFEA		0°	Ø0.83~Ø1.97	For slotting	●	●	●	●	●	E233
Cutters for aluminum	Pro-A Mill	PASA 4000	Al 	0°	Ø0.5~Ø1.5 Ø1.25~Ø1.5	Polished face increases chip flow and reduces built-up edge	●	●	●	●	●	E250
	Pro-X Mill	PAXSA 5000/6000	Al 	0°	Ø0.75~Ø1.5 Ø1.25~Ø1.5	Square shoulder and conter machining	●	●	●	●	●	E251
	Pro-L Mill	PALSA-HR New	Al 	0°	Ø1.25~Ø2.5	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E242
		PALSA-HM New	Al 		Ø2.5		●	●	●	●	●	E246 E247
Thread milling	-	TM		-	Ø1.5~Ø2	For internal and external threading	●					D49

Al Cutter for Aluminum

FMRMA type
E197, 198, 207

LBEA-MHD type
E241

PAMA type
E271

PAXMA type
E276

AMMA type
E140, 141, 142

RM4PMA type
E82

RM4ZMA type
E84

HRMMA type
E227

HRMDMA type
E221, 222

GBEMA type
E245

Steel Shank type
E281

Carbide Shank type
E282

ADNA4000

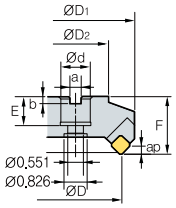


Fig. 1

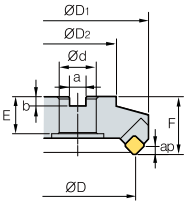


Fig. 2

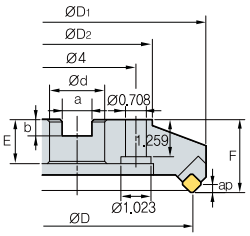


Fig. 3

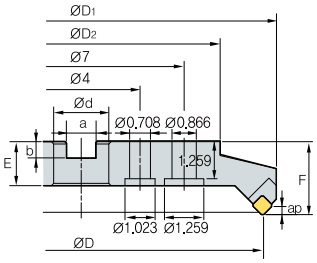


Fig. 4

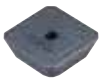
AA 45°
- AR : 15°
- RR : -4°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
ADNA	4300R/L	4	3	3.98	2.205	1	0.375	0.248	0.866	2.0	0.24	4.2	1
	4400R/L	5	4	4.98	2.874	1 1/4	0.500	0.319	0.866	2.0	0.24	5.5	2
	4500R/L	6	5	5.94	3.389	1 1/2	0.625	0.394	1.181	2.5	0.24	9.5	2
	4600R/L	8	6	6.91	4.882	2	0.750	0.433	1.181	2.5	0.24	14.1	2
	4800R/L	10	8	8.91	5.118	2 1/2	1.000	0.551	1.496	2.5	0.24	19.1	3
	41000R/L	12	10	10.91	7.087	2 1/2	1.000	0.551	1.496	2.5	0.24	30.8	3
	41200R/L	14	12	12.91	9.449	2 1/2	1.000	0.551	1.496	2.5	0.24	46.2	4

Available Inserts


SDCN


SDKN-MU


SDKN-SU

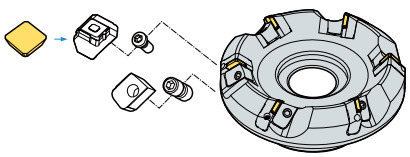

SDKR-MX

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M													●		E13
	42M-G														●	
	42MT	●	●		●								●			
	42MT-RH															
	42MT-S20								●							
	42AEEN															
	42AEEN-RH															
	42AESN															
	42AESN-RH															
SDKN	42AESN-MU						●									E14
	42AESN-SU						●				●	●				
SDKR	42AESN-MX															E14
	42AETN-MX															
	42AEN-MX			●												

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LADN4R/L	WEPN4R/L	DHA0821F	LTX0514	HW40

Available Inserts E13, E14

ADNA5000+

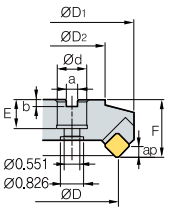


Fig. 1

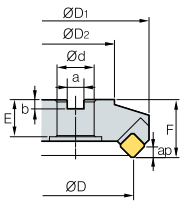


Fig. 2

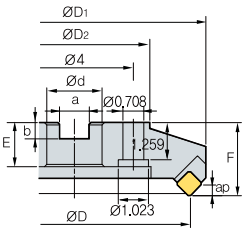


Fig. 3

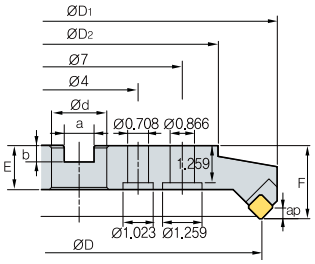


Fig. 4

AA 45°

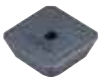
- AR : 15°
- RR : -4°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig
ADNA	5300R/L+	4	3	4.07	2.205	1	0.374	0.248	0.866	2.0	0.32	4.4	1
	5400R/L+	5	4	5.02	2.874	1 1/4	0.500	0.319	0.866	2.0	0.32	5.9	2
	5500R/L+	6	5	5.98	3.389	1 1/2	0.625	0.394	1.181	2.5	0.32	9.5	2
	5600R/L+	8	6	6.98	4.882	2	0.750	0.433	1.181	2.5	0.32	14.3	2
	5800R/L+	10	8	8.98	5.118	2 1/2	1.000	0.551	1.496	2.5	0.32	20.0	3
	51000R/L+	12	10	10.98	7.087	2 1/2	1.000	0.551	1.496	2.5	0.32	31.9	3
	51200R/L+	14	12	12.98	9.449	2 1/2	1.000	0.551	1.496	2.5	0.32	46.2	4

Available Inserts


SDCN


SDKN-MU

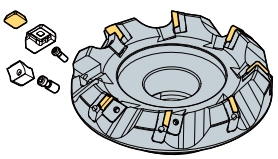

SDKN-SU


SDKR-MX

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M												●			E13
	53M-G														●	
	53MT		●	●									●			
	53MT-RH					●										
	53MT-S20								●							
	53AEEN															
	53AEEN-RH									●	●					
	53AESN															
	53AESN-RH									●						
SDKN	53AESN-MU						●									E14
	53AESN-SU						●				●	●				
SDKR	53AESN-MX				●											E14
	53AETN-MX															
	53AEN-MX			●												

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling	

Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LADN5R/L	WHPS5R/L	WHX0817	LTX0514	HW40

Available Inserts E13, E14

AEA4000

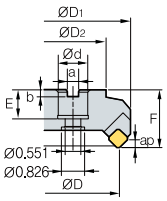


Fig. 1

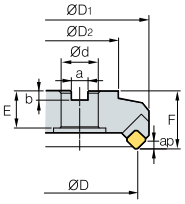


Fig. 2

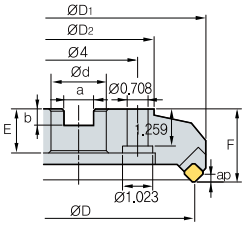


Fig. 3

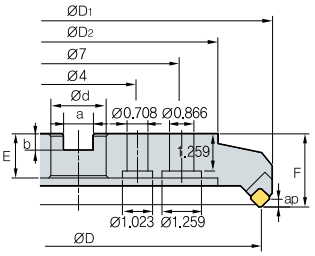


Fig. 4

• AR : 20°
• RR : -3°

(inch)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AEA	4300R/L	4	3	3.91	2.205	1	0.375	0.248	0.866	2.0	0.22	3.70	1
	4400R/L	5	4	4.87	2.874	1 1/4	0.5	0.319	0.866	2.0	0.22	6.40	2
	4500R/L	6	5	5.83	3.389	1 1/2	0.625	0.394	1.181	2.5	0.22	9.70	2
	4600R/L	8	6	6.83	4.882	2	0.75	0.433	1.181	5.5	0.22	13.40	2
	4800R/L	10	8	8.79	5.118	2 1/2	1.000	0.551	1.496	2.5	0.22	19.60	3
	41000R/L	12	10	10.79	7.087	2 1/2	1.000	0.551	1.496	2.5	0.22	34.50	3
	41200R/L	15	12	12.79	9.449	2 1/2	1.000	0.551	1.496	2.5	0.22	55.20	4

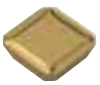
Available Inserts


SECN


SEKN-SU


SEKR-MF1

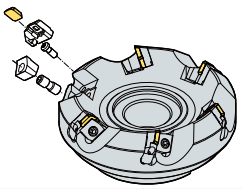

SEKR-MX


SEKR-X35

Designation		Cermet		Coated							Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	42AFFN													●	●	E15
	42AFTN	●	●										●			
	42AFEN															
	42AFSN			●	●											
	42AFEN-RH									●	●					
	42AFTN-RH					●										
	42AFTN-S20								●							
SEKN	42AFSN-SU						●	●								E15
SEKR	42AFSN-MF1															E16
	42AFSN-MX		●	●	●				●							
	42AFSN-X35															
	42AFFN-X35															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling	

Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LAE4R/L	WAE4R/L	DHA0821F	LTX0512	HW40

Available Inserts E15, E16

AEA5000

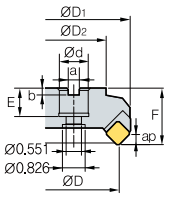


Fig. 1

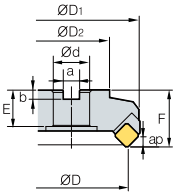


Fig. 2

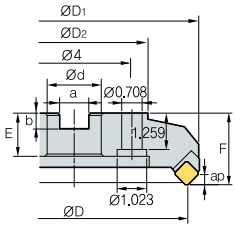


Fig. 3

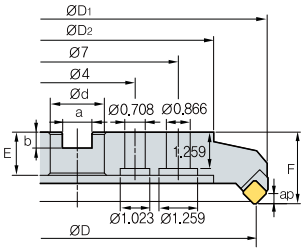


Fig. 4

AA 45°

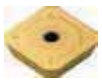
- AR : 20°
- RR : -3°

(inch)

Designation		◎	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AEA	5300R/L	4	3	3.91	2.205	1	0.375	0.248	0.866	2.0	0.30	3.7	1
	5400R/L	5	4	4.87	2.874	1 1/4	0.500	0.319	0.866	2.0	0.30	6.4	2
	5500R/L	6	5	5.83	3.389	1 1/2	0.625	0.394	1.181	2.5	0.30	9.7	2
	5600R/L	8	6	6.83	4.882	2	0.750	0.433	1.181	2.5	0.30	13.4	2
	5800R/L	10	8	8.79	5.118	2 1/2	1.000	0.551	1.496	2.5	0.30	19.6	3
	51000R/L	12	10	10.79	7.087	2 1/2	1.000	0.551	1.496	2.5	0.30	34.5	3
	51200R/L	15	12	12.79	9.449	2 1/2	1.000	0.551	1.496	2.5	0.30	55.2	4

Available Inserts


SECN

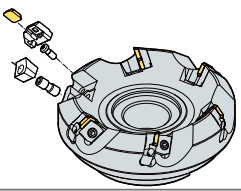

SEKN-SU


SEKR-MX

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	53AFFN												●			E15
	53AFTN		●									●				
	53AFEN															
	53AFSN			●												
	53AFEN-RH															
	53AFSN-RH									●						
	53AFTN-S20															
SEKN	53AFSN-SU						●	●								E15
	53AFSN-MX															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

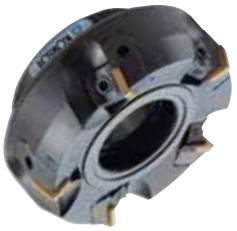
Assembling	

Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LAE5R/L	WAE5R/L	DHA0821F	LTX0512	HW40

Available Inserts E15

EFA4000



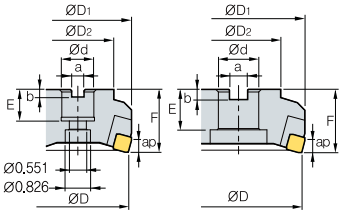


Fig. 1 Fig. 2

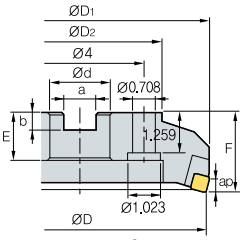


Fig. 3

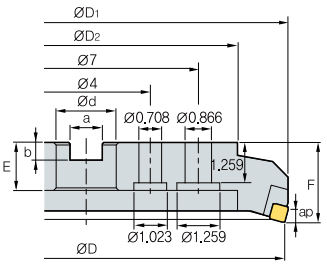


Fig. 4

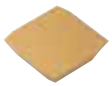
AA 15°

- AR : 18°
- RR : 11°

(inch)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
EFA	**4300R/L**	4	3	3.35	2.205	1	0.375	0.248	0.866	2.0	0.32	3.3	1
	4400R/L	5	4	4.31	2.874	1 1/4	0.500	0.319	0.866	2.0	0.32	4.6	2
	4500R/L	6	5	5.31	3.389	1 1/2	0.625	0.394	1.181	2.5	0.32	8.4	2
	4600R/L	8	6	6.31	4.882	2	0.750	0.433	1.181	2.5	0.32	12.1	2
	4800R/L	10	8	8.31	5.118	2 1/2	1.000	0.551	1.496	2.5	0.32	18.0	3
	41000R/L	12	10	10.28	7.087	2 1/2	1.000	0.551	1.496	2.5	0.32	29.5	3
	41200R/L	16	12	12.28	9.449	2 1/2	1.000	0.551	1.496	2.5	0.32	46.6	4

Available Inserts



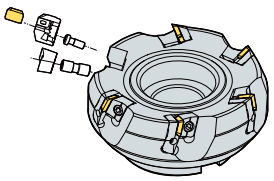
SFCN

Designation	Cermet		Coated								Uncoated			page
	CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SFCN **42EFR**													●	●	E16

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	1.200~1.500	0.002 ~ 0.008	**H01**

Assembling



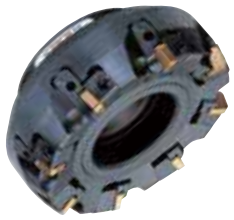
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEF4R/L LEF4R1*/L1*	WEFR/L	DHA0821F	LTX0512	HW40

* : Ø3~Ø4

Available Inserts **E16**

ENA4000



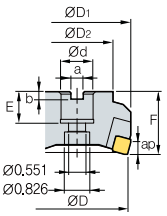


Fig. 1

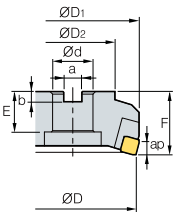


Fig. 2

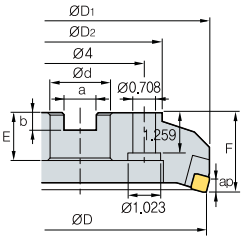


Fig. 3

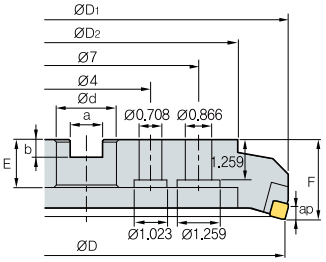


Fig. 4

- AR : -6°
- RR : -5°

(inch)

Designation		⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig
ENA	**4300R/L**	5	3	3.28	2.205	1	0.375	0.248	0.866	2.0	0.33	3.1	1
	4400R/L	6	4	4.28	2.874	1 1/4	0.500	0.319	0.866	2.0	0.33	4.6	2
	4500R/L	8	5	5.28	3.389	1 1/2	0.625	0.394	1.181	2.5	0.33	8.4	2
	4600R/L	10	6	6.28	4.882	2	0.750	0.433	1.181	2.5	0.33	12.5	2
	4800R/L	12	8	8.28	5.118	2 1/2	1.000	0.551	1.496	2.5	0.33	18.5	3
	41000R/L	16	10	10.28	7.087	2 1/2	1.000	0.551	1.496	2.5	0.33	30.4	3
	41200R/L	20	12	12.28	9.449	2 1/2	1.000	0.551	1.496	2.5	0.33	47.5	4

Available Inserts

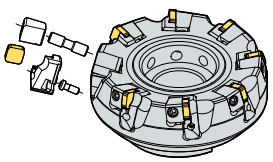

SNCN


SNKN

Designation	Cermet		Coated								Uncoated			page
	CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCN **43ENN**			●									●			E16
SNKN **1204ENN**									●						E18

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	**NCM325** **PC3500** **ST30A**
M	150~600 150~400	0.002~0.008 0.002~0.008	**PC9530** **ST30A**
K	500~900 300~600	0.002~0.120 0.002~0.012	**PC6510** **G10**

Assembling	

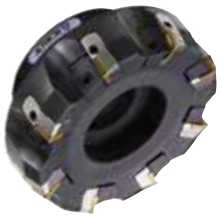
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEN4R/L	WENR/L WENR1*/L1*	DHA0830 DHA0825*	LTX0512	HW40

* : Ø80~Ø100

Available Inserts **E16, E18**

EPNA4000



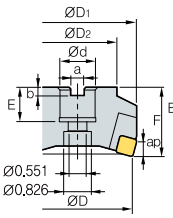


Fig. 1

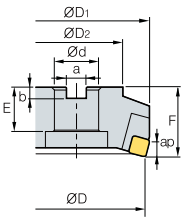


Fig. 2

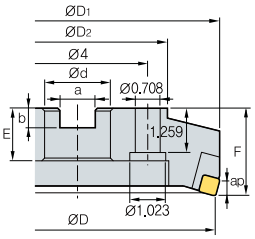


Fig. 3

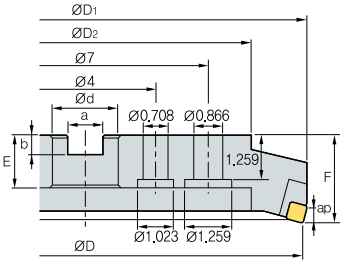


Fig. 4

AA 15°
- AR : 7°
- RR : 0°

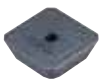
(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig
EPNA	4300R/L	5	3	3.31	2.205	1	0.375	0.248	0.866	2.0	0.35	3.1	1
	4400R/L	6	4	4.28	2.874	1 1/4	0.500	0.319	0.866	2.0	0.35	4.6	2
	4500R/L	8	5	5.28	3.389	1 1/2	0.625	0.394	1.181	2.5	0.35	8.4	2
	4600R/L	10	6	6.24	4.882	2	0.750	0.433	1.181	2.5	0.35	12.5	2
	4800R/L	12	8	8.24	5.118	2 1/2	1.000	0.551	1.496	2.5	0.35	18	3
	41000R/L	16	10	10.24	7.087	2 1/2	1.000	0.551	1.496	2.5	0.35	29.7	3
	41200R/L	20	12	12.24	9.449	2 1/2	1.000	0.551	1.496	2.5	0.35	46.4	4

Available Inserts


SPCN


SPKN-SU


SPKN-MU

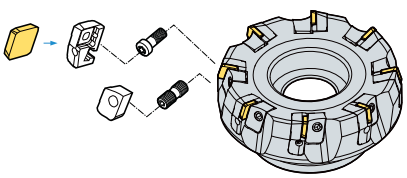

SPKR-MX


SPEX

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	
SPCN	42EDR		●	●	●									●	●	●	E19
	42EDL													●			
	42EDR-G															●	
	42EDER-RH																
	42EDSR-RH									●							
	42EDTR-RH																
	42EDR-S20								●								
SPKN	42EDSR-MU						●										E20
	42EDSR-SU						●	●			●	●					
	42EDSL-SU						●										E20
SPKR	42EDSR-MX			●	●	●											E20
	42EDSL-MX			●													
SPEX	42EDR/L-1																E20

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling	

Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEPN4R/L LEPN4R1*/L1*	WEPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

* : Ø3~Ø4

Available Inserts E19, E20

EPNA5000+

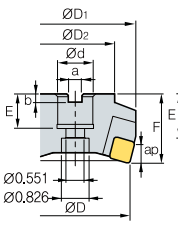


Fig. 1

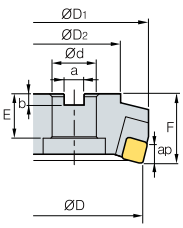


Fig. 2

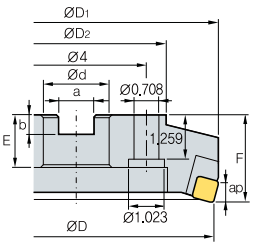


Fig. 3

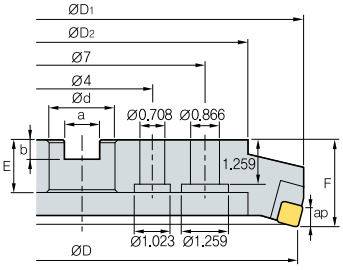


Fig. 4

- AR : 7°
- RR : 0°

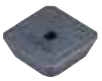
(inch)

Designation		⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
EPNA	5300R/L+	5	3	3.42	2.205	1	0.374	0.248	0.866	2.0	0.47	3.8	1
	5400R/L+	6	4	4.35	2.874	1 1/4	0.500	0.319	0.866	2.0	0.47	5.5	2
	5500R/L+	8	5	5.38	3.389	1 1/2	0.625	0.394	1.181	2.5	0.47	8.4	2
	5600R/L+	10	6	6.36	4.882	2	0.750	0.433	1.181	2.5	0.47	12.1	2
	5800R/L+	12	8	8.36	5.118	2 1/2	1.000	0.551	1.496	2.5	0.47	17.6	3
	51000R/L+	16	10	10.36	7.087	2 1/2	1.000	0.551	1.496	2.5	0.47	32.6	3
	51200R/L+	20	12	12.35	9.449	2 1/2	1.000	0.551	1.496	2.5	0.47	49.4	4

Available Inserts


SPCN


SPKN-SU


SPKN-MU


SPKR-MX

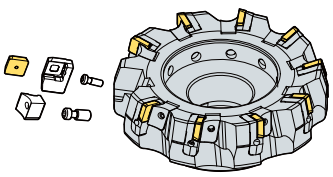

SPEX

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	
SPCN	5312T																
	53EDR		●	●										●	●		
	53EDSR																
	53EDL									●							
	53EDR-G															●	E19
	53EDER-RH									●	●						
	53EDSR-RH									●							
	53EDTR-RH					●											
	53EDR-S20								●								
SPKN	53EDSR-MU						●										
	53EDSR-SU						●	●			●	●					E20
	53EDSL-SU						●										
SPKR	53EDR-MX			●													E20
	53EDSR-MX				●	●											
SPEX	53EDR/L-1																

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~12	LEPN5R/L LEPN5R1*/L1*	WHPS5R/L	WHX0817 WHX0813*	LTX0514	HW40

Available Inserts E19, E20

* : Ø80

PFA4000

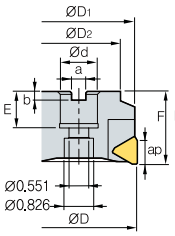


Fig. 1

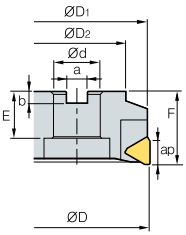


Fig. 2

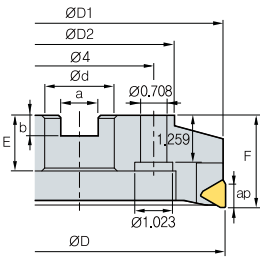


Fig. 3

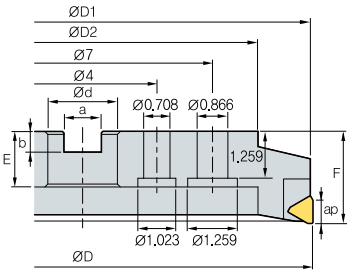


Fig. 4

• AR : 15°
• RR : 14°

(inch)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
PFA	**4300R/L**	4	3	2.96	2.205	1	0.375	0.248	0.866	2.0	0.63	2.6	1
	4400R/L	4	4	3.88	2.874	1 1/4	0.500	0.319	0.866	2.0	0.63	4.0	2
	4500R/L	7	5	4.88	3.389	1 1/4	0.625	0.394	1.181	2.5	0.63	6.8	2
	4600R/L	9	6	5.92	4.882	2	0.750	0.433	1.181	2.5	0.63	12.3	2
	4800R/L	11	8	7.88	5.118	2 1/2	1.000	0.551	1.496	2.5	0.63	19.4	3
	41000R/L	15	10	9.88	7.087	2 1/2	1.000	0.551	1.496	2.5	0.63	35.2	3
	41200R/L	19	12	11.84	9.449	2 1/2	1.000	0.551	1.496	2.5	0.63	48.4	4

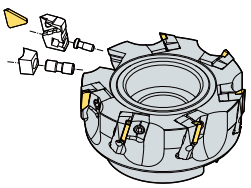
Available Inserts

TFCN

Designation		Cermet		Coated							Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TFCN	**42PFR**													●		E21
	42PFL															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	**NCM325** **PC3600** **ST30A**
M	150~600 150~400	0.002~0.008 0.002~0.008	**PC9530v**
K	500~900 300~600	0.002~0.120 0.002~0.012	**PC6510** **G10**

Assembling	

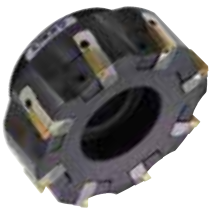
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3 ~ Ø12	LPF4R/L LPF4R1**/L1**	WPFR/L	DHA0821F DHA0817F*	LTX0512	HW40

* : Ø3 ~ Ø4 / ** : Ø3 ~ Ø5

Available Inserts E21

PPNA4000



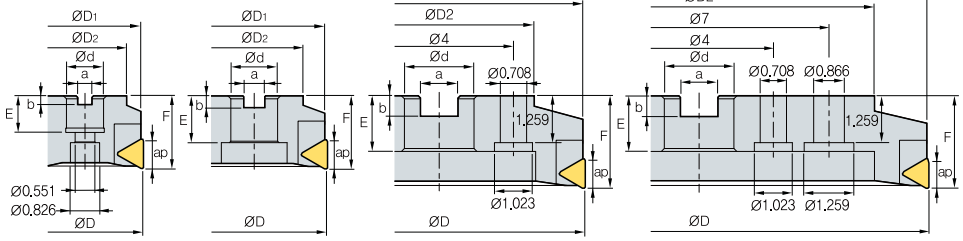


Fig. 1 Fig. 2 Fig. 3 Fig. 4

AA 0°
- AR : 7°
- RR : 0°

(inch)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig
PPNA	4300R/L	5	3	2.96	2.205	1	0.375	0.248	0.866	2.0	0.70	2.9	1
	4400R/L	6	4	3.96	2.874	1 1/4	0.500	0.319	0.866	2.0	0.70	4.2	2
	4500R/L	8	5	4.96	3.389	1 1/4	0.625	0.394	1.181	2.5	0.70	7.7	2
	4600R/L	10	6	5.92	4.882	2	0.750	0.433	1.181	2.5	0.70	12.3	2
	4800R/L	12	8	7.92	5.118	2 1/2	1.000	0.551	1.496	2.5	0.70	17.8	3
	41000R/L	16	10	9.92	7.087	2 1/2	1.000	0.551	1.496	2.5	0.70	29.3	3
	41200R/L	20	12	11.92	9.449	2 1/2	1.000	0.551	1.496	2.5	0.70	47.1	4

Available Inserts


TPCN


TPKN-SU


TPKN-MU

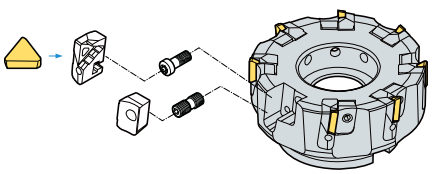

TPKR-MX

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC130	ST30A	G10	H01	
TPCN	43PDR	●		●									●	●	●		E21
	43PDR-G															●	
	43PDL													●			
	43PDSR				●												
	43PDTR																
	43PDR-RH																
	43PDER-RH									●	●						
	43PDSR-RH									●							
	43PDR-S20								●								
TPKN	43PDSR-MU						●										E21
	43PDSR-SU						●	●			●	●					
	43PDSL-SU						●										E21
TPKR	43PDR-MX			●													E21
	43PDSR-MX			●	●												
	43PPR-MX																

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling



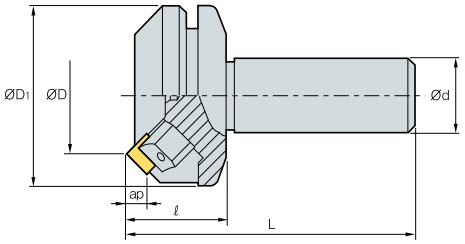
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3 ~ Ø12	LPPN4R/L LPPN4R1*/L1*	WPPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

Available Inserts E21

* : Ø80 ~ Ø100

ADSA4000



AA 45°

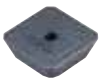
- AR : 15°
- RR : -3°

(inch)

Designation			ØD	ØD1	Ød	ℓ	L	ap	lbs
ADSA	4200R	3	2	2.984	1 1/4	1.575	4.724	0.26	4.0
	4200R-S150	3	2	2.984	1 1/2	1.575	4.724	0.26	4.8
	4250R	4	2 1/2	3.445	1 1/4	1.575	4.724	0.26	5.1
	4250R-S150	4	2 1/2	3.445	1 1/2	1.575	4.724	0.26	5.9

Available Inserts


SDCN


SDKN-MU


SDKN-SU

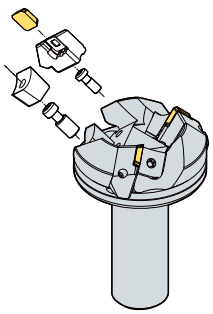

SDKR-MX

Designation		Cermet		Coated						Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M												●			E13
	42M-G														●	
	42MT	●	●		●								●			
	42MT-RH															
	42MT-S20								●							
	42AEEN															
	42AEEN-RH															
	42AESN															
	42AESN-RH															
SDKN	42AESN-MU						●									E14
	42AESN-SU						●				●	●				
SDKR	42AESN-MX															E14
	42AETN-MX															
	42AEN-MX			●												

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3600 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling

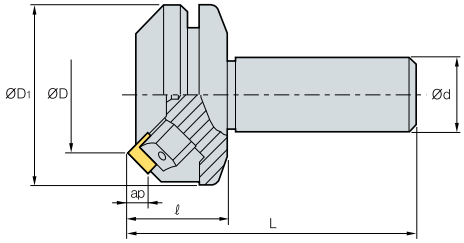


Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø2~Ø2 1/2	LASS4R/L	WASR/L	WTX0817	LTX0512	TW25

Available Inserts E13, E14

ADSA5000



AA 45°

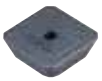
- AR : 15°
- RR : -3°

(inch)

Designation			ØD	ØD1	Ød	ℓ	L	ap	lbs
ADSA	5200R	3	2	2.984	1 1/4	1.575	4.724	0.33	4.2
	5200R-S150	3	2	2.984	1 1/2	1.575	4.724	0.33	5.1
	5250R	4	2 1/2	3.445	1 1/4	1.575	4.724	0.33	5.3
	5250R-S150	4	2 1/2	3.445	1 1/2	1.575	4.724	0.33	6.2

Available Inserts


SDCN


SDKN-MU


SDKN-SU

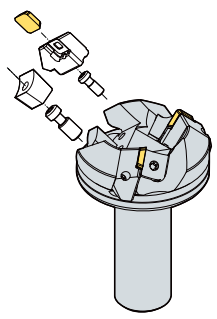

SDKR-MX

Designation		Cermet		Coated							Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M												●			E13
	53M-G														●	
	53MT		●	●									●			
	53MT-RH					●										
	53MT-S20								●							
	53AEEN															
	53AEEN-RH															
	53AESN															
	53AESN-RH															
SDKN	53AESN-MU						●									E14
	53AESN-SU						●				●	●				
SDKR	53AESN-MX				●											E14
	53AETN-MX															
	53AEN-MX			●												

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3500 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530 ST30A
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø2~Ø2 1/2	LASS5R/L	WASR/L	WTX0817	LTX0512	TW25

Available Inserts E13, E14

PESA2000/3000/4000

2000/3000 type 4000 type

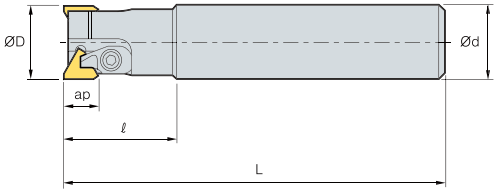


Fig. 1

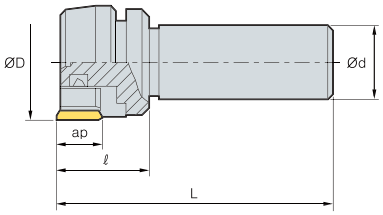
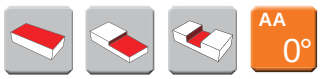


Fig. 2



- AR : 10°~15°
- RR : 2°~-3°

(inch)

Designation		⊚	ØD	Ød	ℓ	L	ap	lbs	Fig
PESA	**2075R**	2	3/4	3/4	1.181	4.331	0.32	0.7	1
	2100R	2	1	1	1.378	4.724	0.32	1.1	1
	3125R	2	1 1/4	1 1/4	1.772	6.299	0.51	2.2	1
	3150R	2	1 1/2	1 1/4	1.772	6.299	0.51	2.9	1
	4200R	3	2	1 1/4	1.575	4.724	0.65	2.6	2
	4200R-S150	3	2	1 1/2	1.575	4.724	0.65	3.3	2
	4250R	4	1 1/2	1 1/4	1.575	4.724	0.65	3.3	2
	4250R-S150	4	1 1/2	1 1/2	1.575	4.724	0.65	4.0	2

Available Inserts

TECN

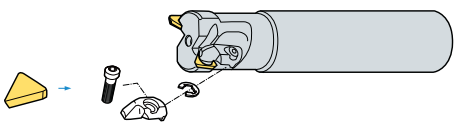
TEEN

Designation			Cermet		Coated								Uncoated			page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	TECN	**22R**															E20
		22TR		●										●			
3000 type	TECN	**32R**													●		E20
		32TR		●		●							●	●			
		32TR-S20								●							
4000 type	TEEN	**43R**													●		E20
		43R-G														●	
		43TR	●	●	●	●					●		●	●			
		43TR-S20								●							
		43TR-Z															
		43TR-ZH					●			●							

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	**NCM325** **PC3500** **ST30A**
M	150~600 150~400	0.002~0.008 0.002~0.008	**PC9530**
K	500~900 300~600	0.002~0.120 0.002~0.012	**PC6510** **G10**

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench	Wrench	Clamp	Ring
Ø3/4~Ø1	-	-	-	CHX0407	HW25L	-	CH4R1	ER03
Ø1 1/4~1 1/2	-	-	-	CHX0510	HW30L	-	CH5R1	ER04
Ø2~Ø2 1/2	LPTS4R/L	WPTSR	DHA0815	LTX0512	-	HW40	-	-

Available Inserts E20

AFOA4000

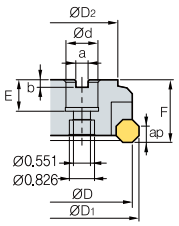


Fig. 1

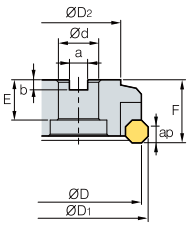


Fig. 2

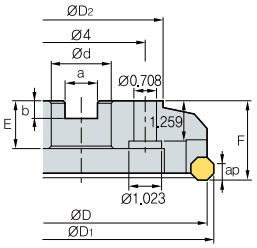


Fig. 3

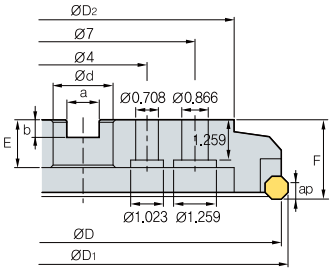


Fig. 4

AA 45°

- AR : 15°
- RR : 5°

(inch)

Designation		○	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig
AFOA	**4300R/L**	5	3	3.31	2.205	1	0.375	0.248	0.866	2.0	0.26	3.1	1
	4400R/L	6	4	4.31	2.874	1 1/4	0.500	0.319	0.866	2.0	0.26	4.4	1
	4500R/L	8	5	5.31	3.389	1 1/2	0.625	0.394	1.181	2.5	0.26	6.8	1

Available Inserts


OFCW


OFKT-MF


OFKT-MM

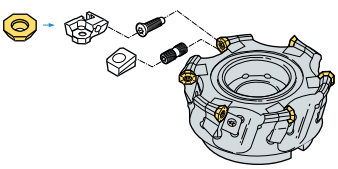

OFKT-MA

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCW	**05T3SN**															E10
	05T3FN															
	05T308FN															
OFKT	**05T3SN-MF**			●	●					●						E10
	05T308SN-MF															
	05T3SN-MM			●	●	●			●							
	05T308SN-MM															
	05T3FN-MA														●	
	05T3EN-MA															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	**NCM325** **PC3500** **ST30A**
M	150~600 150~400	0.002~0.008 0.002~0.008	**PC9530v**
K	500~900 300~600	0.002~0.120 0.002~0.012	**PC6510** **G10**

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Screw	Wrench
Ø3~Ø5	LAF04R/L	WAFO4R/L	DHA0815	FTKA0408	TW15S

Available Inserts **E10**

AFOA5000

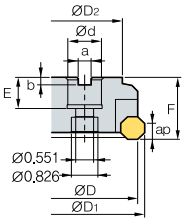


Fig. 1

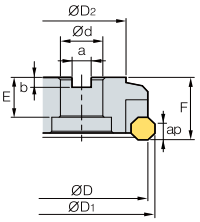


Fig. 2

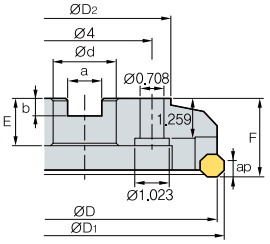


Fig. 3

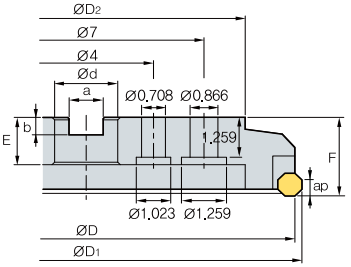


Fig. 4

AA 45°

- AR : 15°
- RR : 5°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AFOA	5300R/L	5	3	3.43	2.205	1	0.375	0.248	0.866	2.0	0.37	3.1	1
	5400R/L	6	4	4.43	2.874	1 1/4	0.500	0.319	0.866	2.0	0.37	4.4	2
	5500R/L	8	5	5.43	3.389	1 1/2	0.625	0.394	1.181	2.5	0.37	6.8	2
	5600R/L	10	6	6.43	4.882	2	0.750	0.433	1.181	2.5	0.37	11.4	2
	5800R/L	12	8	8.43	5.118	2 1/2	1.000	0.551	1.496	2.5	0.37	16.5	3
	51000R/L	16	10	10.43	7.087	2 1/2	1.000	0.551	1.496	2.5	0.37	35.4	3
	51200R/L	20	12	12.43	9.449	2 1/2	1.000	0.551	1.496	2.5	0.37	50.2	4

Available Inserts


OFKT-MM


OFKT-MA


OFCN


OFKR-MF


OFKR-MM

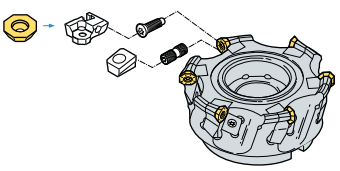

OFKR-MA


REKR-MM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCN	0704SN					●				●						E10
	0704FN															
	070408SN															
	070408FN															
OFKR	0704SN-MF			●	●											
	070408SN-MF			●												
	0704SN-MM			●	●	●		●	●	●						E10
	070408SN-MM			●												E11
	0704FN-MA														●	
	0704EN-MA															
OFKT	0704SN-MM			●												
	0704FN-MA														●	E11
	0704EN-MA															
REKR	170400-MM															E13

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	500~1,000 400~800 300~600	0.002~0.006 0.002~0.008 0.002~0.008	NCM325 PC3500 ST30A
M	150~600 150~400	0.002~0.008 0.002~0.008	PC9530 ST30A
K	500~900 300~600	0.002~0.120 0.002~0.012	PC6510 G10

Assembling	

Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~ Ø12	LAF05R/L LAF05R*/L-1*	WEFR/L	DHA0821F	LTX0512	HW40

* : Ø3 ~ Ø4

Available Inserts E10, E11, E13

New serrated edge design increases productivity by reducing insert cutting load

Power Buster

- New tooling utilizing a specially designed serrated edge to increase productivity by reducing the cutting load.
- Double-sided 6 corner insert geometry ensures high rigidity, long tool life and cost efficiency
- The serrated edge divide the chips into smaller pieces. This feature provides excellent chip control, reduces interference of the cutter and ensures good durability of the cutter body.
- AA (approach angle) : 45° and 10° available (same insert used)
- Application : High depth of cut and feed rate(Steel, Cast iron)

Code system

PB	A	C	A	5	400	R/L	–	M
Power Buster	**AA**	**Cutter type**	**Arbor type**	**Inscreibed circle of insert**	**Tool Dia.**	**Hand**		**No, of tooth**
Power buster	A : 45° Z : 10°	C : Cutter S : Shank	M : Metric A : Inch	5 : 5/8	ØD : 4inch	R : Right L : Left		No code : Coarse pitch M : Close pitch

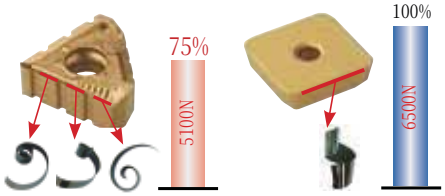
Features of Insert

❶ Major cutting edge(serrated edge)

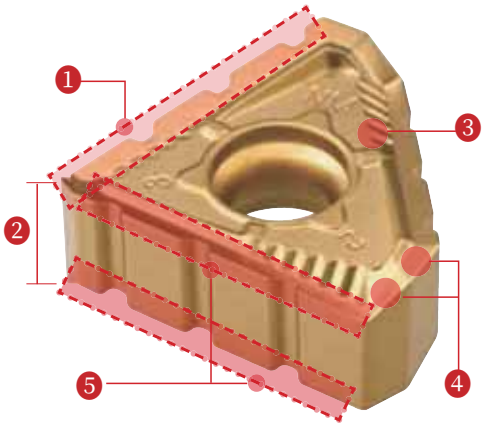
- Low cutting forces
- Ideal for chip control, divides chips into small pieces for proper chip evacuation. Double sided 6 corner insert
- Ideal edge design for Steel and Cast iron rough milling

Comparison of chip control and cutting force

Power Buster	ISO milling insert

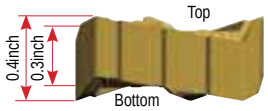


Workpiece : SCM4140
Cutting condition : vc=656sfm
ap=0.32inch
ae=3.54inch
fz=0.012ipt



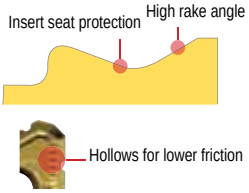
❷ Thicker insert

- Thick insert guarantees high rigidity
- Balanced insert design for stable mounting



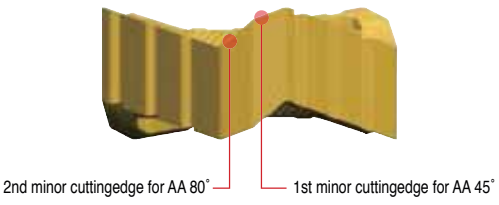
❸ NM Chip breaker

- High rake angle for low cutting force
- Good chip flow at various feed and depth of cut
- Inserts are protected with seats for a precise mounting
- Low friction and good heat evacuation at high depth cut



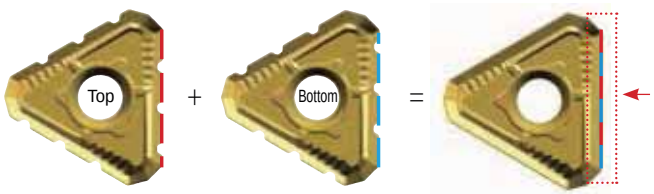
❹ Minor cutting edge

- High rake angle to avoid interference with chip
- Calculated minor cutting edge angel for both AA 45° & 10° cutter



❺ Mirror system

- Cutting edge on the both side of insert covers all overlapped cutting area



Perfected cutting edge by using 2 different side of cutting edge

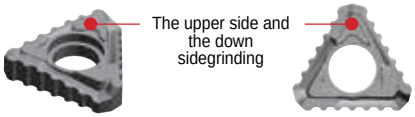
Features of Cutter

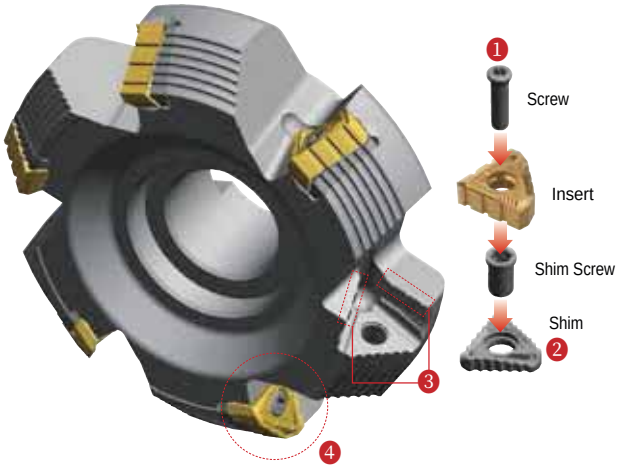
❶ Screw on clamping system

- Simple and strong screw on clamping system

❷ Better rigidity & Stable Assembly system

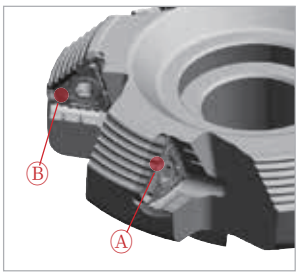
- The shim protects the cutter from insert damage
- High accuracy shim ensures tighter clamping

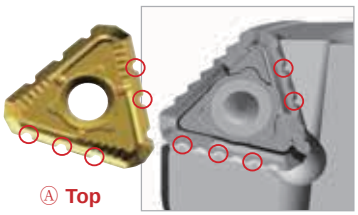


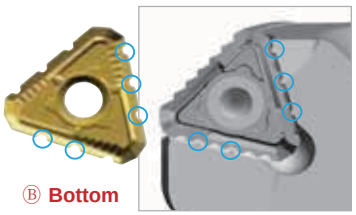


❸ Foolproof System

- Insert serrations match pocket design to prevent improper seating and alignment

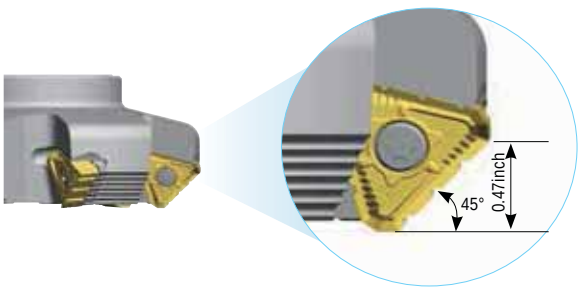


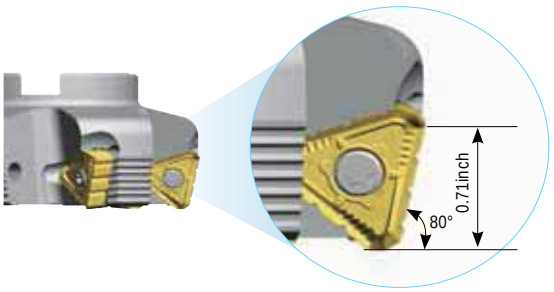




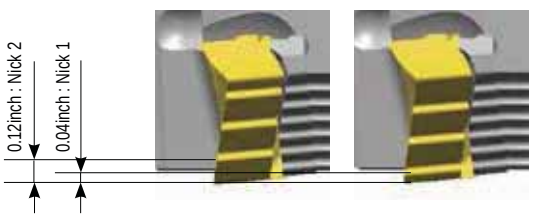
❹ Multi-application system

- Same insert for multi use (45˚and 10˚)

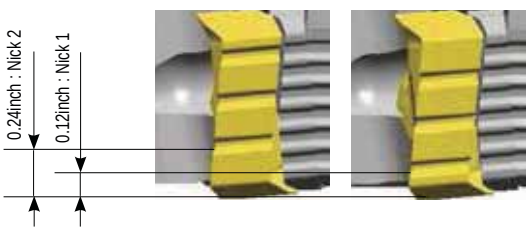




The serrations are effective with a depth of cut larger than 0.004inch

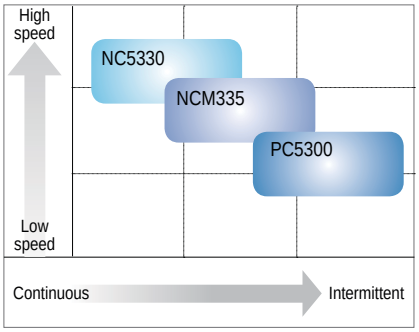


The serrations are effective with a depth of cut larger than 0.12inch



Recommended cutting condition

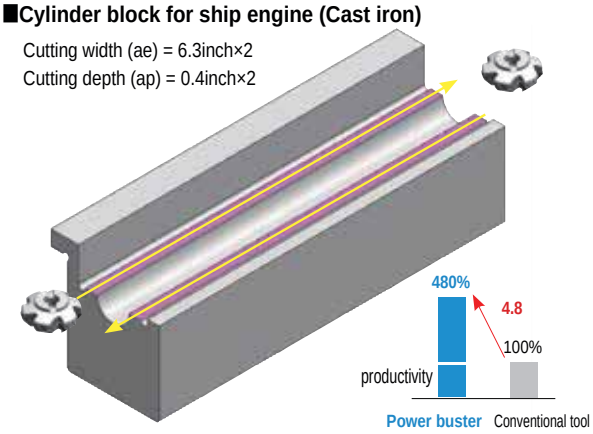
ISO	Workpiece	NC5330	NCM335	PC5300
		fz(ipt)		
		0.004-0.008-0.012	0.004-0.008-0.012	0.004-0.008-0.012
		vc(sfm)		
P	Carbon steel	984-820-656	919-755-591	820-656-525
P	Alloy steel	820-394-591	755-591-492	591-492-394
P	Die steel	591-492-427	525-427-361	459-394-328
K	Gray cast iron	919-722-591	820-656-525	722-591-492
K	Malleable cast iron	820-656-525	755-591-492	591-492-427
K	Nodular cast iron	755-591-492	689-525-427	525-394-328



Power Buster Test

■Cylinder block for ship engine (Cast iron)

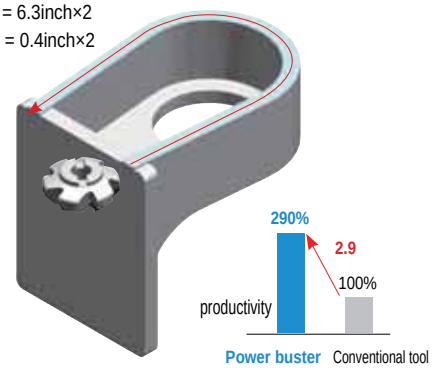
Cutting width (ae) = 6.3inch×2
Cutting depth (ap) = 0.4inch×2



Item	Power Buster	Conventional tool
Diameter(ØD)	8inch	8inch
⦾	12 tooth	12 tooth
Grade	NC9025	PVD coating for Cast iron
vc	558sfm	427sfm
fz	0.009ipt	0.006ipt
ap	0.4inch x 2 passes	0.16inch x 5 passes
min	28.2min/ea	137.5min/ea
4.8 times productivity increased		• One-sided 4 corner insert(Without nick) • AA 45° cutter

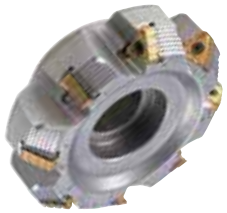
■Heavy machinery part (Alloy steel)

Cutting width (ae) = 6.3inch×2
Cutting depth (ap) = 0.4inch×2



Item	Power Buster	Conventional tool
Diameter(ØD)	5inch	5inch
⦾	8 tooth	8 tooth
Grade	NCM335	PVD coating for Cast iron
vc	591sfm	492sfm
fz	0.006ipt	0.004ipt
ap	0.2inch x 2 passes	0.1inch x 4 passes
min	5min/ea	14.7min/ea
2.9 times productivity increased		• Double-sided 8 corner insert(Without nick) • AA 45° cutter

PBACA5000



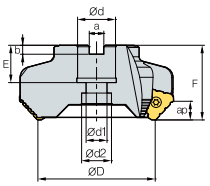


Fig. 1

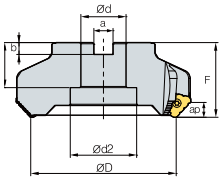


Fig. 2

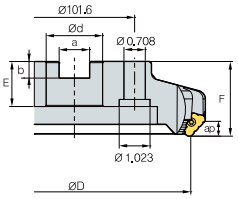


Fig. 3

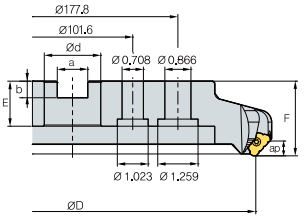


Fig. 4

AA
45°

- AR : -5°
- RR : -11°

(inch)

	Designation		⊚	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	Fig.
Coarse pitch	PBACA	5300R/L	4	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.472	1
		5400R/L	4	4	1.250	-	1.772	0.500	0.319	0.866	2.000	0.472	2
		5500R/L	6	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.472	2
		5600R/L	8	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.472	2
		5800R/L	10	8	2.500	-	-	1.000	0.551	1.496	2.500	0.472	2
		51000R/L	12	10	2.500	-	-	1.000	0.551	1.496	2.500	0.472	3
		51200R/L	14	12	2.500	-	-	1.000	0.551	1.496	2.500	0.472	4
Close pitch	PBACA	5300R/L-M	6	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.472	1
		5400R/L-M	6	4	1.250	-	1.772	0.500	0.319	0.866	2.000	0.472	2
		5500R/L-M	8	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.472	2
		5600R/L-M	10	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.472	2
		5800R/L-M	12	8	2.500	-	-	1.000	0.551	1.496	2.500	0.472	2
		51000R/L-M	14	10	2.500	-	-	1.000	0.551	1.496	2.500	0.472	3
		51200R/L-M	16	12	2.500	-	-	1.000	0.551	1.496	2.500	0.472	4

Available Inserts

TNMX-NM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NC5330	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM			●	●	●			●		●					E21
	2710AZNL-NM															

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3~Ø12	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts E21

PBZCA5000

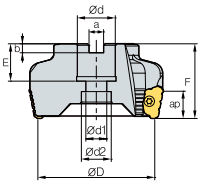


Fig. 1

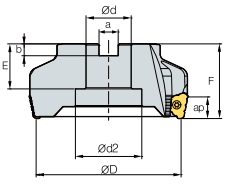


Fig. 2

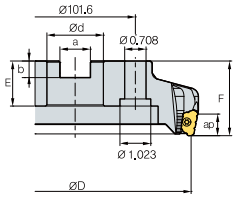


Fig. 3

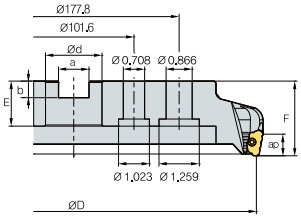


Fig. 4

AA 10°

- AR : -5°
- RR : -12°

(inch)

Designation				ØD	Ød	Ød1	Ød2	a	b	E	F	ap	Fig.
Coarse pitch	PBZCA	5300R/L	4	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.709	1
		5400R/L	4	4	1.250	-	1.772	0.500	0.319	0.866	2.500	0.709	2
		5500R/L	6	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.709	2
		5600R/L	8	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.709	2
		5800R/L	10	8	2.500	-	-	1.000	0.551	1.496	2.500	0.709	2
		51000R/L	12	10	2.500	-	-	1.000	0.551	1.496	2.500	0.709	3
		51200R/L	14	12	2.500	-	-	1.000	0.551	1.496	2.500	0.709	4
Close pitch	PBZCA	5300R/L-M	6	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.709	1
		5400R/L-M	6	4	1.250	-	1.772	0.500	0.319	0.866	2.500	0.709	2
		5500R/L-M	8	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.709	2
		5600R/L-M	10	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.709	2
		5800R/L-M	12	8	2.500	-	-	1.000	0.551	1.496	2.500	0.709	2
		51000R/L-M	14	10	2.500	-	-	1.000	0.551	1.496	2.500	0.709	3
		51200R/L-M	16	12	2.500	-	-	1.000	0.551	1.496	2.500	0.709	4

Available Inserts

TNMX-NM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NC5330	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM			●	●	●			●		●					E21
	2710AZNL-NM															

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3~Ø12	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts E21

Rich Mill series is one of innovations that provides more available cutting edges by double sided insert and longer tool life for our customers

Rich Mill Series

- Rich Mill series is one of the innovations that provides more available cutting edges with double sided inserts and longer tool life for our customers
- The unique geometry and special cutting edge guarantees low cutting loads and long tool life
- Rich Mill series has a wide application range from steel and stainless steel to cast iron and aluminum
- Applying negative inserts makes it even stronger and provides longer tool life
- Rich Mill series has both screw on clamping system and latch clamping system

Rich Mill Clamping bolt

Socket bolt
(Ø2~Ø5 - Hexagonal socket bolt)

Mounting bolt
(Ø6~Ø10 - Mounting bolt for general face milling)

Rich Mill Series

E 66~67

E 68~69

E 70~71

E 72~75

E 76~79

E 80~81

E 82

E 83

E 84

E 84

E 85~88

E 89~92

E 93~94

E 95~96

E 97~98

E 99

E 100~101

Code system

RM8 A C A 4 400 H R – M

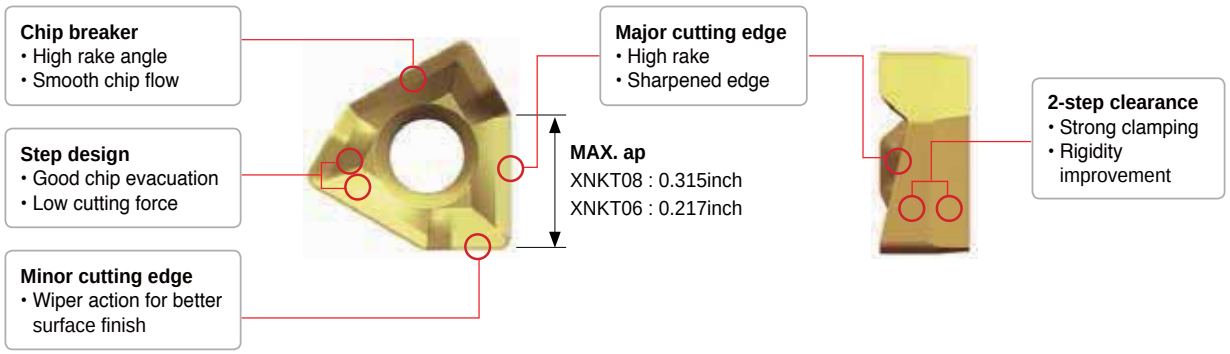
Number of edges	Approach angle	Tool type	Arbors type	Inscreibed circle of insert	Tool Dia.	Coolant type	Hand	Pitch type
RM3 : Number of edges-3 RM4 : Number of edges-4 RM8 : Number of edges-8 RMH8 : Number of edges-8 (Shim) RMT8 : Number of edges-8 (Latch Clamp) RM16 : Number of edges-16	A : 45˚ D : 30˚ E : 15˚ F : 5˚ P : 0˚ Q : 2˚	C: Cutter S: Shank	M : Metric A : Inch	3 : 3/8 4 : 4/8 5 : 5/8	400 : Ø4	H : Thru-Hole No code : None	R : Right L : Left	M : Close H : Extra Close

Rich Mill RM3

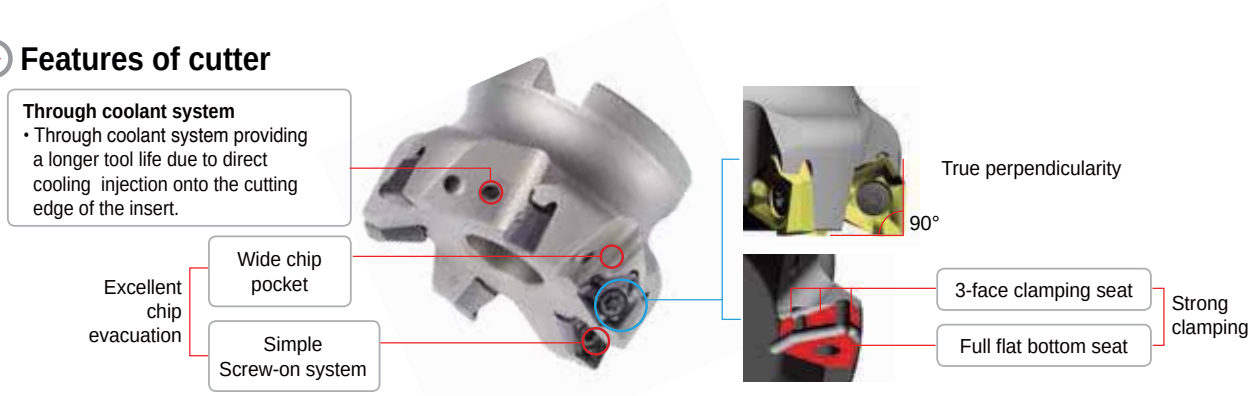
Features

- **High Quality** - True 90° shouldering operation
- **High Productivity** - Strong thick insert and 3-face clamping ensures stable machining even in tough cutting conditions
- **High Economics** - Longer tool life due to optimized cutter and insert geometry

Features of insert

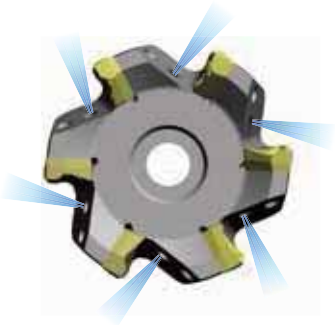


Features of cutter



Through coolant system

- Exclusive through coolant bolt and supporting arbor required
- Effective coolant distribution directly onto the cutting edges



Chip Breaker Features

Chip breaker	Insert	Cutting edge	Applications	Features
MA			Aluminum	■ MA : Milling Aluminum ■ Sharp cutting edge and buffed top face for an excellent chip flow and welding resistance in aluminum machining
ML			Light	■ ML : Milling Light ■ Sharp cutting edge for hard-to-cut materials ■ Low cutting force
MM			General	■ MM : General shouldering operations ■ 1st recommendation

Application guideline for grade

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Nonferrous
Chip breaker	First choice	MM	MM	ML	ML	MA
	Second choice	ML	ML	-	MM	-
Grade	High speed machining	PC3600	PC3600	PC5300	PC6510	H01
	General machining	PC5400	PC5300	PC5400	PC5300	
	Interrupted machining	PC5400	PC5400	PC5400	PC5400	

Recommended cutting condition

RM3 3000 type

Workpiece		Grade	Cutting conditions				Cutting conditions			
			vc (sfm)	fz (ipt)	max ap(inch)	Available inserts	vc (sfm)	fz (ipt)	max ap(inch)	Available inserts
P	steel	PC3600	524~885	0.010~0.002	0.217	XNKT060405 PNSR-MM	160~270	0.2~0.05	5.5	XNKT060405 PNER-ML
		PNSR-MM	524~885	0.008~0.002	0.217		XNKT060405	0.25~0.05	5.5	
		PNER-ML	130~210	0.25~0.05	5.5		130~210	0.25~0.05	5.5	
M	Stainless steel	PC5300	492~787	0.010~0.002	0.217		492~787	0.010~0.002	0.217	
		PC5400	426~688	0.010~0.002	0.217		426~688	0.010~0.002	0.217	
K	Cast iron	PC6510	459~754	0.012~0.003	0.217		459~754	0.010~0.003	0.217	
		PC5300	393~656	0.012~0.003	0.217		393~656	0.010~0.003	0.217	

• Maximum cutting condition : vc = 350m/min, fz = 0.5mm/t according to cutting environment

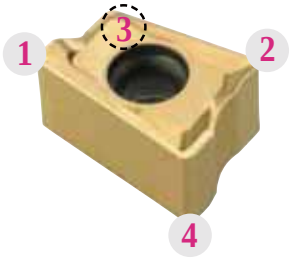
RM3 4000 type

Workpiece		Grade	Cutting conditions				Cutting conditions			
			vc (sfm)	fz (ipt)	max ap(inch)	Available inserts	vc (sfm)	fz (ipt)	max ap(inch)	Available inserts
P	steel	PC3600	524~885	0.012~0.002	0.315	XNKT080508 PNSR-MM	524~885	0.010~0.002	0.315	XNKT080508 PNER-ML
		PC5300	492~787	0.012~0.002	0.315		492~787	0.010~0.002	0.315	
		PC5400	426~688	0.012~0.002	0.315		426~688	0.010~0.002	0.315	
M	Stainless steel	PC5300	295~492	0.010~0.002	0.315		295~492	0.008~0.002	0.315	
		PC5400	229~393	0.010~0.002	0.315		229~393	0.008~0.002	0.315	
K	Cast iron	PC6510	459~754	0.014~0.003	0.315		459~754	0.012~0.003	0.315	
		PC5300	393~656	0.014~0.003	0.315		393~656	0.012~0.003	0.315	
N	Aluminum	H01	1312~3937	0.016~0.004	0.315	XNCT080508 PNFR-MA	-	-	-	

• Maximum cutting condition : vc = 350m/min, fz = 0.7mm/t according to cutting environment

Rich Mill RM4

Economical 4 cutting edges by using double-sided insert



- RM4, as a multi functional milling tool, offers economical 4 cutting edges by using an innovative double-sided insert
- Special designed chip breaker consists of high rake angle and strong cutting edge to decrease the cutting load
- RM4 is multi functional tool that can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert

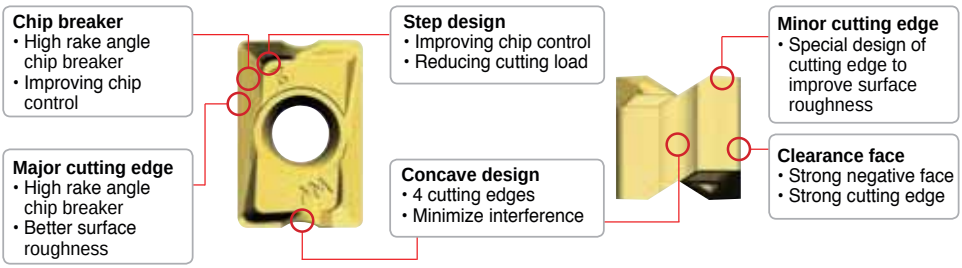
Features

- 4 cutting edges can be used by using double-sided insert
- High rake angle chip breaker and cutting edge can make smooth cutting with low cutting load
- Strong negative insert
- High efficiency, economical, multi functional tool

- Through coolant system Longer tool life due to direct cooling injection into the cutting edge of insert
- Wide chip pocket for better chip evacuation
- Simple screw on system

Inserts

- Double-sided insert using 4cutting edges
- High rake angle chip breaker, cutting edge
- Flexibility of product
- High efficiency, economical, multi functional tool
- Negative insert has strong cutting edge

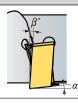


Uses

Chip breaker

Insert		Cutting edge	Features
Aluminum, Light machining **MA**			With sharp edge application the better productivity has been accomplished, especially for Aluminum or low force cut
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material.
General cutting **MM**			It is suitable design for general milling.

Setting configuration

Insert	Setting angle of insert	Features
		High rake chip breaker & positive setting angle for low cutting load - Improving machinability
		Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc

Through coolant system

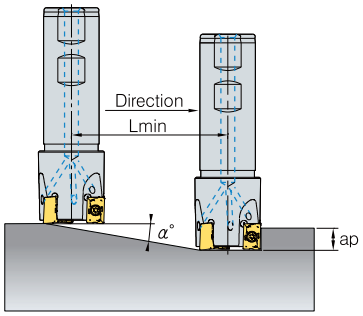
- By using on exclusive coolant bolt(hexagonal socket bolt) powerful cooling & better chip evacuation can be acquired. To get optimal chip control, the direction of coolant injection has been designed to reach to each cutting edge directly. (through coolant arbor is required.)

Through coolant system for decreasing cutting heat and good chip evacuation

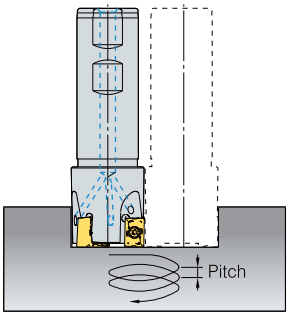
Rich Mill RM4

Ramping and Helical cutting

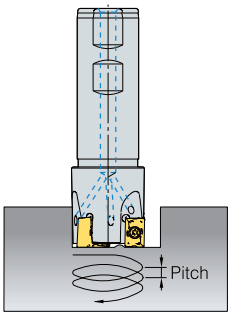
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



Designation	1. Ramping			2. Helical cutting for blind hole				3.Helical cutting for through hole	
	D	α°	Lmin	Maximum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Minimum Pitch
3056HR	0.562	5.0	4.503	1.069	0.13	0.990	0.11	0.785	0.06
3062HR	0.625	4.0	5.634	1.195	0.12	1.116	0.10	0.911	0.06
3068HR	0.688	4.0	5.634	1.321	0.13	1.242	0.12	1.037	0.07
3075HR	0.750	4.0	5.634	1.445	0.15	1.366	0.13	1.161	0.09
3100HR	1.000	3.5	6.442	1.945	0.18	1.866	0.16	1.661	0.12
3125HR	1.250	3.0	7.518	2.445	0.19	2.366	0.18	2.161	0.15
3150HR	1.500	2.0	11.283	2.945	0.15	2.866	0.14	2.661	0.12
3200HR	2.000	1.5	15.046	3.945	0.15	3.866	0.14	3.661	0.13
3150HR	1.500	2.0	11.283	2.945	0.15	2.866	0.14	2.661	0.12
3200HR	2.000	1.5	15.046	3.945	0.15	3.866	0.14	3.661	0.13
3250HR	2.500	1.0	22.572	4.945	0.13	4.866	0.12	4.661	0.11
3300HR	3.000	1.0	22.572	5.945	0.15	5.866	0.14	5.661	0.14
3400HR	4.000	0.5	45.148	7.945	0.10	7.866	0.10	7.661	0.10
4125HR	1.250	2.5	9.024	2.445	0.16	2.366	0.15	2.161	0.12
4150HR	1.500	2.0	11.283	2.945	0.15	2.866	0.14	2.661	0.12
4200HR	2.000	2.0	11.283	3.945	0.20	3.866	0.19	3.661	0.18
4250HR	2.500	2.0	11.283	4.945	0.25	4.866	0.24	4.661	0.23
4200HR	2.000	2.0	11.283	3.945	0.20	3.866	0.19	3.661	0.18
4250HR	2.500	2.0	11.283	4.945	0.25	4.866	0.24	4.661	0.23
4300HR	3.000	1.5	15.046	5.945	0.23	5.866	0.22	5.661	0.21
4400HR	4.000	1.0	22.572	7.945	0.20	7.866	0.19	7.661	0.20
4500HR	5.000	1.0	22.572	9.945	0.26	9.866	0.25	9.661	0.25
4600R	6.000	0.5	45.148	11.945	0.15	11.866	0.15	11.661	0.15

The Lmin is when depth of cut is 0.394inch (Lmin = 10/tan α)

Recommended cutting condition

(inch)

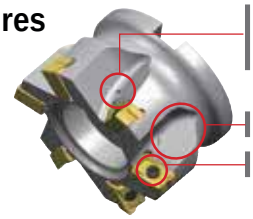
ISO	Grade	LNM(E)X100605PNR-MF		LNM(E)X100605PNR-MM		LNEX100605PNR-MA		Max-ap	LNM(E)X151008PNR-MF		LNM(E)X151008PNR-MM		LNEX151008PNR-MA		Max-ap
		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	
P	NCM325	-	-	-	-	-	-	0.354 inch	490~985	0.002~0.01	390~985	0.002~0.012	490~985	0.001~0.008	0.551 inch
P	PC3500	490~985	0.002~0.010	390~985	0.002~0.012	490~985	0.001~0.008		490~985	0.002~0.01	390~985	0.002~0.012	490~985	0.001~0.008	
M	PC5300	390~590	0.002~0.010	330~590	0.002~0.012	390~655	0.001~0.008		390~590	0.002~0.01	330~590	0.002~0.012	390~665	0.001~0.008	
K	PC6510	490~985	0.003~0.012	390~985	0.003~0.014	-	-		490~985	0.003~0.012	390~985	0.003~0.014	-	-	

Rich Mill RM4Z

Plunge Mill RM4Z

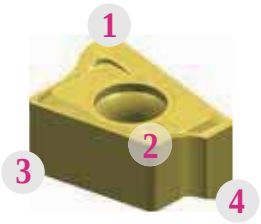
- ▶ Rich mill series RM4Z is a plunge mill for high ef ficiency vertical machining such as slotting and pocketing in roughing applications.
- ▶ Rich mill series RM4Z is a high ly efficient milling tool for plunging, shouldering and facing. It makes operations more economical with the use of its double-sided 4-corner insert
- ▶ Plunge machining reduces lead time for high productivity and precision machining.
- ▶ In plunging the max depth of RM4Z 3000 type is 0.354inch and that of RM4Z 4000 type is 0.551inch

Features



Through coolant system
Improving chip control
Cooling inserts increases tool life

Wide chip pocket
Screw on system
Improving chip evacuation

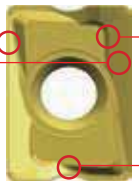


- Double sided insert ···› 4 corner available
- High rake angle chip breaker and cutting edge
- Various available machining types
- High efficiency and economical insert
- Negative type insert - Strong cutting edge

Inserts

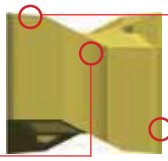
Major cutting edge
- High rake cutting edge
- Sharp cutting edge

Chip breaker
- High rake angle
- Control chip flow



Step design
- Improving chip control
- Reducing cutting load

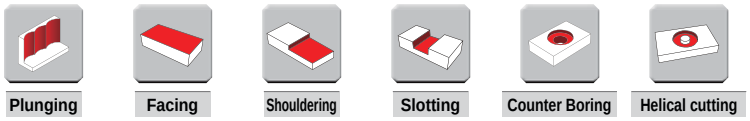
Concave design
- 4 corner available
- Avoiding interference of cutting edges



Minor cutting edge
- Special design for plunge machining

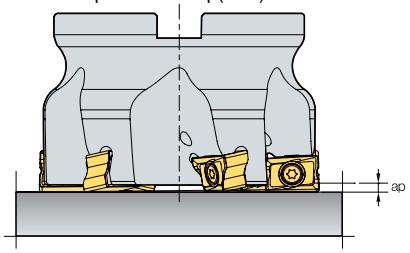
Sides
- Negative type
- Strong cutting edge

Uses

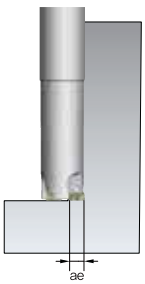


The depth of cut by machining type

- In horizontal machining, Depth of cut = ap(inch)

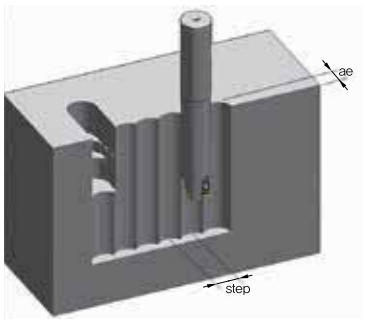


- In plunging, Depth of cut = ae(inch)



RM4Z	Horizontality	Verticality	
	max ap(inch)	max ae(inch)	step
RM4Z 3000	0.059	0.354	< 0.7D
RM4Z 4000	0.098	0.551	< 0.7D

Max Step in plunging



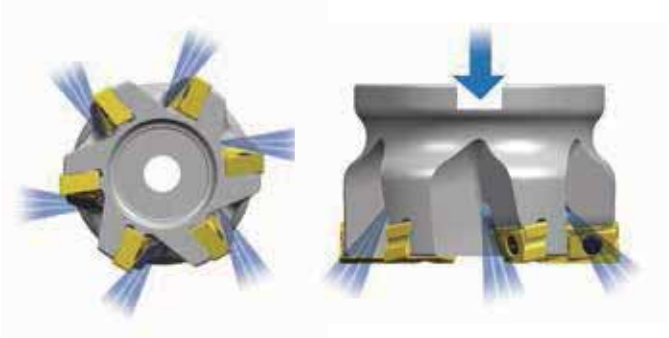
ae	Cutter Diameter(inch)						
	1.00	1.25	1.50	2.00	2.50	3.00	4.00
	max step (inch)						
0.039	0.386	0.433	0.476	0.555	0.622	0.681	0.787
0.079	0.535	0.606	0.783	0.776	0.870	0.957	1.110
0.118	0.642	0.728	0.807	0.941	1.059	1.165	1.350
0.157	0.724	0.827	0.917	1.075	1.215	1.335	1.555
0.197	0.791	0.909	1.012	1.189	1.346	1.484	1.728
0.236	0.846	0.976	1.091	1.287	1.461	1.614	1.882
0.276	0.890	1.035	1.161	1.378	1.563	1.732	2.024
0.315	0.925	1.083	1.220	1.457	1.657	1.839	2.154
0.354	0.953	1.126	1.272	1.524	1.740	1.933	2.272
0.394	-	-	-	-	1.819	2.024	2.382
0.433	-	-	-	-	1.890	2.106	2.484
0.472	-	-	-	-	0.776	2.185	2.579
0.512	-	-	-	-	2.016	2.256	2.669
0.551	-	-	-	-	2.071	2.323	2.756

Rich Mill RM4Z

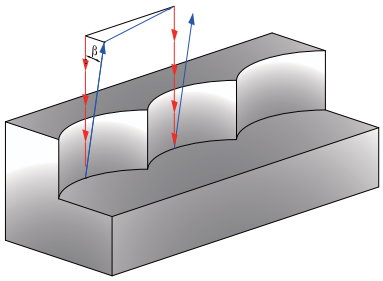
Through coolant system

- Exclusive hexagonal coolant socket bolt provides excellent cooling and chip evacuation.
- Direct coolant injection to cutting edge improves cooling effectiveness
- Coolant type arbor should be used.

* Coolant bolt is not included, it is for sale



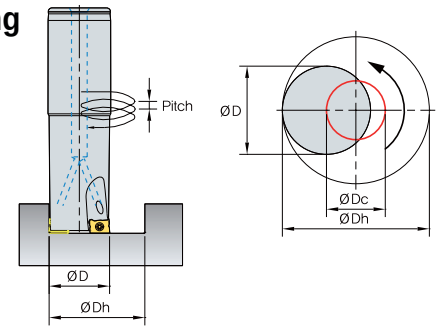
Programming tip



Plunging feed direction
Tool escape
β Escape angle (β ≥ 1°)

▶ When your tool steps back after plunging, please get over 1° more escape angle.

Helical machining



ØDc = ØDh-ØD

ØDc = Tool center path
ØDh = Desired hole diameter
ØD = Tool Dia.

Designation		Diameter ØD(inch)	Helical data			
			ØDh max(inch)	Max. Pitch(inch)	ØDh min(inch)	Max. Pitch(inch)
RM4ZSA	**3100HR-L100**	1.00	1.921	0.075	1.213	0.017
	3125HR-L125	1.25	2.421	0.038	1.674	0.013
	3150HR-L125	1.50	2.921	0.023	2.174	0.011
RM4ZCA	**3150HR**	1.50	2.921	0.023	2.174	0.011
	3200HR	2.00	3.921	0.021	3.174	0.012
RM4ZMA	**3100HR-M12**	1.00	1.921	0.075	1.213	0.017
	3125HR-M16	1.25	2.421	0.038	1.674	0.013
	3150HR-M16	1.50	2.921	0.023	2.174	0.011
RM4ZCA	**4250HR**	2.50	4.921	0.039	3.780	0.021
	4300HR	3.00	5.921	0.032	4.780	0.019
	4400HR	4.00	7.921	0.021	6.780	0.015

Recommended cutting condition

(inch)

ISO	Grade	LNM(E)X100605PNL-MM				LNM(E)X151008PNL-MM			
		vc(sfm)	fz(mm/t)	* max ae(inch)	** max ap(inch)	vc(sfm)	fz(mm/t)	* max ae(inch)	** max ap(inch)
P	**PC3500**	350~820	0.002~0.010	0.354	0.059	400~820	0.002~0.010	0.551	0.098
M	**PC5300**	270~600	0.002~0.008			330~600	0.002~0.008		
K	**PC6510**	350~820	0.003~0.012			400~820	0.003~0.012		

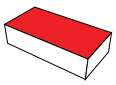
* max ae(inch) : (Plunging) max. radial depth of cut

** max ap(inch) : (Shouldering / Facing) max depth of cut

Rich Mill RM8

Double sided insert to use 8 cutting edges

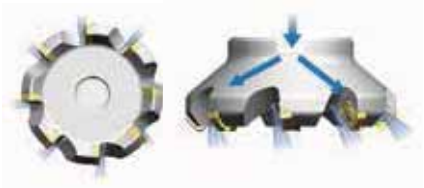
- Innovative double sided insert makes it possible to use 8 cutting edges. It is more economical than conventional single sided insert
- The unique geometry and high rake angle of cutting edge guarantees excellent surface finish. Applicable for various workpieces like steel, stainless steel, cast iron, aluminum
- Combined with the innovative geometry and various grades provided the tool offfers durability and excellent tool life
- Various pitches and chip breakers can be applicable for diverse machining.
- Light Rich mill cutter can be useful for high speed machining and low power machine



Facing

Through coolant system

- Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling. To get optimal chip evacuation, the direction of coolant injection has been designed to reach to each cutting edge directly. Through coolant arbor is required.



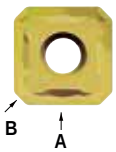
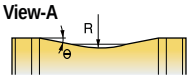
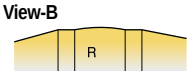
Through coolant system for decreasing cutting heat and good chip evacuation

Chip breaker

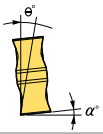
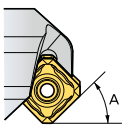
Insert		Cutting edge	Features
For aluminum **MA**			Due to sharp cutting edge and buffed surface, it has good chip flow and welding resistance
Hard-to-cut material **ML**			Chip breaker with low cutting load is optimal for machining hard-to-cut materials.
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material

Insert		Cutting edge	Features
General cutting **MM**			It is suitable design for general milling
Wiper **W**			Specialized edge design can be suitable for excellent surface roughness operation

Features of insert

Insert	Cutting edge	Features
	View-A 	High rake chip breaker & positive setting angle for low cutting load
	View-B 	Designed wiper technology in minor cutting edge for improved surface roughness
	Chip breaker 	Low cutting load due to the positive setting and high rake angle chip breaker

Features of cutter

Shape	Cutting edge	Features
		High rake angle makes positive setting angle for low cutting load
		Suitable for facing and chamfering • RM8A A=45° • RM8E A=15° • RM8Q A=2°

Recommended cutting condition

(inch)

ISO	Grade	SNM(E)X1206A(E)NN-MF		SNM(E)X1206A(E)NN-MM		SNEX1206A(E)NN-MA		Max-ap	SNM(E)X1507A(E)NN-MF		SNM(E)X1507A(E)NN-MM		Max-ap
		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	
P	NC5330	-	-	490~985	0.004~0.014	-	-	RM8A 0.236 RM8E 0.354 RM8Q 0.453	-	-	490~985	0.004~0.014	RM8A 0.295 RM8E 0.433
P	NCM325	655~985	0.002~0.012	490~985	0.004~0.014	655~1150	0.001~0.010		655~985	0.002~0.012	490~985	0.004~0.014	
P	PC3500	655~985	0.002~0.012	490~985	0.004~0.014	655~1150	0.001~0.010		655~985	0.002~0.012	490~985	0.004~0.014	
M	PC6510	490~985	0.003~0.014	490~985	0.004~0.0146	-	-		490~985	0.003~0.014	490~985	0.004~0.0146	
M	PC5300	490~985	0.003~0.014	490~985	0.004~0.016	-	-		490~985	0.003~0.014	490~985	0.004~0.016	
K	PC9530	330~590	0.002~0.002	390~590	0.004~0.014	390~955	0.001~0.008		-	-	-	-	
K	PC5300	-	-	-	-	-	-		330~590	0.002~0.002	390~590	0.004~0.014	

Rich Mill RMH8

Screw on clamping system

▶ Adopt and stable clamping system

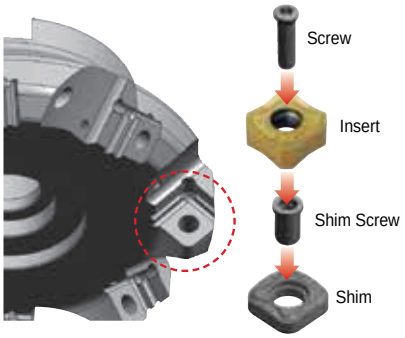
Reinforced rigidity and enhanced clamping power

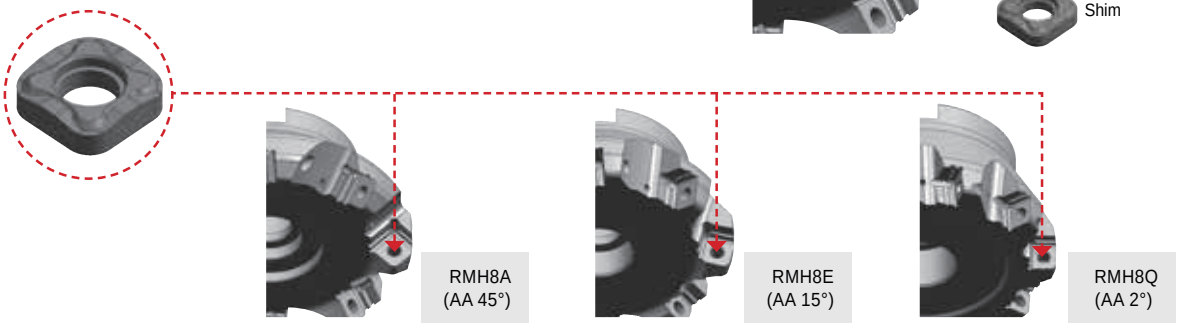
▶ Appling shim system, prevent cutter damage when insert breaks

Adopting exchangeable shim

▶ Using various kinds of cutter (Approach angle 45°, 15°, 2°)

▶ Stable clamping power with insert





Rich Mill RMT8

New generation clamping system

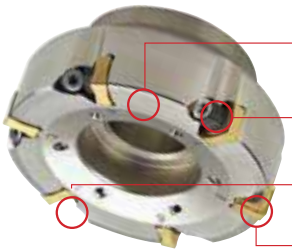
▶ New latch clamping system provides a powerful cutting force and an easy insert change

▶ New grades with chipping resistance provides good surface roughness and better tool life

▶ Due to the specially designed chip breaker, all operations are possible

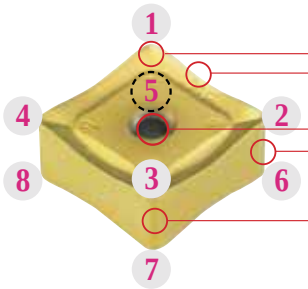
▶ RMT with various pitches can replace conventional ISO milling tool

Features of RMT



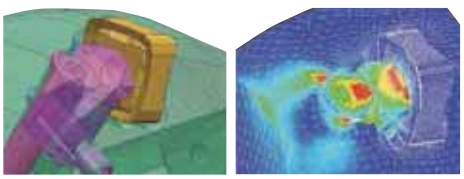
- High rigid cutter body to improve durability
- New latch clamping system ensures the powerful cutting force and easy to insert change
- The 3-dimensional chip pocket design for smooth chip control
- Economical 8 corners with a double-sided insert

Features of RMT insert(using R/L)



- Economical 8 corners
- Low cutting load due to high rake angle chip breaker
- The chamber shape for stable clamping
- Coated grades with improved chipping resistance
- Optimal design of minor cutting edge to use in R/L cutting type good surface roughness

Clamping force analysis



Clamping force analysis

Insert		Cutting edge	Features
Fine finishing MF			Our specialized insert design creates low cutting forces suitable for light cutting, HRSA
Strengthen MM			Suitable geometry design for general milling has wider ranges of machining

Recommended grades and chip breakers

ISO	Grade	MM	MF
P	NCM325		○
P	PC3500		○
P	PC3545		○
M	PC9530		◎
K	PC6510		◎

◎ : Optimum ○ : Proper

Recommended cutting condition

(inch)

ISO	Grade	MM		MF	
		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)
P	NCM325	500~990	0.002~0.012	500~990	0.002~0.008
P	PC3500	500~990	0.002~0.012	500~990	0.002~0.008
P	PC3545	500~990	0.002~0.012	500~990	0.002~0.008
M	PC9530	500~990	0.002~0.012	500~990	0.002~0.008
K	PC6510	400~590	0.002~0.008	400~590	0.002~0.008

Rich Mill RM16

Features

- Economical 16 cutting edges
- Reduces cost in medium cutting
- Wiper insert can be used for good surface roughness
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool
- When it is used 16 corners, maximum cutting depth is 0.22inch, but it is used 8 corners, maximum cutting depth is 0.51inch
- Wiper insert is placed 0.002inch lower than facing insert in cutter
- When feed is bigger than wiper cutting edge length(0.28inch), 2 wiper inserts are placed in symmetrical position

Chip breaker

Insert		Cutting edge	Features
Aluminum Cutting light **MA**			With sharp edge application, the better productivity has been accomplished, especially for Aluminum cutting.
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material.
Hard-to-cut material **ML**			Chip breaker with low cutting load is optimal for machining hard-to-cut materials.
General cutting **MM**			It is suitable design for general milling.
Wiper **W**			It has better surface roughness than MM and MF chip breakers.

Instruction for wiper insert

Hand	Correct setting	Incorrect setting			
Right hand					
Decision	○	×	×	×	×
Left hand					
Decision	○	×	×	×	×

Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation

Recommended cutting condition

(inch)

ISO	Grade	ONM(H)X060608-MM		ONM(H)X060608-MF		ONHX060608-W		ONM(H)X080608-MM		ONM(H)X080608-MF		ONHX080608-W	
		vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)	vc(sfm)	fz (ipt)
P	NCM325	500 ~ 990	0.004 ~ 0.014	660 ~ 990	0.002 ~ 0.012	660 ~ 990	0.002 ~ 0.008	500 ~ 990	0.004 ~ 0.016	660 ~ 990	0.002 ~ 0.014	660 ~ 990	0.002 ~ 0.010
	PC3500	500 ~ 990	0.004 ~ 0.014	660 ~ 990	0.002 ~ 0.012	660 ~ 990	0.002 ~ 0.008	500 ~ 990	0.004 ~ 0.016	660 ~ 990	0.002 ~ 0.014	660 ~ 990	0.002 ~ 0.010
M	PC9530	400 ~ 590	0.004 ~ 0.014	330 ~ 590	0.002 ~ 0.012	330 ~ 590	0.002 ~ 0.008	400 ~ 590	0.004 ~ 0.016	330 ~ 590	0.002 ~ 0.014	330 ~ 590	0.002 ~ 0.010
K	PC6510	500 ~ 990	0.004 ~ 0.016	500 ~ 990	0.003 ~ 0.014	500 ~ 990	0.002 ~ 0.010	500 ~ 990	0.004 ~ 0.018	500 ~ 990	0.003 ~ 0.016	500 ~ 990	0.002 ~ 0.012

Cutters

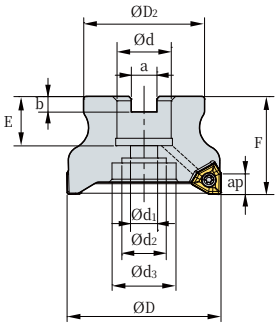
	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM3	0°	RM3PCA3000 New		Ø1.5~Ø3	XNKT060405PNER-ML	XNKT060405PNSR-MM		• Economical 3 corners. • Perfect perpendicularity • Longer tool life due to direct injection into the cutting edge of insert	E66
		RM3PCA4000 New		Ø1.5~Ø5	XNCT080508PNFR-MA XNKT080508PNER-ML XNKT080508PNSR-MM	XNKT080512PNSR-MM XNKT080516PNSR-MM XNKT080520PNSR-MM			E67
RM4	0°	RM4PCA3000		Ø1.5~Ø4	LNEX100605PNR-MF LNMX100605aPNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E70
		RM4PCA4000		Ø2~Ø6	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM			E71
		RM4ZCA3000 New		Ø1.5~Ø2	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E83
		RM4ZCA4000 New		Ø2.5~Ø4	LNEX151008PNL-MM	LNMX151008PNL-MM			
RM8	45°	RM8ACA4000		Ø2~Ø15	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-ML SNEX1206ANN-MM SNMX1206ANN-MM	SNEX1206ANN-W SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML SNEX1507ANN-MM SNMX1507ANN-MM		• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E85
		RM8ACA5000		Ø3~Ø15					E87
	15°	RM8ECA4000		Ø2~Ø8	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM			E89
		RM8ECA5000		Ø3~Ø12	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E91
	2°	RM8QCA4000		Ø2.5~Ø8	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E93
	45°	RMH8ACA4000 New		Ø3~Ø15	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-ML	SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-W			E86
		RMH8ACA5000 New			SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML	SNEX1507ANN-MM SNMX1507ANN-MM			E88
	15°	RMH8ECA4000 New		Ø3~Ø15	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM			E90
		RMH8ECA5000 New			SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E92
	2°	RMH8QCA4000 New		Ø3~Ø8	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E94

	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM8	45°	RMT8AA4000 RMT8AA5000		Ø3~Ø12	SNCF1206ANN-MF / MM SNCF1507ANN-MF / MM	SNMF1206ANN-MF / MM SNMF1507ANN-MF / MM		• Economical 8 corners. • Excellent tool life and surface toughness due to low cutting resistance and high rake edge geometry. • Good performance with increased chipping resistance and grade	E95 E96
	15°	RMT8EA4000 RMT8EA5000			SNCF1206ENN-MF / MM SNCF1507ENN-MF / MM	SNMF1206ENN-MF / MM SNMF1507ENN-MF / MM			E97 E98
	2°	RMT8QA4000			SNCF1206QNN-MF	SNMF1206QNN-MF			E99
RM16	45°	RM16ACA 6000/8000		Ø2.5~Ø8	ONHX060608-MF / ML / MM ONMX060608-MF / MM ONHX0606ANN-MF / MM ONMX0606ANN-MF / MM ONHX080608-MF / ML / MM ONMX080608-MF / MM	ONHX0806ANN-MF / MM ONMX0806ANN-MF / MM ONHX060608-MA ONHX060608-W ONHX080608-MA ONHX080608-W		• Economical 16 corners. • Wiper insert for surface roughness.	E100 E101

Shanks / Modulars

	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM3	0°	RM3PSA3000 New		Ø0.75~Ø1.5	XNKT060405PNER-ML	XNKT060405PNSR-MM		• Economical 3 corners. • Perfect perpendicular shouldering operation multi milling tool	E68
		RM3PSA4000 New		Ø1.25~Ø2.5	XNKT080508PNER-ML XNKT080508PNSR-MM	XNKT080512PNSR-MM XNKT080516PNSR-MM XNCT080520PNSR-MM			E69
RM4	0°	RM4PSA3000		Ø0.562~Ø2	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E80
		RM4PSA4000		Ø1.25~Ø2.5	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM			E81
		RM4ZSA3000		Ø1~Ø1.5	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E84
		RM4PMA3000		Ø0.562~Ø2	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E82
		RM4ZMA3000		Ø1~Ø1.5	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E84

RM3PCA3000 New



AA 0°

• AR : -5°
• RR : -10°~-6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
RM3PCA	**3150HR**	5	1.50	1.417	0.50	0.287	0.430	-	0.252	0.170	0.630	1.50	0.315	0.441
	3150HR-M	6	1.50	1.417	0.50	0.287	0.430	-	0.252	0.170	0.630	1.50	0.315	0.441
	3200HR	6	2.00	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.315	0.661
	3200HR-M	7	2.00	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.315	0.661
	3250HR	7	2.50	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.080
	3250HR-M	8	2.50	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.080
	3300HR	8	3.00	2.205	1.00	0.551	0.866	-	0.374	0.248	0.787	2.00	0.315	1.918
	3300HR-M	10	3.00	2.205	1.00	0.551	0.866	-	0.374	0.248	0.787	2.00	0.315	1.940

Available Inserts

XNKT-ML

XNKT-MM

Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	**060405PNER-ML**						●			●	●	●				E23
	060405PNSR-MM						●			●	●	●				

Parts

Specification	Screw	Wrench
Ø1.50~Ø3.00	FTKA0306	TW09S

Available Inserts E23

RM3PCA4000 New

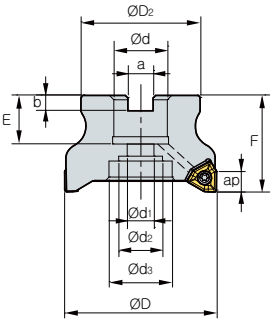


Fig. 1

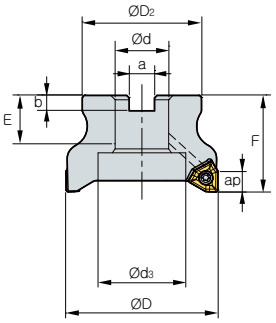


Fig. 2

AA 0°

- AR : -5°
- RR : -8°~-6°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.
RM3PCA	**4150HR**	3	1.5	1.417	0.5	0.287	0.43	-	0.252	0.17	0.63	1.5	0.315	0.45	1
	4150HR-M	4	1.5	1.417	0.5	0.287	0.43	-	0.252	0.17	0.63	1.5	0.315	0.45	1
	4200HR	4	2	1.772	0.75	0.413	0.63	-	0.315	0.22	0.787	1.75	0.315	0.72	1
	4200HR-M	5	2	1.772	0.75	0.413	0.63	-	0.315	0.22	0.787	1.75	0.315	0.72	1
	4250HR	5	2.5	2.205	1	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.15	1
	4250HR-M	6	2.5	2.205	1	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.15	1
	4300HR	5	3	2.205	1	0.551	0.866	-	0.374	0.248	0.787	2	0.315	1.81	1
	4300HR-M	7	3	2.205	1	0.551	0.866	-	0.374	0.248	0.787	2	0.315	1.81	1
	4400HR	7	4	2.874	1.25	0.689	1.024	1.614	0.5	0.319	0.787	2	0.315	3.37	1
	4400HR-M	8	4	2.874	1.25	0.689	1.024	1.614	0.5	0.319	0.787	2	0.315	3.37	1
	4400HR-1.5	7	4	3.386	1.5	-	-	1.969	0.625	0.394	1.181	2	0.315	3.44	2
	4400HR-M-1.5	8	4	3.386	1.5	-	-	1.969	0.625	0.394	1.181	2	0.315	3.44	2
	4500HR	8	5	3.937	1.5	0.827	1.22	1.969	0.626	0.394	1.063	2.5	0.315	7.24	1
	4500HR-M	10	5	3.937	1.5	0.827	1.22	1.969	0.626	0.394	1.063	2.5	0.315	7.30	1

Available Inserts

XNCT-MA

XNKT-ML

XNKT-MM

Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	**080508PNFR-MA**														●	
XNKT	**080508PNER-ML**						●			●	●	●				
	080508PNSR-MM						●			●	●	●				E22
	080512PNSR-MM															E23
	080516PNSR-MM															
	080520PNSR-MM															

Parts

Specification	Screw	Wrench
Ø1.50~Ø5.00	FTKA0408	TW15S

Available Inserts **E22, E23**

RM3PSA3000 Neu

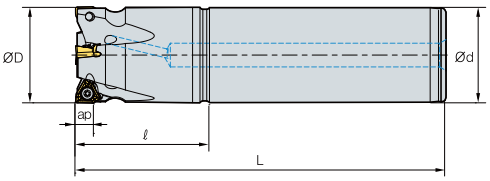


Fig. 1

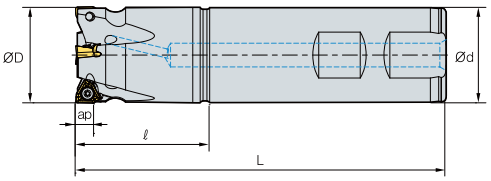


Fig. 2

AA 0°

- AR : -5°
- RR : -16°~-9°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
RM3PSA	**3075HR-2S075**	2	0.75	0.75	1.378	3.346	0.22	0.34	1
	3075HR-2M075	2	0.75	0.75	1.378	5.906	0.22	0.62	1
	3075HR-2L075	2	0.75	0.75	1.378	7.874	0.22	0.86	2
	3100HR-2S100	2	1.00	1.00	1.575	3.937	0.22	0.73	1
	3100HR-2M100	2	1.00	1.00	1.575	5.906	0.22	1.12	1
	3100HR-2L100	2	1.00	1.00	1.575	7.874	0.22	1.51	2
	3100HR-3S100	3	1.00	1.00	1.575	3.937	0.22	0.72	1
	3100HR-3M100	3	1.00	1.00	1.575	5.906	0.22	1.11	1
	3100HR-3L100	3	1.00	1.00	1.575	7.874	0.22	1.5	2
	3125HR-4S125	4	1.25	1.25	1.654	3.937	0.22	1.16	1
	3125HR-4L125	4	1.25	1.25	1.654	7.874	0.22	2.47	2
	3150HR-4S125	4	1.50	1.25	1.654	4.331	0.22	1.5	1
	3150HR-4L125	4	1.50	1.25	1.654	7.874	0.22	2.65	2
	3150HR-4L150	4	1.50	1.50	1.654	7.874	0.22	3.57	2
	3150HR-5S125	5	1.50	1.25	1.654	4.331	0.22	1.49	1
	3150HR-5L125	5	1.50	1.25	1.654	7.874	0.22	2.64	2
	3150HR-5L150	5	1.50	1.50	1.654	7.874	0.22	3.57	2

Available Inserts

XNKT-ML

XNKT-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	**060405PNER-ML**						●			●	●	●				E23
	060405PNSR-MM						●			●	●	●				

Parts

Specification	Screw	Wrench
Ø0.75~Ø1.50	FTKA0306	TW09S

Available Inserts E23

RM3PSA4000 New

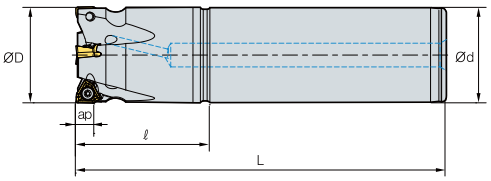


Fig. 1

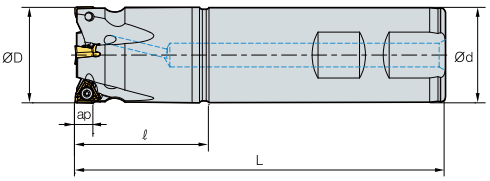


Fig. 2

AA 0°

- AR : -5°
- RR : -5°~-7°

(inch)

Designation		⊙	ØD	Ød	ℓ	L	ap	lbs	Fig.
RM3PSA	**4100HR-2L100**	2	1.00	1.00	1.575	7.874	0.315	1.322	1
	4100HR-2S100	2	1.00	1.00	1.575	4.528	0.315	0.816	2
	4100HR-3L100	3	1.00	1.00	1.575	7.874	0.315	1.322	1
	4100HR-3S100	3	1.00	1.00	1.575	4.528	0.315	0.837	2
	4125HR-4L125	4	1.25	1.25	1.654	7.874	0.315	2.491	1
	4125HR-4S125	4	1.25	1.25	1.654	4.922	0.315	1.499	2
	4150HR-4L125	4	1.50	1.25	1.654	7.874	0.315	2.689	1
	4150HR-4S125	4	1.50	1.25	1.654	5.315	0.315	1.786	2
	4200HR-4L125	4	2.00	1.25	1.654	7.874	0.315	3.042	1
	4200HR-4S125	4	2.00	1.25	1.654	5.315	0.315	2.182	2
	4200HR-5L125	5	2.00	1.25	1.654	7.874	0.315	3.086	1
	4200HR-5S125	5	2.00	1.25	1.654	4.331	0.315	2.205	2

Available Inserts

XNCT-MA

XNKT-ML

XNKT-MM

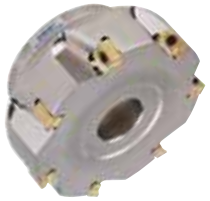
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	**080508PNFR-MA**														●	E22
XNKT	**080508PNER-ML**						●			●	●	●				E23
	080508PNSR-MM						●			●	●	●				
	080512PNSR-MM															
	080516PNSR-MM															
	080520PNSR-MM															

Parts

Specification	Screw	Wrench
Ø1.00~Ø2.00	FTKA0408	TW15

Available Inserts **E22, E23**

RM4PCA3000



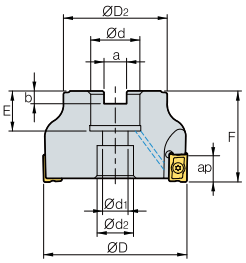


Fig. 1

AA 0°

- AR : -6°
- RR : -19°~-13°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
RM4PCA	**3150HR**	4	1.50	1.417	0.50	0.287	0.433	0.250	0.169	0.630	1.50	0.354	0.5	SB0825
	3150HR-M	5	1.50	1.417	0.50	0.287	0.433	0.250	0.169	0.630	1.50	0.354	0.5	SB0825
	3200HR	5	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	0.8	SB1025
	3200HR-M	7	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	0.8	SB1025
	3250HR	7	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.354	1.3	SB1025
	3250HR-M	9	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.354	1.3	SB1025
	3300HR	8	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.7	SB1230
	3300HR-M	10	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.7	SB1230
	3400HR	9	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	4.3	SB1630
	3400HR-M	12	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	4.2	SB1630

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

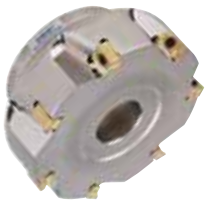
Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**100605PNR-MF**					●				●	●	●				E09
	100605PNR-MM					●				●	●	●				
	100605PNR-MA														●	
	100605PNL-MM									●	●					
	100608PNR-MF					●				●	●					
	100608PNR-MM					●				●						
LNMX	**100605PNR-MF**					●	●			●	●	●				
	100605PNR-MM					●	●	●	●	●	●	●				
	100608PNR-MF						●			●	●					
	100608PNR-MM					●	●				●	●				
	100605PNL-MM					●	●			●	●	●				

Parts

Specification	Screw	Wrench
Ø1.50~Ø4.00	FTKA0307	TW09S

Available Inserts **E09**

RM4PCA4000



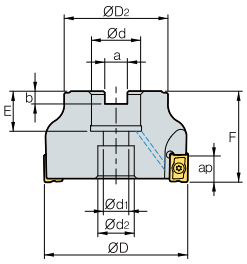


Fig. 1

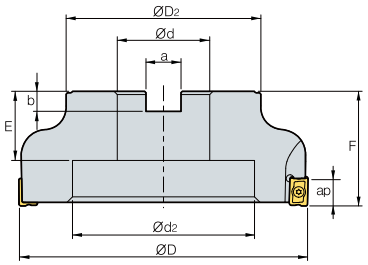


Fig. 2

AA 0°

- AR : -6°
- RR : -19° ~ -13°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt	Fig.
RM4PCA	**4200HR**	3	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.551	0.8	SB1025	1
	4200HR-M	4	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.551	0.8	SB1025	1
	4250HR	4	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.551	1.2	SB1025	1
	4250HR-M	6	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.551	1.3	SB1025	1
	4300HR	5	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.551	2.6	SB1230	1
	4300HR-M	7	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.551	2.5	SB1230	1
	4400HR	5	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.551	4.0	SB1630	1
	4400HR-M	8	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.551	4.0	SB1630	1
	4500HR	7	5.00	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.551	8.3	SB2040	1
	4500HR-M	10	5.00	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.551	8.1	SB2040	1
	4600R	8	6.00	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.551	10.5	MBA	2
	4600R-M	11	6.00	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.551	10.4	MBA	2

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

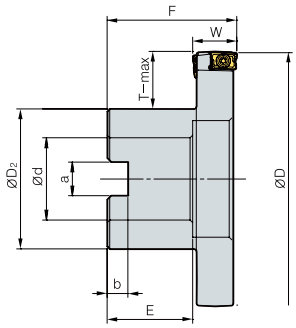
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**151004PNR-MF**					●				●	●	●				E09
	151004PNR-MM									●		●				
	151004PNR-MA														●	
	151008PNR-MF									●	●	●				
	151008PNR-MM					●				●	●	●				
	151008PNR-MA														●	
	151008PNL-MM					●				●	●					
	151016PNR-MF					●				●		●				
	151016PNR-MM									●	●	●				
LNMX	**151004PNR-MF**					●	●			●		●				
	151004PNR-MM						●			●		●				
	151008PNR-MF					●	●			●	●	●				
	151008PNR-MM					●	●	●	●	●	●	●				
	151008PNL-MM						●				●	●				
	151016PNR-MF						●			●	●	●				
	151016PNR-MM					●				●		●				

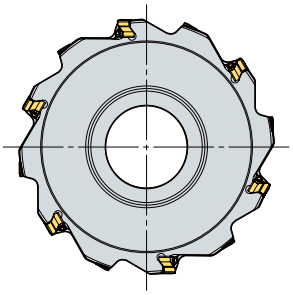
Parts

Specification	Screw	Wrench
Ø2.00~Ø6.00	FTKA0412B	TW15S

Available Inserts **E09**

RM4PFCBA3000





(inch)

Designation		⊙	ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCBA	**3300043R**	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.433	0.673
	3300051R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.512	0.673
	3300059R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.591	0.673
	3300066R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.669	0.673
	3400043R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.433	0.898
	3400051R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.512	0.898
	3400059R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.591	0.898
	3400066R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.669	0.898
	3500043R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.433	1.083
	3500051R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.512	1.083
	3500059R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.083
	3500066R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.669	1.083
	3600043R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.433	1.583
	3600051R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.512	1.583
	3600059R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.583
	3600066R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.669	1.583

Available Inserts

LNEX-MM

LNMX-MM

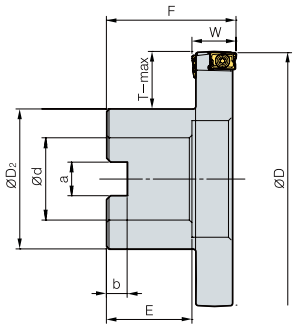
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**100605PNR-MM**					●				●	●	●				E09
	100605PNL-MM									●	●					
LNMX	**100605PNR-MM**					●	●	●	●	●	●	●				
	100605PNL-MM					●	●			●	●	●				

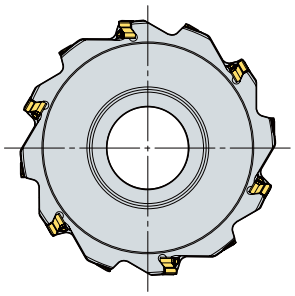
Parts

Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts **E09**

RM4PFCBA4000





(inch)

Designation		⊚	ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCBA	**4300086R**	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.866	0.673
	4300094R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.945	0.673
	4300102R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	1.024	0.673
	4300110R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	1.102	0.673
	4400086R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.866	0.898
	4400094R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.945	0.898
	4400102R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	1.024	0.898
	4400110R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	1.102	0.898
	4500086R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.866	1.083
	4500094R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.945	1.083
	4500102R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	1.024	1.083
	4500110R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	1.102	1.083
	4600086R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.866	1.583
	4600094R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.945	1.583
	4600102R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	1.024	1.583
	4600110R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	1.102	1.583

Available Inserts

LNEX-MM

LNMX-MM

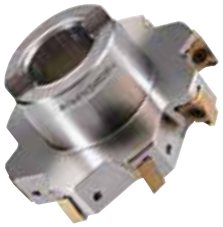
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**151008PNR-MM**					●				●	●	●				E09
	151008PNL-MM					●				●	●					
LNMX	**151008PNR-MM**					●	●	●	●	●	●	●				
	151008PNL-MM						●				●	●				

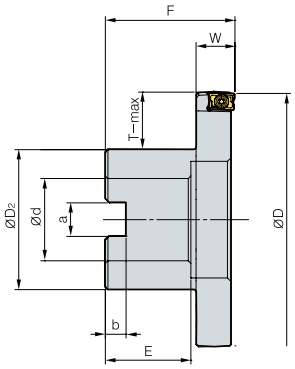
Parts

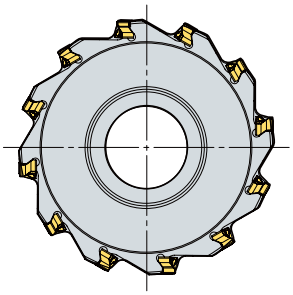
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E09**

RM4PHCBA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCBA	**3300059R**	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.591	0.673
	3400059R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.591	0.898
	3500059R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.083
	3600059R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.583

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

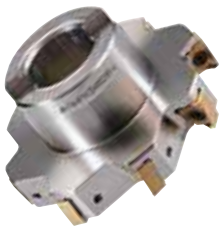
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**100605PNR-MF**					●				●	●	●				E09
	100605PNR-MM					●				●	●	●				
	100605PNR-MA														●	
	100608PNR-MF					●				●	●					
	100608PNR-MM					●				●						
LNMX	**100605PNR-MF**					●	●			●	●	●				
	100605PNR-MM					●	●	●	●	●	●	●				
	100608PNR-MF						●			●	●					
	100608PNR-MM					●	●				●	●				

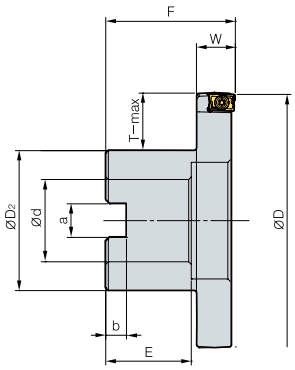
Parts

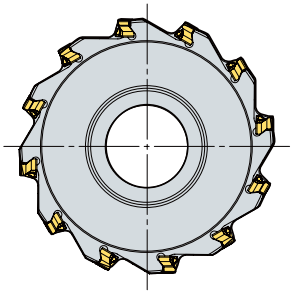
Specification	Screw	Wrench
Ø3.0~Ø6.0	**FTKA0307**	**TW09S**

Available Inserts **E09**

RM4PHCBA4000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCBA	**4300078R**	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.787	0.673
	4400078R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.787	0.898
	4500078R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.787	1.083
	4600078R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.787	1.583

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

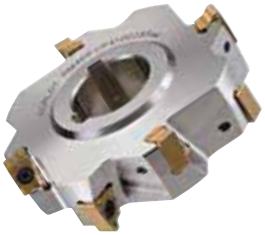
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**151004PNR-MF**					●				●	●	●				E09
	151004PNR-MM									●		●				
	151004PNR-MA														●	
	151008PNR-MF									●	●	●				
	151008PNR-MM					●				●	●	●				
	151008PNR-MA														●	
	151016PNR-MF					●				●		●				
	151016PNR-MM									●	●	●				
LNMX	**151004PNR-MF**					●	●			●	●	●				
	151004PNR-MM						●			●		●				
	151008PNR-MF					●	●			●	●	●				
	151008PNR-MM					●	●	●	●	●	●	●				
	151016PNR-MF						●			●	●	●				
	151016PNR-MM					●				●		●				

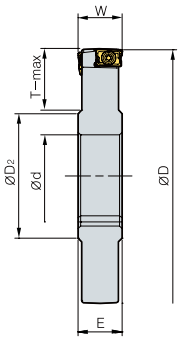
Parts

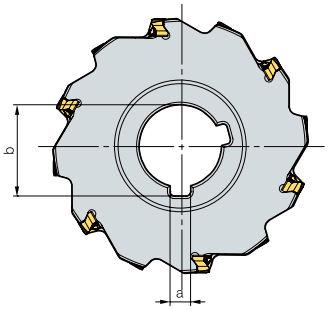
Specification	 Screw	 Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E09**

RM4PFCPA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCPA	3300043R	10	3.0	1.634	1.00	0.25	1.104	0.433	0.433	0.604
	3300051R	10	3.0	1.634	1.00	0.25	1.104	0.512	0.512	0.604
	3300059R	10	3.0	1.634	1.00	0.25	1.104	0.591	0.591	0.604
	3300066R	10	3.0	1.634	1.00	0.25	1.104	0.669	0.669	0.604
	3400043R	12	4.0	1.890	1.25	0.313	1.385	0.433	0.433	0.945
	3400051R	12	4.0	1.890	1.25	0.313	1.385	0.512	0.512	0.945
	3400059R	12	4.0	1.890	1.25	0.313	1.385	0.591	0.591	0.945
	3400066R	12	4.0	1.890	1.25	0.313	1.385	0.669	0.669	0.945
	3500043R	14	5.0	2.283	1.50	0.375	1.666	0.433	0.433	1.280
	3500051R	14	5.0	2.283	1.50	0.375	1.666	0.512	0.512	1.280
	3500059R	14	5.0	2.283	1.50	0.375	1.666	0.591	0.591	1.280
	3500066R	14	5.0	2.283	1.50	0.375	1.666	0.669	0.669	1.280
	3600043R	16	6.0	2.283	1.50	0.375	1.666	0.433	0.433	1.780
	3600051R	16	6.0	2.283	1.50	0.375	1.666	0.512	0.512	1.780
	3600059R	16	6.0	2.283	1.50	0.375	1.666	0.591	0.591	1.780
	3600066R	16	6.0	2.283	1.50	0.375	1.666	0.669	0.669	1.780

Available Inserts

LNEX-MM

LNMX-MM

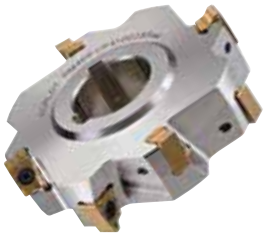
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MM					●				●	●	●				E09
	100605PNL-MM									●	●					
LNMX	100605PNR-MM					●	●	●	●	●	●	●				
	100605PNL-MM					●	●			●	●	●				

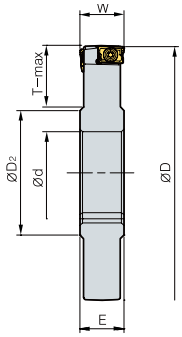
Parts

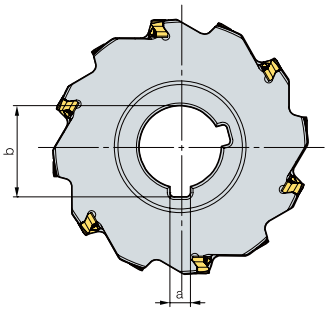
Specification	 Screw	 Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts E09

RM4PFCPA4000







(inch)

Designation		⊚	ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCPA	**4300086R**	6	3.0	1.634	1.00	0.25	1.104	0.866	0.866	0.604
	4300094R	6	3.0	1.634	1.00	0.25	1.104	0.945	0.945	0.604
	4300102R	6	3.0	1.634	1.00	0.25	1.104	1.024	1.024	0.604
	4300110R	6	3.0	1.634	1.00	0.25	1.104	1.102	1.102	0.604
	4400086R	8	4.0	1.890	1.25	0.313	1.385	0.866	0.866	0.945
	4400094R	8	4.0	1.890	1.25	0.313	1.385	0.945	0.945	0.945
	4400102R	8	4.0	1.890	1.25	0.313	1.385	1.024	1.024	0.945
	4400110R	8	4.0	1.890	1.25	0.313	1.385	1.102	1.102	0.945
	4500086R	10	5.0	2.283	1.50	0.375	1.666	0.866	0.866	1.280
	4500094R	10	5.0	2.283	1.50	0.375	1.666	0.945	0.945	1.280
	4500102R	10	5.0	2.283	1.50	0.375	1.666	1.024	1.024	1.280
	4500110R	10	5.0	2.283	1.50	0.375	1.666	1.102	1.102	1.280
	4600086R	12	6.0	2.283	1.50	0.375	1.666	0.866	0.866	1.780
	4600094R	12	6.0	2.283	1.50	0.375	1.666	0.945	0.945	1.780
	4600102R	12	6.0	2.283	1.50	0.375	1.666	1.024	1.024	1.780
	4600110R	12	6.0	2.283	1.50	0.375	1.666	1.102	1.102	1.780

Available Inserts

LNEX-MM

LNMX-MM

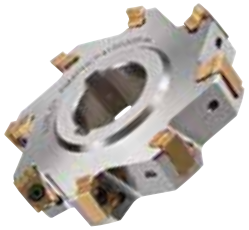
Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**151008PNR-MM**					●				●	●	●				E09
	151008PNL-MM					●				●	●					
LNMX	**151008PNR-MM**					●	●	●	●	●	●	●				
	151008PNL-MM						●				●	●				

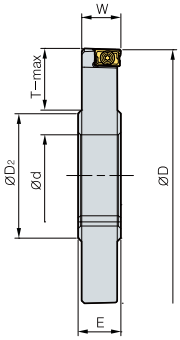
Parts

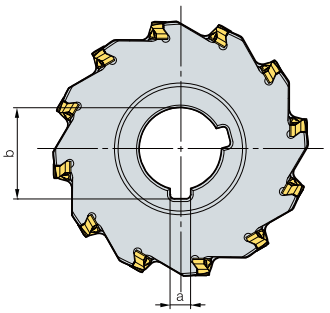
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E09**

RM4PHCPA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCPA	3300059R	10	3.0	1.634	1.00	0.25	1.104	0.650	0.594	0.604
	3400059R	12	4.0	1.890	1.25	0.313	1.385	0.650	0.594	0.945
	3500059R	14	5.0	2.283	1.50	0.375	1.666	0.650	0.594	1.280
	3600059R	16	6.0	2.283	1.50	0.375	1.666	0.650	0.594	1.780

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

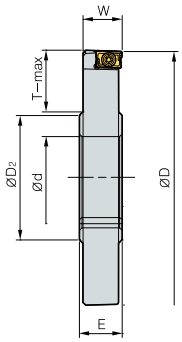
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF					●				●	●	●				E09
	100605PNR-MM					●				●	●	●				
	100605PNR-MA														●	
	100608PNR-MF					●				●	●					
	100608PNR-MM					●				●						
LNMX	100605PNR-MF					●	●			●	●	●				
	100605PNR-MM					●	●	●	●	●	●	●				
	100608PNR-MF						●			●	●					
	100608PNR-MM					●	●				●	●				

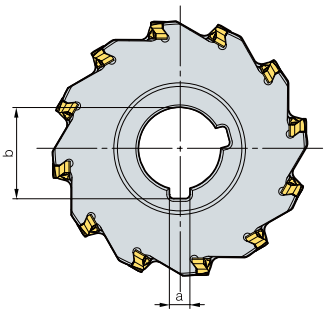
Parts

Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts E09

RM4PHCPA4000





(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCPA	**4300078R**	6	3.0	1.634	1.00	0.25	1.104	0.866	0.780	0.604
	4400078R	8	4.0	1.890	1.25	0.313	1.385	0.866	0.780	0.945
	4500078R	10	5.0	1.890	1.50	0.375	1.666	0.866	0.780	1.280
	4600078R	12	6.0	1.890	1.50	0.375	1.666	0.866	0.780	1.780

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

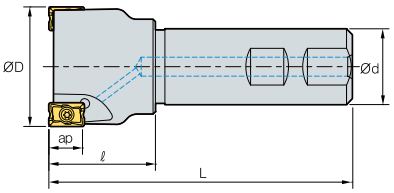
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**151004PNR-MF**					●				●	●	●				E09
	151004PNR-MM									●		●				
	151004PNR-MA														●	
	151008PNR-MF									●	●	●				
	151008PNR-MM					●				●	●	●				
	151008PNR-MA														●	
	151016PNR-MF					●				●		●				
	151016PNR-MM									●	●	●				
LNMX	**151004PNR-MF**					●	●			●	●	●				
	151004PNR-MM						●			●		●				
	151008PNR-MF					●	●			●	●	●				
	151008PNR-MM					●	●	●	●	●	●	●				
	151016PNR-MF						●			●	●	●				
	151016PNR-MM					●				●		●				

Parts

Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E09**

RM4PSA3000



AA 0°

• AR : -6°
• RR : -39°~-16°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
RM4PSA	**3056HR-S062**	1	0.562	0.625	0.906	3.543	0.354	0.2
	3062HR-S062	1	0.625	0.625	0.984	3.543	0.354	0.2
	3068HR-S062	2	0.688	0.625	0.906	3.543	0.354	0.3
	3075HR-S075	2	0.750	0.750	1.181	3.937	0.354	0.5
	3075HR-S075M	3	0.750	0.750	1.181	3.937	0.354	0.5
	3100HR-S100	2	1.000	1.000	1.378	4.528	0.354	0.8
	3100HR-S100M	3	1.000	1.000	1.378	4.528	0.354	0.8
	3125HR-S125	3	1.250	1.250	1.575	4.921	0.354	1.5
	3125HR-S125M	4	1.250	1.250	1.575	4.921	0.354	1.5
	3150HR-S125	4	1.500	1.250	1.654	5.118	0.354	1.9
	3150HR-S125M	5	1.500	1.250	1.654	5.118	0.354	1.9
	3150HR-S150	4	1.500	1.500	1.654	5.118	0.354	2.6
	3150HR-S150M	5	1.500	1.500	1.654	5.118	0.354	2.6
	3150HR-S165	4	1.500	1.654	1.654	5.118	0.354	2.8
	3150HR-S165M	5	1.500	1.654	1.654	5.118	0.354	2.8
	3200HR-S125	5	2.000	1.250	1.772	5.315	0.354	2.3
	3200HR-S125M	7	2.000	1.250	1.772	5.315	0.354	2.3
	3200HR-S150	5	2.000	1.500	1.772	5.315	0.354	3.0
	3200HR-S150M	7	2.000	1.500	1.772	5.315	0.354	3.0
	3200HR-S165	5	2.000	1.654	1.772	5.315	0.354	3.3
	3200HR-S165M	7	2.000	1.654	1.772	5.315	0.354	3.3

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

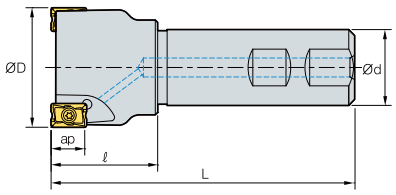
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**100605PNR-MF**					●				●	●	●				E09
	100605PNR-MM					●				●	●	●				
	100605PNR-MA														●	
	100605PNL-MM									●	●					
	100608PNR-MF					●				●	●					
	100608PNR-MM					●				●						
LNMX	**100605PNR-MF**					●	●			●	●	●				
	100605PNR-MM					●	●	●	●	●	●	●				
	100605PNL-MM						●			●	●					
	100608PNR-MF					●	●				●	●				
	100608PNR-MM					●	●			●	●	●				

Parts

Specification	 Screw	 Wrench
Ø0.562~Ø2.000	FTKA0307	TW09S

Available Inserts **E09**

RM4PSA4000



AA 0°

• AR : -6°
• RR : -24°~-14°

(inch)

Designation		◎	ØD	Ød	ℓ	L	ap	lbs
RM4PSA	44125HR-S125	2	1.250	1.250	1.575	4.921	0.551	1.5
	4150HR-S125	3	1.500	1.250	1.654	5.118	0.551	1.8
	4150HR-S150	3	1.500	1.500	1.654	5.118	0.551	2.5
	4150HR-S165	3	1.500	1.654	1.654	5.118	0.551	2.7
	4200HR-S125	3	2.000	1.250	1.772	5.315	0.551	2.2
	4200HR-S125M	4	2.000	1.250	1.772	5.315	0.551	2.2
	4200HR-S150	3	2.000	1.500	1.772	5.315	0.551	3.0
	4200HR-S150M	4	2.000	1.500	1.772	5.315	0.551	2.9
	4200HR-S165	3	2.000	1.654	1.772	5.315	0.551	3.2
	4200HR-S165M	4	2.000	1.654	1.772	5.315	0.551	3.2
	4250HR-S125	4	2.500	1.250	1.772	5.315	0.551	2.8
	4250HR-S125M	6	2.500	1.250	1.772	5.315	0.551	2.7
	4250HR-S150	4	2.500	1.500	1.772	5.315	0.551	3.6
	4250HR-S150M	6	2.500	1.500	1.772	5.315	0.551	3.5
	4250HR-S165	4	2.500	1.654	1.772	5.315	0.551	3.8
	4250HR-S165M	6	2.500	1.654	1.772	5.315	0.551	3.7

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

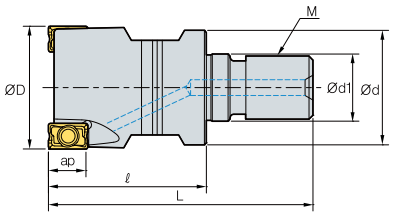
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF					●				●	●	●				E09
	151004PNR-MM											●				
	151004PNR-MA														●	
	151008PNR-MF									●	●	●				
	151008PNR-MM					●				●	●	●				
	151008PNR-MA														●	
	151016PNR-MF					●				●		●				
	151016PNR-MM									●	●	●				
LNMX	151004PNR-MF					●	●			●	●	●				
	151004PNR-MM						●			●		●				
	151008PNR-MF					●	●			●	●	●				
	151008PNR-MM					●	●	●	●	●	●	●				
	151016PNR-MF						●			●	●	●				
	151016PNR-MM					●				●		●				

Parts

Specification	Screw	Wrench
Ø1.250~Ø2.500	FTKA0412B	TW15S

Available Inserts **E09**

RM4PMA3000



AA 0°

• AR : -6°
• RR : -39°~-16°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
RM4PMA	**3056HR-M06**	1	0.563	0.433	0.256	1.575	0.984	M06	0.354	0.04
	3063HR-M08	1	0.625	0.571	0.335	0.654	0.984	M08	0.354	0.04
	3068HR-M08	2	0.688	0.571	0.335	0.654	0.984	M08	0.354	0.07
	3075HR-M10	2	0.750	0.689	0.413	2.008	1.181	M10	0.354	0.13
	3100HR-M12	2	1.000	0.906	0.492	2.323	1.378	M12	0.354	0.24
	3125HR-M16	3	1.250	1.142	0.669	2.638	1.575	M16	0.354	0.46
	3150HR-M16	4	1.500	1.142	0.669	2.638	1.575	M16	0.354	0.57
	3200HR-M16	5	2.000	1.142	0.669	2.835	1.772	M16	0.354	0.90

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM

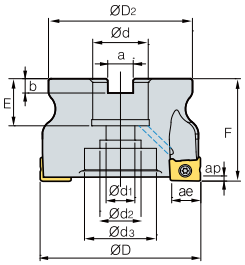
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	**100605PNR-MF**					●				●	●	●				E09
	100605PNR-MM					●				●	●	●				
	100605PNR-MA														●	
	100605PNL-MM									●	●					
	100608PNR-MF					●				●	●					
	100608PNR-MM					●				●						
LNMX	**100605PNR-MF**					●	●			●	●	●				
	100605PNR-MM					●	●	●	●	●	●	●				
	100605PNL-MM					●	●			●	●	●				
	100608PNR-MF						●			●	●					
	100608PNR-MM					●	●				●					

Parts

Specification	Screw	Wrench
Ø0.563~Ø2.000	FTKA0307	TW09S

Available Inserts **E09** Available Adaptors **E252~E253**

RM4ZCA3000/4000 Neu



AA 0°

- AR : -11°
- RR : -12°~-10°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	ae	lbs
RM4ZCA	3150HR	4	1.50	1.417	0.50	0.287	0.433	-	0.250	0.169	0.630	1.50	0.059	0.354	0.4
	3200HR	5	2.00	1.850	0.75	0.433	0.630	-	0.313	0.220	0.787	1.75	0.059	0.354	0.7
RM4ZCA	4250HR	5	2.50	2.283	1.00	0.551	0.827	-	0.375	0.248	0.866	1.75	0.098	0.551	1.2
	4300HR	6	3.00	2.677	1.00	0.551	0.827	-	0.375	0.248	0.866	1.75	0.098	0.551	2.4
	4400HR	7	4.00	3.150	1.25	0.709	1.024	1.575	0.500	0.319	0.866	2.00	0.098	0.551	3.7

Available Inserts

LNEX-MM

LNMX-MM

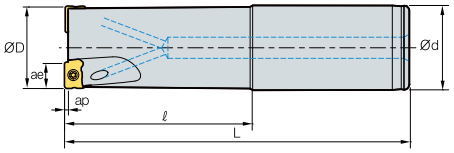
Designation			Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	LNEX	100605PNL-MM									●	●					E09
	LNMX	100605PNL-MM					●	●			●	●	●				
4000 type	LNEX	151008PNL-MM					●				●	●					
	LNMX	151008PNL-MM						●				●	●				

Parts

Specification	Screw	Wrench
Ø1.50~Ø2.00	FTKA0307	TW09S
Ø2.50~Ø4.00	FTKA0412B	TW15S

Available Inserts E09

RM4ZSA3000 New



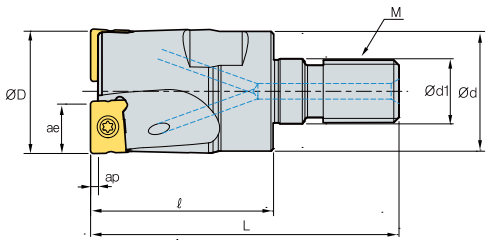
AA 0°

- AR : -11°
- RR : -17°~-14°

(inch)

Designation			ØD	Ød	ℓ	L	ap	ae	lbs
RM4ZSA	**3100HR-L100**	2	1.000	1.000	5.000	8.000	0.059	0.354	1.3
	3125HR-L125	3	1.250	1.250	5.000	8.500	0.059	0.354	2.4
	3150HR-L125	4	1.500	1.500	1.654	10.000	0.059	0.354	3.3

RM4ZMA3000 New



AA 0°

- AR : -11°
- RR : -17°~-14°

(inch)

Designation		Stock		ØD	Ød	Ød1	ℓ	L	M	ap	ae	lbs
RM4ZMA	**3100HR-M12**		2	1.000	0.906	0.492	1.378	2.323	M12	0.059	0.354	0.2
	3125HR-M16	●	3	1.250	1.142	0.669	1.575	2.638	M16	0.059	0.354	0.4
	3150HR-M16		4	1.500	1.142	0.669	1.575	2.638	M16	0.059	0.354	0.6

●Stock item

Available Inserts

LNEX-MM

LNMX-MM

Designation	Cermet		Coated								Uncoated			Page
	CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX 100605PNL-MM									●	●					E09
LNMX 100605PNL-MM					●	●			●	●	●				

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500	FTKA0307	TW09S

Available Inserts **E09**

RM8ACA4000

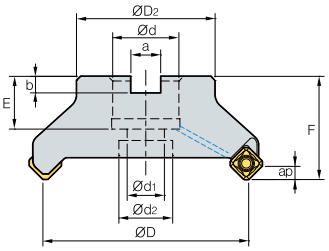


Fig. 1

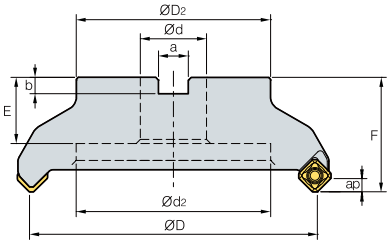


Fig. 2

AA 45°

- AR : -6°
- RR : -9°~-6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ACA	**4200HR-M**	4	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.236	1.1	1
	4200HR-H	6	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.236	1.1	1
	4250HR-M	6	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.236	1.5	1
	4250HR-H	8	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.236	1.5	1
	4300HR	5	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.6	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.6	1
	4300HR-H	10	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.9	1
RM8ACA	**4400HR**	6	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4400HR-H	12	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4500HR	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	7.9	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	7.9	1
	4500HR-H	16	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	8.1	1
	4600R	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	10.6	2
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	11.7	2
	4600R-H	18	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	11.9	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.236	15.6	2
	4800R-H	24	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.236	15.6	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.236	26.2	2
	41000R-H	30	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.236	26.4	2

Available Inserts


SNEX-MF

SNEX-ML


SNEX-MM


SNEX-MA


SNEX-W


SNMX-MF


SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1206ANN-MF**					●	●			●	●	●				E18 E19
	1206ANN-ML										●	●				
	1206ANN-MM			●		●	●		●	●	●	●				
	1206ANN-MA														●	
	1206ANN-W					●				●	●					
SNMX	**1206ANN-MF**					●	●			●	●	●				
	1206ANN-MM			●	●	●	●		●	●	●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø10.0	FTKA0410	TW15S

Available Inserts **E18, E19**

RMH8ACA4000 New

Shim type

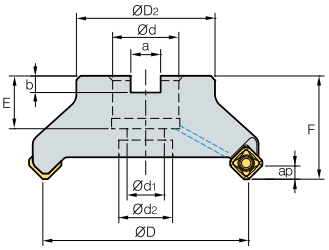


Fig. 1

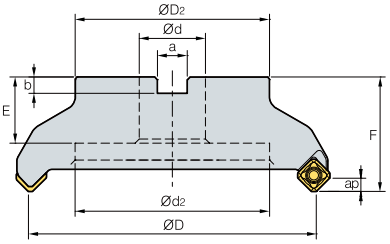


Fig. 2

AA 45°

- AR : -6°
- RR : -9°~-6°

(inch)

Designation		◎	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ACA	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.236	2.6	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.236	3.7	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.236	7.9	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.236	10.6	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.236	15.6	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.236	26.2	2
	41200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.236	40.8	2
	41500R-M	26	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.236	81.8	2

Available Inserts

SNEX-MF

SNEX-ML

SNEX-MM

SNEX-MA

SNEX-W

SNMX-MF

SNMX-MM

Designation		Cermet		Coated							Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ANN-MF					●	●			●	●	●				E18 E19
	1206ANN-ML										●	●				
	1206ANN-MM			●		●	●		●	●	●	●				
	1206ANN-MA														●	
	1206ANN-W					●				●	●					
SNMX	1206ANN-MF					●	●			●	●	●				
	1206ANN-MM			●	●	●	●		●	●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTKA0412B	SS42RM8	SHXN0609F	TW15S

Available Inserts E18, E19

RM8ACA5000

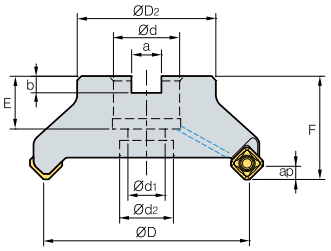


Fig. 1

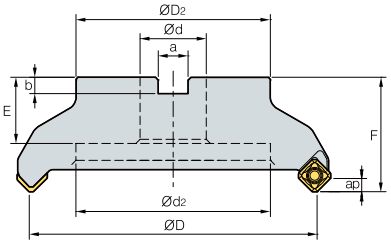


Fig. 2

AA 45°

- AR : -6°
- RR : -9°~-6°

(inch)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ACA	**5300HR-M**	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.295	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.295	3.7	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.295	7.9	1
	5600H-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.295	10.6	2
	5800H-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.295	15.6	2
	51000H-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.295	26.2	2
	51200H-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.50	0.295	47.5	2

Available Inserts


SNEX-MF

SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1507ANN-MF**					●				●	●	●				E18 E19
	1507ANN-ML										●	●				
	1507ANN-MM					●				●	●	●				
SNMX	**1507ANN-MF**					●	●			●	●	●				
	1507ANN-MM					●	●			●	●	●				

Parts

Specification	Screw	Wrench
Ø3.0~Ø12.0	FTGA0513	TW20-100

Available Inserts **E18, E19**

RMH8ACA5000 New

Shim type

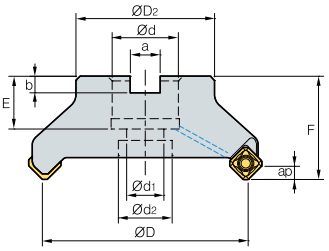


Fig. 1

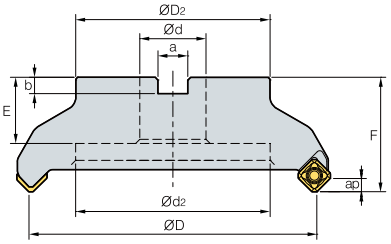


Fig. 2

AA 45°

- AR : -6°
- RR : -9°~-6°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ACA	**5300HR-M**	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.295	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.295	5.4	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.295	7.8	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.295	10.8	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.295	15.4	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.295	25.8	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.295	41.4	2
	51500R-M	22	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.295	81.8	2

Available Inserts

SNEX-MF

SNEX-ML

SNEX-MM

SNMX-MF

SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1507ANN-MF**					●				●	●	●				E18 E19
	1507ANN-ML										●	●				
	1507ANN-MM					●				●	●	●				
SNMX	**1507ANN-MF**					●	●			●	●	●				
	1507ANN-MM					●	●			●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available Inserts **E18, E19**

RM8ECA4000

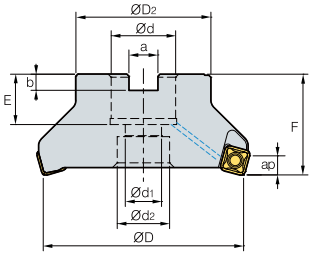


Fig. 1

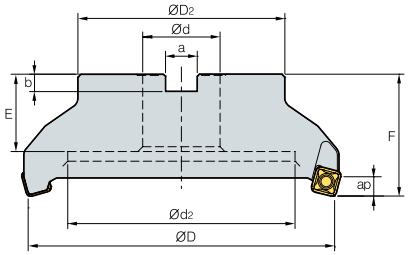


Fig. 2

AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ECA	**4200HR-M**	4	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	1.1	1
	4250HR-M	6	2.5	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	1.3	1
	4300HR	5	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.6	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.4	1
	4400HR	6	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	3.7	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	5.5	1
	4500HR	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.354	6.6	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.354	6.8	1
	4600R	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.354	9.9	2
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.354	8.8	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.354	13.0	2

Available Inserts

SNEX-MF

SNEX-ML

SNEX-MM

SNEX-MA

SNMX-MF

SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC8110	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1206ENN-MF**									●	●	●				
	1206ENN-ML										●	●				
	1206ENN-MM					●	●	●		●	●	●				E18
	1206ENN-MA					●				●					●	E19
SNMX	**1206ENN-MF**					●		●		●	●	●				
	1206ENN-MM					●	●			●	●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø8.0	PTKA0411-R3	TW15S

Available Inserts **E18, E19**

RMH8ECA4000 New

Shim type

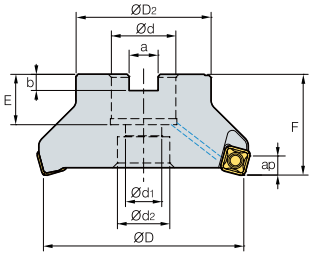


Fig. 1

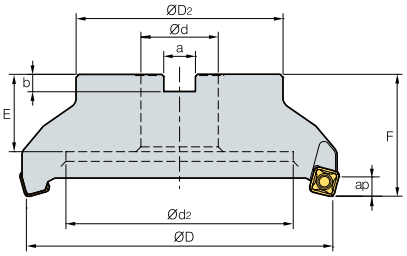


Fig. 2

AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ECA	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.354	2.3	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.354	5.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.354	6.5	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.354	8.6	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.354	12.8	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.354	23.6	2
	41200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.354	39.2	2
	41500R-M	24	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.354	69.0	2

Available Inserts


SNEX-MF


SNEX-ML


SNEX-MM


SNEX-MA


SNMX-MF


SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC8110	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ENN-MF									●	●	●				
	1206ENN-ML										●	●				
	1206ENN-MM					●	●	●		●	●	●				E18
	1206ENN-MA					●				●					●	E19
SNMX	1206ENN-MF					●		●		●	●	●				
	1206ENN-MM					●	●			●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available Inserts E18, E19

RM8ECA5000

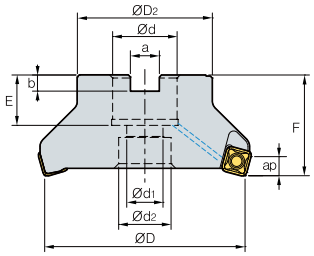


Fig. 1

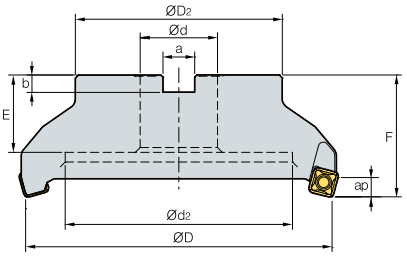


Fig. 2

AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ECA	**5300HR-M**	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.433	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.433	3.7	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.433	7.9	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.433	10.6	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.433	15.6	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.433	26.2	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.50	0.433	47.5	2

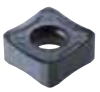
Available Inserts


SNEX-MF

SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1507ENN-MF**					●				●	●	●				E18 E19
	1507ENN-ML										●	●				
	1507ENN-MM					●				●	●	●				
SNMX	**1507ENN-MF**					●	●			●	●	●				
	1507ENN-MM					●	●			●	●	●				

Parts

Specification	 Screw	 Wrench
Ø3.0~Ø12.0	FTGA0513	TW20-100

Available Inserts **E18, E19**

RMH8ECA5000 New

Shim type

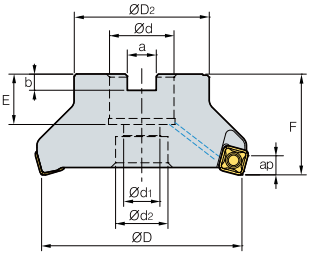


Fig. 1

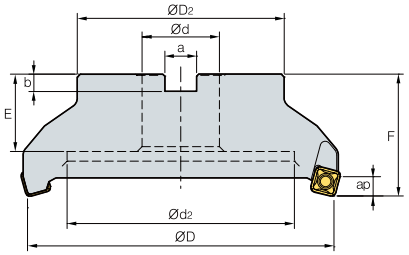


Fig. 2

AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ECA	5300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.433	2.3	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.433	4.5	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.433	7.3	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.433	9.5	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.433	13.8	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.433	23.8	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.433	39.0	2
	51500R-M	22	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.433	77.4	2

Available Inserts

SNEX-MF

SNEX-ML

SNEX-MM

SNMX-MF

SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ENN-MF					●				●	●	●				E18 E19
	1507ENN-ML										●	●				
	1507ENN-MM					●				●	●	●				
SNMX	1507ENN-MF					●	●			●	●	●				
	1507ENN-MM					●	●			●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available Inserts E18, E19

RM8QCA4000

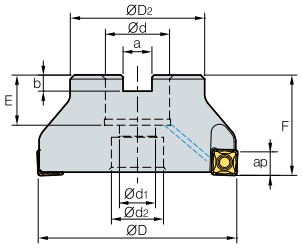


Fig. 1

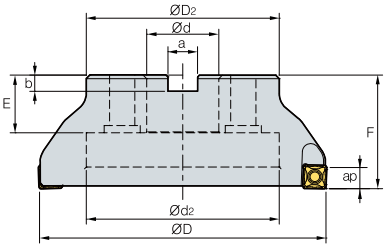


Fig. 2

AA 2°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8QCA	**4250HR-M**	6	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.453	1.2	1
	4250HR-H	8	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.453	1.2	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.453	2.3	1
	4300HR-H	10	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.453	2.1	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.453	3.6	1
	4400HR-H	12	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.453	3.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.453	7.1	1
	4500HR-H	14	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.453	7.1	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.453	8.5	2
	4600R-H	18	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.453	8.5	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.453	14.0	2
	4800R-H	22	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.453	14.0	2

Available Inserts


SNEX-MF


SNEX-ML


SNEX-MM


SNEX-MA


SNMX-MF


SNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1206QNN-MF**					●				●	●	●				E17 E18 E19
	1206QNN-ML										●	●				
	1206QNN-MM					●				●	●	●				
	1206QNN-MA														●	
	120612-MF									●	●	●				
	120612-ML										●	●				
	120612-MM									●						
	120612-MA														●	
SNMX	**1206QNN-MF**					●	●			●	●	●				
	1206QNN-MM					●	●			●	●	●				
	120612-MF					●	●			●		●				
	120612-MM					●	●			●	●	●				

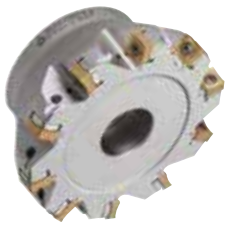
Parts

Specification	Screw	Wrench
Ø2.5~Ø8.0	PTKA0411-R3	TW15S

Available Inserts **E17, E18, E19**

RMH8QCA4000 New

Shim type



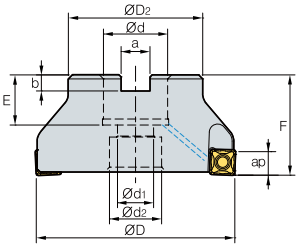


Fig. 1

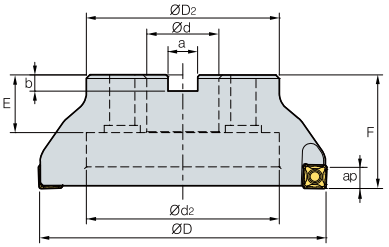


Fig. 2

AA 2°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8QCA	**4300HR-M**	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.453	2.3	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.453	5.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.453	6.5	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.453	8.6	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.453	10.8	2

Available Inserts

SNEX-MF

SNEX-ML

SNEX-MM

SNEX-MA

SNMX-MF

SNMX-MM

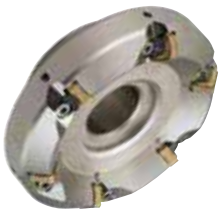
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	**1206QNN-MF**					●				●	●	●				E18
	1206QNN-ML										●	●				
	1206QNN-MM					●				●	●	●				
	1206QNN-MA														●	
	120612-MF									●	●	●				
	120612-ML										●	●				
	120612-MM									●						
	120612-MA														●	
SNMX	**1206QNN-MF**					●	●			●	●	●				
	1206QNN-MM					●	●			●	●	●				
	120612-MF					●	●			●		●				
	120612-MM					●	●			●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø8.0	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available Inserts **E18**

RMT8AA4000



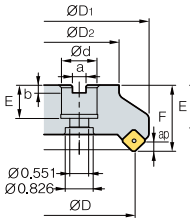


Fig. 1

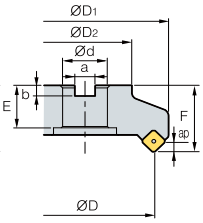


Fig. 2

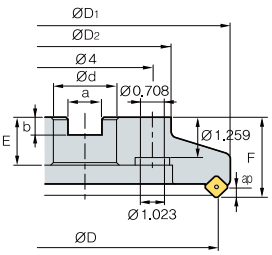


Fig. 3

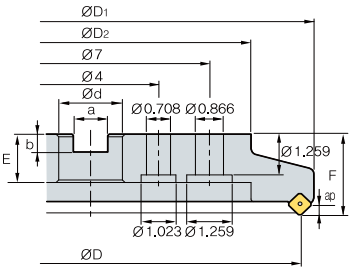


Fig. 4

AA
45°

- AR : -6°
- RR : -6°

(inch)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8AA	**4300R/L**	5	3.0	3,780	2.205	1.0	0.374	0.248	0.866	2.0	0.157	3.52	1
	4300R/L-M	6	3.0	2,953	2.205	1.0	0.374	0.248	0.866	2.0	0.157	3.52	1
	4400R/L	6	4.0	4,803	2.874	1.3	1.500	0.319	1.181	2.0	0.157	5.06	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	1.500	0.319	1.181	2.0	0.157	5.06	2
	4500R/L	8	5.0	5.748	3.386	1.5	1.626	0.394	1.496	2.5	0.157	9.46	2
	4500R/L-M	10	5.0	4.961	3.386	1.5	1.626	0.394	1.496	2.5	0.157	9.46	2
	4600R/L	10	6.0	6.732	4.882	2.0	0.748	0.433	1.496	2.5	0.157	14.30	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.496	2.5	0.157	14.30	2
	4800R/L	12	8.0	8.740	5.118	2.5	1.000	0.551	1.496	2.5	0.157	19.36	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.157	19.36	3
	41000R/L	16	10.0	10.748	7.087	2.5	1.000	0.551	1.496	2.5	0.157	31.02	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.157	31.02	3
	41200R/L	20	12.0	8.819	9.449	2.5	1.000	0.551	1.496	2.5	0.157	49.06	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.157	49.06	4

Available Inserts

SNCAF-MF

SNCAF-MM

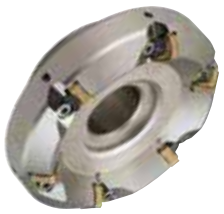
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	**1206ANN-MF**															E16 E17 E18
	1206ANN-MM					●										
SNMF	**1206ANN-MF**															
	1206ANN-MM															

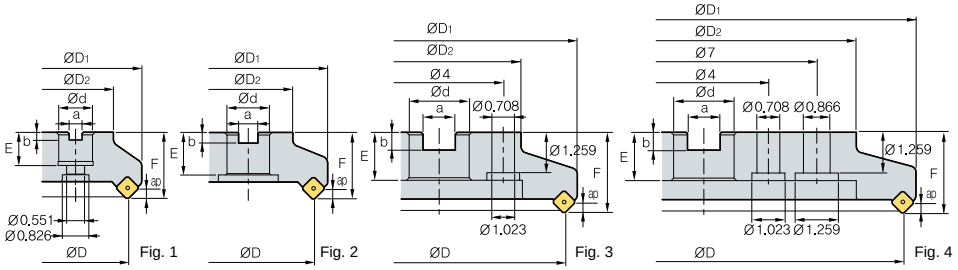
Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts **E16, E17, E18**

RMT8AA5000





AA 45° • AR : -6° • RR : -6°

(inch)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8AA	**5300R/L**	5	3.0	3.937	2.205	1.0	0.374	0.248	0.866	2.0	0.236	3.96	1
	5300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.319	0.866	2.0	0.236	3.96	1
	5400R/L	6	4.0	4.961	2.874	1.3	1.500	0.319	0.866	2.0	0.236	5.72	2
	5400R/L-M	8	4.0	3.996	2.874	1.3	1.500	0.394	0.866	2.0	0.236	5.72	2
	5500R/L	8	5.0	5.945	3.386	1.5	1.626	0.394	1.181	2.5	0.236	9.46	2
	5500R/L-M	10	5.0	4.961	3.386	1.5	1.626	0.433	1.181	2.5	0.236	9.46	2
	5600R/L	10	6.0	6.929	4.882	2.0	0.748	0.433	1.181	2.5	0.236	14.30	2
	5600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.551	1.181	2.5	0.236	14.30	2
	5800R/L	12	8.0	8.937	5.118	2.5	1.000	0.551	1.496	2.5	0.236	19.80	3
	5800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.236	19.80	3
	51000R/L	16	10.0	10.945	7.087	2.5	1.000	0.551	1.496	2.5	0.236	31.68	3
	51000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.236	31.68	3
	51200R/L	20	12.0	12.953	9.449	2.5	1.000	0.551	1.496	2.5	0.236	48.84	4
	51200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.236	48.84	4

Available Inserts

SNCAF-MF

SNCAF-MM

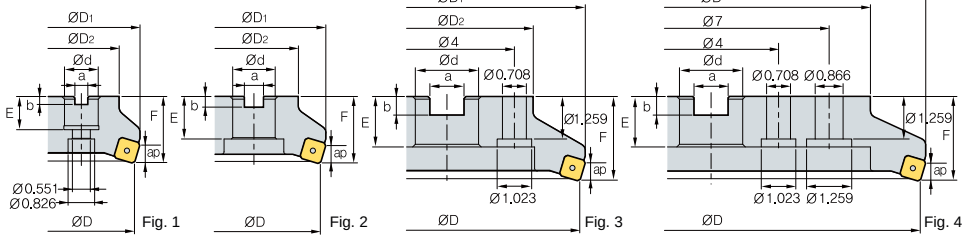
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	**1507ANN-MF**									●						E16 E17 E18
	1507ANN-MM					●										
SNMF	**1507ANN-MF**															
	1507ANN-MM					●										

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available Inserts **E16, E17, E18**

RMT8EA4000



AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8EA	**4300R/L**	5	3.0	3.268	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.30	1
	4300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.30	1
	4400R/L	6	4.0	4.291	2.874	1.3	0.500	0.319	0.866	2.0	0.197	4.40	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	4.40	2
	4500R/L	8	5.0	5.276	3.386	0.5	0.626	0.394	1.181	2.5	0.197	8.36	2
	4500R/L-M	10	5.0	4.496	3.386	0.5	0.626	0.394	1.181	2.5	0.197	8.36	2
	4600R/L	10	6.0	6.299	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.76	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.76	2
	4800R/L	12	8.0	8.268	5.118	2.5	1.000	0.551	1.496	2.5	0.197	17.38	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	17.38	3
	41000R/L	16	10.0	10.276	7.087	2.5	1.000	0.551	1.496	2.5	0.197	28.60	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	28.60	3
	41200R/L	20	12.0	12.283	9.449	2.5	1.000	0.551	1.496	2.5	0.197	45.10	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	45.10	4

Available Inserts

SNCAF-MF

SNCAF-MM

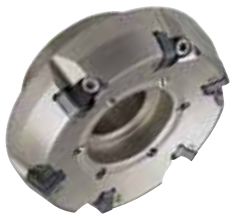
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	**1206ENN-MF**									●						E16
	1206ENN-MM					●										E17
SNMF	**1206ENN-MF**					●										E18
	1206ENN-MM					●										

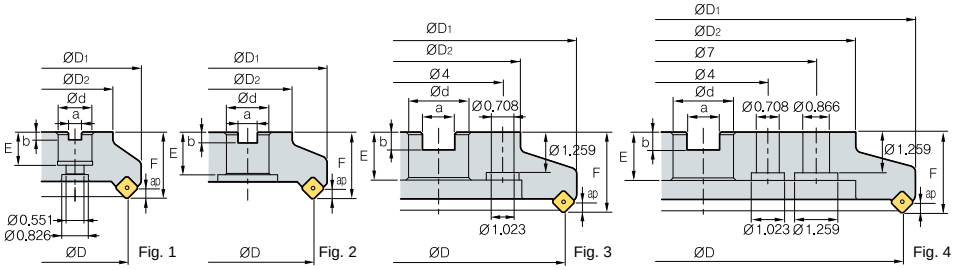
Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts **E16, E17, E18**

RMT8EA5000





AA 15°

- AR : -6°
- RR : -8°~-6°

(inch)

Designation		⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8EA	**5300R/L**	5	3.0	3.307	2.205	1.0	0.374	0.248	0.866	2.0	0.315	3.08	1
	5300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.315	4.18	1
	5400R/L	6	4.0	4.331	2.874	1.3	0.500	0.319	0.866	2.0	0.315	4.18	2
	5400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.315	4.18	2
	5500R/L	8	5.0	5.315	3.386	0.5	0.626	0.394	1.181	2.5	0.315	8.14	2
	5500R/L-M	10	5.0	4.961	3.386	0.5	0.626	0.394	1.181	2.5	0.315	8.14	2
	5600R/L	10	6.0	6.339	4.882	2.0	0.748	0.433	1.181	2.5	0.315	12.54	2
	5600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.315	12.54	2
	5800R/L	12	8.0	8.307	5.118	2.5	1.000	0.551	1.496	2.5	0.315	16.50	3
	5800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.315	16.50	3
	51000R/L	16	10.0	10.315	7.087	2.5	1.000	0.551	1.496	2.5	0.315	27.28	3
	51000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.315	27.28	3
	51200R/L	20	12.0	12.323	9.449	2.5	1.000	0.551	1.496	2.5	0.315	43.78	4
	51200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.315	43.78	4

Available Inserts

SNCAF-MF

SNCAF-MM

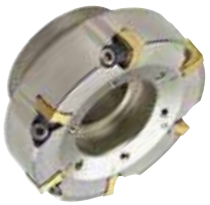
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	**1507ENN-MF**					●				●						E16 E17 E18
	1507ENN-MM															
SNMF	**1507ENN-MF**															
	1507ENN-MM					●										

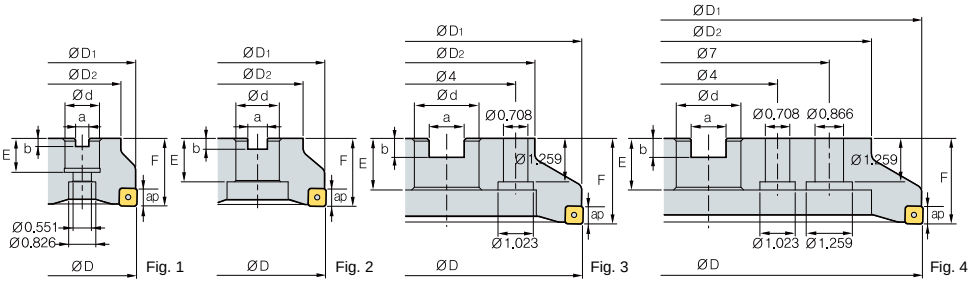
Parts

Specification	 Screw	 Screw	 Spring	 Latch	 Wrench
Ø3.0~Ø12.0	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available Inserts **E16, E17, E18**

RMT8QA4000





AA 2°

- AR : -6°
- RR : -11°~6°

(inch)

Designation		⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8QA	**4300R/L**	5	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.08	1
	4300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.08	1
	4400R/L	6	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	3.86	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	3.86	2
	4500R/L	8	5.0	4.961	3.386	1.5	0.626	0.394	1.181	2.5	0.197	7.92	2
	4500R/L-M	10	5.0	4.961	3.386	1.5	0.626	0.394	1.181	2.5	0.197	7.92	2
	4600R/L	10	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.54	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.54	2
	4800R/L	12	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	16.50	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	16.50	3
	41000R/L	16	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	27.50	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	27.50	3
	41200R/L	20	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	43.78	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	43.78	4

Available Inserts

SNMF-MF

SNMF-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNMF	**1206QNN-MF**					●										E18
	1206QNN-MM					●										

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts **E18**

RM16ACA6000

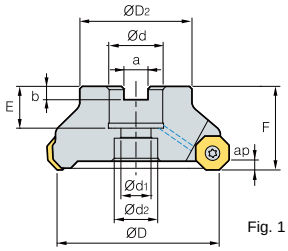


Fig. 1

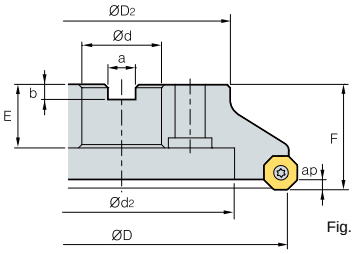


Fig. 2

AA 45°
• AR : -6°
• RR : -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM16ACA	6250HR-M	5	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.157	1.5	1
	6250HR-H	7	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.157	1.5	1
	6300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.157	2.6	1
	6300HR-H	8	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.157	2.6	1
	6400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.157	4.2	1
	6400HR-H	10	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.157	4.2	1
	6500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.157	7.7	1
	6500HR-H	14	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.157	7.7	1
	6600R-M	10	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.157	9.0	2
	6600R-H	16	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.157	9.0	2
	6800R-M	12	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.157	13.4	2
	6800R-H	20	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.157	13.4	2

Available Inserts


ONHX-MF


ONHX-ML


ONHX-MM


ONHX-W


ONHX-MA


ONMX-MF


ONMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	060608-MM					●				●	●	●				E11
	060608-MF					●				●	●	●				
	060608-ML										●	●				
	060608-MA														●	
	060608-W					●			●	●	●					
	0606ANN-MM									●	●	●				
	0606ANN-MF									●	●	●				
ONMX	060608-MM					●	●			●	●	●				
	060608-MF					●	●			●	●	●				
	0606ANN-MM					●	●			●	●	●				
	0606ANN-MF						●		●	●	●	●				

Parts

Specification	Screw	Wrench
Ø2.5~Ø8.0	FTGA0513	TW20-100

Available Inserts E11

RM16ACA8000

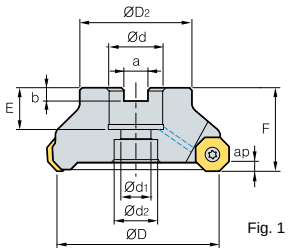


Fig. 1

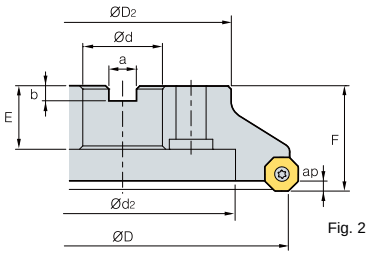


Fig. 2

AA 45°

- AR : -6°
- RR : -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM16ACA	8250HR-M	5	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.216	1.5	1
	8250HR-H	6	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.216	1.5	1
	8300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.216	2.6	1
	8300HR-H	7	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.216	2.6	1
	8400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.216	4.0	1
	8400HR-H	9	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.216	4.0	1
	8500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.216	7.7	1
	8500HR-H	10	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.216	7.7	1
	8600R-M	10	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.216	9.9	2
	8600R-H	14	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.216	9.9	2
	8800R-M	12	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.216	12.8	2
	8800R-H	16	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.216	12.8	2

Available Inserts


ONHX-MF


ONHX-ML


ONHX-MM


ONHX-W


ONHX-MA


ONMX-MF


ONMX-MM

Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	080608-MM					●				●	●	●				E11
	080608-MF									●	●	●				
	080608-ML										●	●				
	080608-W					●				●	●					
	080608-MA														●	
	0806ANN-MM									●	●	●				
	0806ANN-MF									●	●	●				
ONMX	080608-MM					●	●		●	●	●	●				
	080608-MF						●			●	●	●				
	0806ANN-MM					●	●		●	●	●	●				
	0806ANN-MF					●	●			●	●	●				

Parts

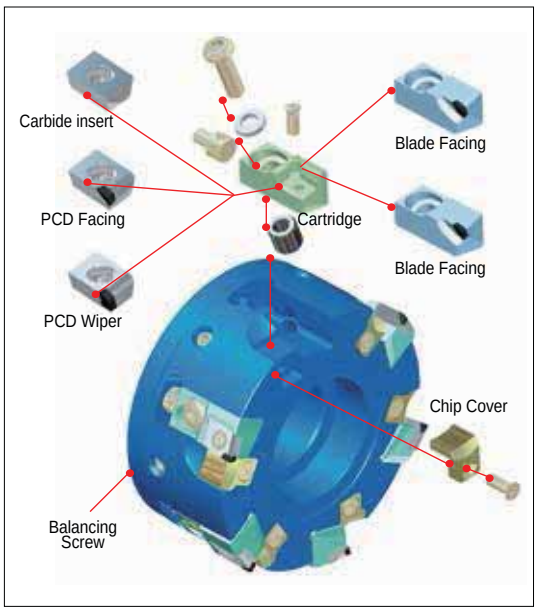
Specification	Screw	Wrench
Ø2.5~Ø8.0	FTGA0513	TW20-100

Available Inserts E11

Lighter tool ensures excellent performance in high speed machining.

Aero Mill

- Excellent machining performance can be acquired especially at the high speeds due to the light aluminum cutter body that is 50% of the weight of a conventional steel cutter body
- High speed milling cutter for precise machining
- Special Aluminum material and high rake angle of insert provide rigid & stable machining
- High tolerance surface finishs can be acquired due to the low cutting load provided from the high rake angle
- Balanceable up to G2.5 level



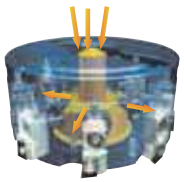
Assembly structure of cutter

- ▶ Increased stability based on cartridge type application
- ▶ Both insert and blade can be available in the same cutter
- ▶ Finishing to roughing can be possible because of wide chip pocket space
- ▶ Roughing and finishing available with carbide, PCD insert application
- ▶ Cutter breakage can be solved by making use of the chip cover

Coolant through system

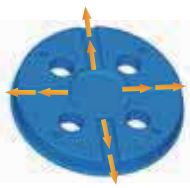
- ▶ Specially designed coolant through system provides coolant from the center of the cutter to the insert enhances the cooling rate and chip evacuation.
- ▶ Direction of coolant has designed to focus directly to the insert cutting edge to maximize chip evacuation and improve tool life
- ▶ Coolant bolt is applicable up to Ø6, coolant cover is applicable from Ø8 and over. Coolant devices are sold seperately for through coolant system, through coolant arbor has to be used

Coolant Bolt



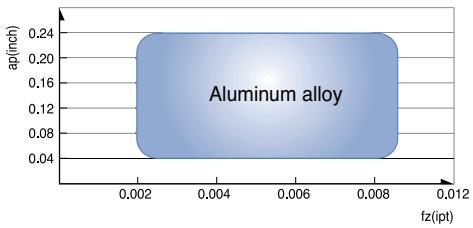
For Ø3~Ø6

Coolant Cover

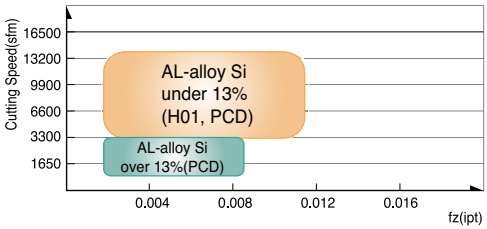


For Ø8 and over

Application range

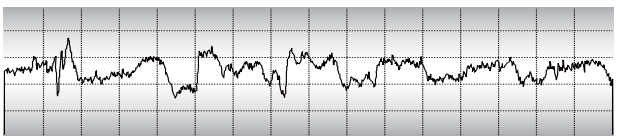


Recommended cutting condition



Surface finish

- **Cutting condition** — **vc** : 5200sfm, **vf** : 120ipm, **n** : 5000 min^{-1}, **fz** : 0.004ipt, **ap** : 0.02inch, **Machine** : PCV620
- **Workpiece** — A6061
- **Designation** — **Cutter** : APD100R-A6Z (6Flutes), **Insert** : CDEW1204R-XCF(H01)



- Rmax : 2.1㎛
- Rz : 1.6㎛
- Ra : 0.3㎛

Max. revolution

Diameter(inch)	Max. revolution(rpm)
Ø3	16,000
Ø4	15,000
Ø5	12,500
Ø6	10,000
Ø8	8,000
Ø10	6,500
Ø12	5,000

Coolant parts

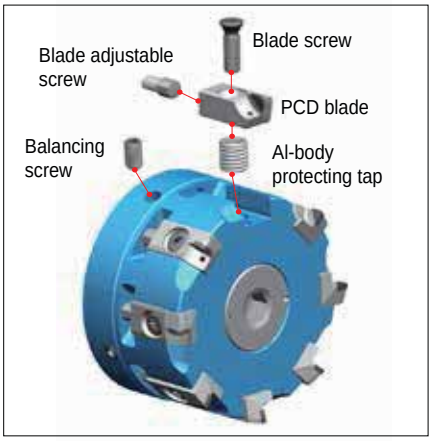
Diameter(inch)	Type	Designation		Shape	Note
Ø3	Coolant Bolt	CBP080-IN/MM			Extra charge
Ø4	Coolant Bolt	CBP100-IN	CBP100-MM-1		
Ø5	Coolant Bolt	CBP125-IN	CBP125-MM-1		
Ø6	Coolant Bolt	CBP160-IN	CBP160-MM		
Ø8	Coolant Cover	CCP200			
Ø10	Coolant Cover	CCP250			
Ø12	Coolant Cover	CCP315			

• Choice : CBP100-IN : APD type, General for unmarked item

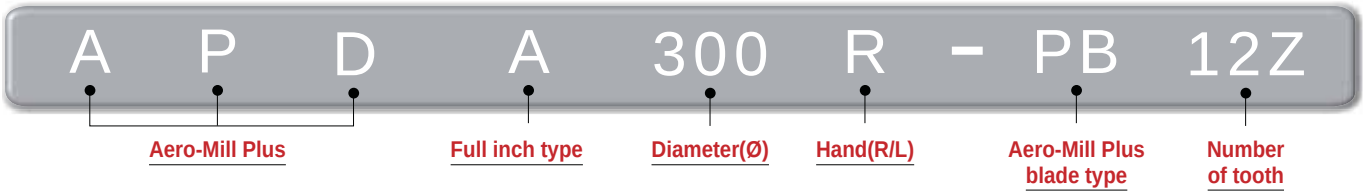
Cone Shaped Head Indexable Drill

Aero Mill Plus

- Improve tool life up to 20% with a coolant system that enables direct spray cooling to cutting blades.
- Enable high feed milling by increasing the number of cutting blades by 20% through a simply structured coupling method for clamps
- Reduce setting time up to 40% by applying a spanner adjustment method
- Introduce an aluminum cutter body to provide a superior cutting performance during high speed milling.



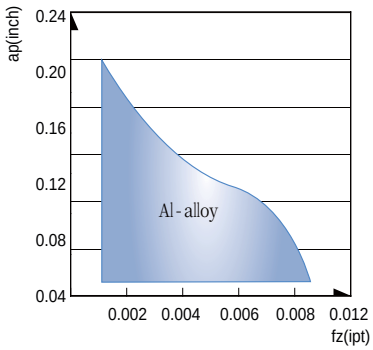
Code system



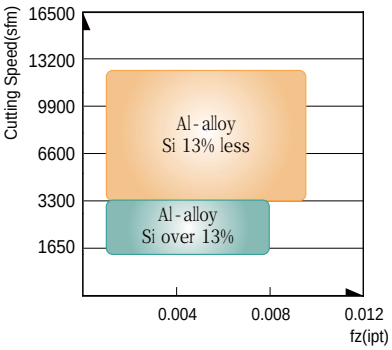
Structure of Aero Mill Plus

- Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing.
- Provide PCD Blade-dedicated cutter design to offer stable tool life and increase of applied blades.
- Improve the blade life by applying a coolant system that enables direct spray cooling to cutting blades.
- Adopt a clamping method with simple structure without set screw.
- Reduce weight and apply a coolant bolt that is exclusively used for Aero-Mill Plus that applies coolant to remove internal chip.

Application range



Recommended cutting speed



Max. RPM

Diameter(inch)	Max. revolution(rpm)
Ø3	20,000
Ø4	18,000
Ø5	16,000
Ø6	13,000
Ø8	10,000
Ø10	8,000
Ø12	7,000

Coolant parts

Diameter(inch)	Type	Designation	Shape	Material	Note
Ø3	Coolant bolt	CB-AMP300-IN		Steel	Included
Ø4		CB-AMP400-IN			
Ø5		CB-AMP500-IN			
Ø6		CB-AMP600-IN			
Ø8	Coolant cover	CCV-AMP800-IN		Aluminum	Extra charge
Ø10		CCV-AMP1000-IN			
Ø12		CCV-AMP1200-IN			

Good performance in small-medium size of operations

Aero Mill Mini

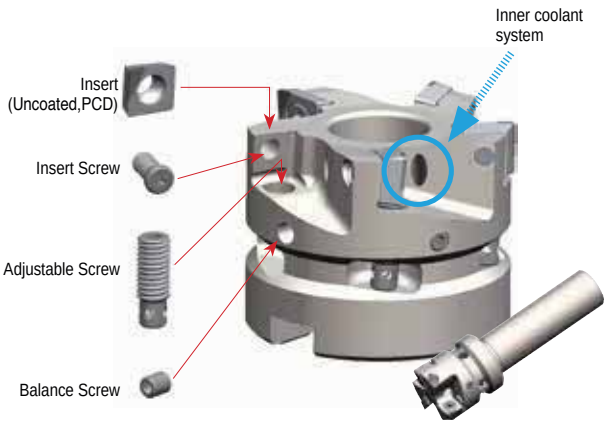
- Good performance in small-medium size of operations
- Good duration of the steel body
- Choice of Uncoated carbide / PCD grades can be applied to various kind of work material
- Balance level : G2.5

Code system

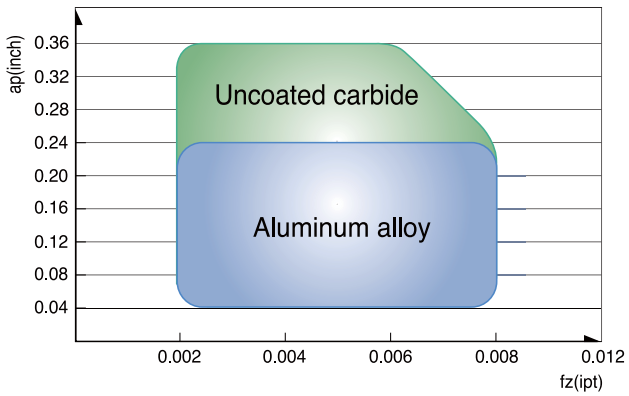
M	A	P	D	S	A	400	–	H	R	Z4
Mini	Aero-Mill	Approach Angle	Insert Clearance Angle	None : Cutter S : Shank	A : Inch	Diameter(Ø)		H : Coolant	Hand(R/L)	Number of tooth

Structure of Aero Mill Mini

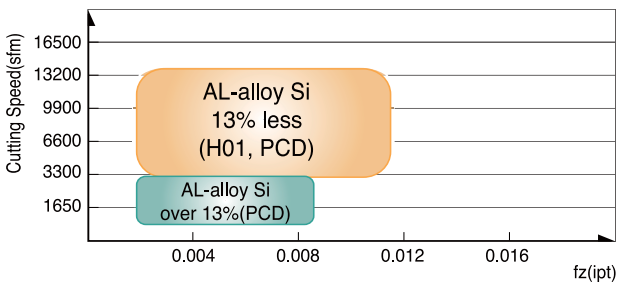
- ▶ Simple and strong design of Screw-on clamping.
- ▶ Adjustable range : ±0.004inch Max
- ▶ Adjustable step : Min. 2 micro meter
- ▶ Wide chip pocket area for Roughing and Aluminum machining.
- ▶ Inner coolant system



Application range



Recommended cutting condition

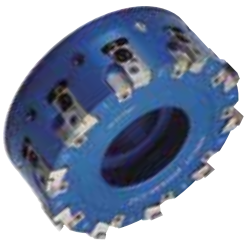


Max. RPM

Diameter	Max. RPM(min^{-1})
Ø1.25	26,000
Ø1.50	24,500
Ø2.00	22,000
Ø2.50	20,000

APDA-A

Cartridge + Insert



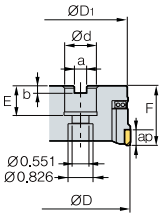


Fig. 1

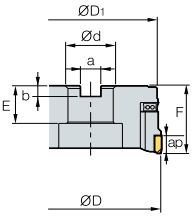


Fig. 2

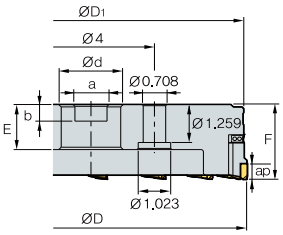


Fig. 3

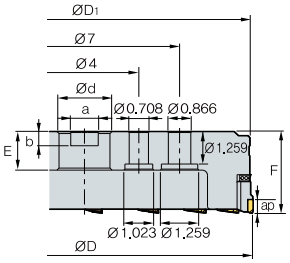


Fig. 4

AA 0°
- AR : 6°
- RR : 5°~9°

(inch)

Designation			ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	lbs	Fig.
APDA	**300R/L-A6Z**	6	3.0	2.843	1.000	0.375	0.248	0.866	2.000	0.24	16000	1.7	1
	400R/L-A6Z	6	4.0	3.803	1.250	0.500	0.319	0.866	2.000	0.24	15000	2.1	2
	500R/L-A8Z	8	5.0	4.804	1.500	0.625	0.394	1.181	2.500	0.24	12500	4.0	2
	600R/L-A10Z	10	6.0	5.803	2.000	0.750	0.433	1.181	2.500	0.24	10000	6.4	2
	800R/L-A12Z	12	8.0	7.803	2.500	1.000	0.551	1.496	2.500	0.24	8000	8.8	3
	1000R/L-A16Z	16	10.0	9.803	2.500	1.000	0.551	1.496	2.500	0.24	6500	13.9	3
	1200R/L-A18Z	18	12.0	11.803	2.500	1.000	0.551	1.496	3.125	0.24	5000	24.9	4

Available Inserts


CDEW-XCF


CDEW-XAF,NAF


CDEW-XAW,NAW

Designation		Cermet			Uncoated				PCD	Page
		CN2000	CN20	CN30	H01	G10	ST30A	ST20	DP200	
CDEW	**1204R-XCF**				●					
	1204L-XCF									
	1204R-XAF								●	
	1204L-XAF									E06
	1204R-NAF								●	E07
	1204R-XAW								●	
	1204L-XAW									
	1204R-NAW								●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
Aluminum	3,300 ~ 13,200 1,650 ~ 8,250	0.002 ~ 0.012 0.002 ~ 0.008	**DP200** **H01**

Parts

Specification	Cartridge	Chip cover	Chip cover Screw	Insert Screw	Adjust Screw	Cartridge Screw	Wrench for Insert	Wrench for Cartridge
Ø3.0~Ø12.0	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411	AZ0514	BHA0619-NYLOK	TW15S	HW50

Available Inserts **E06, E07**

APDA-PB

Blade

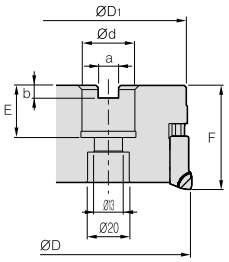


Fig. 1

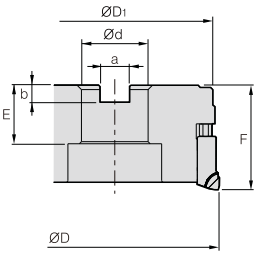


Fig. 2

AA 0°

- AR : 6°
- RR : -4°~1°

(inch)

Designation			MAX	ØD	ØD1	Ød	a	b	E	F	ap	lbs	Fig.
APDA-PB	**300R-PB6Z**	6	10	3	2.882	1	0.375	0.248	0.787	2	0.196	1.1	1
	300R-PB8Z	8	10	3	2.882	1	0.375	0.248	0.787	2	0.196	1.2	1
	400R-PB6Z	6	12	4	3.882	1.25	0.5	0.319	0.984	2	0.196	2.1	2
	400R-PB8Z	8	12	4	3.882	1.25	0.5	0.319	0.984	2	0.196	2.1	2
	500R-PB8Z	8	14	5	4.882	1.5	0.625	0.394	1.26	2.5	0.196	4.3	2
	500R-PB10Z	10	14	5	4.882	1.5	0.625	0.394	1.26	2.5	0.196	4.2	2
	600R-PB10Z	10	20	6	5.882	2	0.750	0.433	1.26	2.5	0.196	6.6	2
	600R-PB12Z	12	20	6	5.882	2	0.750	0.433	1.26	2.5	0.196	6.8	2

Available Blades

BAMPR-XAF

BAMPR-XAW

BAMPR-XAWR

Designation		PCD	Page
		DP150	
APDA-PB	**BAMPR-XAF**	●	E06
	BAMPR-XAW	●	
	BAMPR-XAWR	●	

Parts

Specification	Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for Cartridge
Ø3~Ø6	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available Inserts **E06**

APDA-PB

Blade

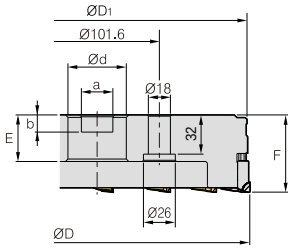


Fig. 3

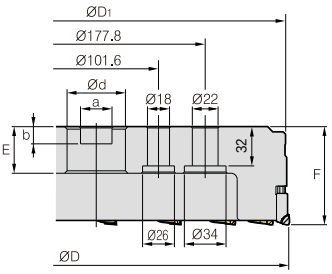


Fig. 4

AA 0°

- AR : -6°
- RR : -39°~-16°

(inch)

Designation		MAX	ØD	ØD1	Ød	a	b	E	F	ap	lbs	Fig.
APDA-PB	**800R-PB12Z**	12	26	8	7.882	2.50	1	0.551	1.575	2.5	0.196	9.9	3
	1000R-PB16Z	16	32	10	9.882	2.50	1	0.551	1.575	2.5	0.196	15.2	3
	1200R-PB18Z	18	42	12	11.88	2.50	1	0.551	1.575	2.5	0.196	22.1	4

Available Blades

BAMPR-XAF

BAMPR-XAW

BAMPR-XAWR

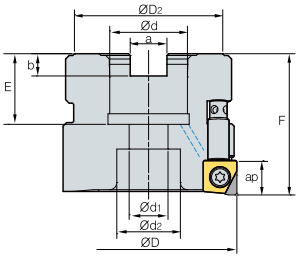
Designation		PCD	Page
		DP150	
BAMPR	**XAF**	●	E06
	XAW	●	
	XAWR	●	

Parts

Specification	 Blade screw	 Blade adjustable screw	 Al-body protecting tap	 Balancing screw	 Wrench for insert	 Wrench for cartridge
Ø8~Ø12	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available Inserts **E06**

MAPDA000HR/L-Z0 New



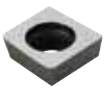
※ PCD ap : 0.236inch
※ Uncoated carbide ap : 0.354inch

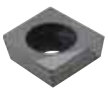
AA 0°
• AR : 6°
• RR : -1°~12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	Max rpm	lbs
MAPDA	**150HR/L-Z4**	4	1.5	1.417	0.50	0.252	0.169	0.630	1.50	0.287	0.433	0.354	24,000	0.24
	200HR/L-Z5	5	2.0	1.772	0.75	0.321	0.220	0.787	1.75	0.433	0.630	0.354	22,000	0.35
	250HR/L-Z6	6	2.5	1.772	0.75	0.321	0.220	0.787	1.75	0.551	0.826	0.354	20,000	0.65

Available Inserts


SNEW


SNEW-XAF


Strengthened Edge
SNEW-NAF

Designation		Cermet			Uncoated				PCD	Page
		CN2000	CN20	CN30	H01	G10	ST30A	ST20	DP200	
SNEW	**09T3ADFR**				●					E18
	09T3ADTR-XAF								●	
	09T3ADTR-NAF								●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
Aluminum	3,300 ~ 13,200 1,650 ~ 8,250	0.002 ~ 0.012 0.002 ~ 0.008	**DP200** **H01**

Coolant Bolt (Not included)

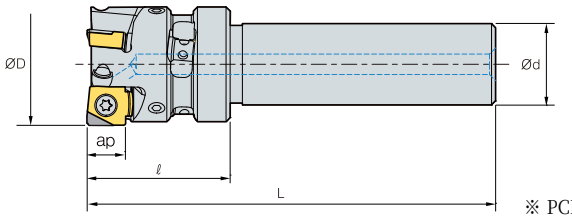
Designation	Applicable cutter	Available Cutters
CB0525	**MAPD040HR/L-Z4**	Ø40
CB1025	**MAPD050HR/L-Z5** **MAPD063HR/L-Z6**	Ø50 Ø63

Parts

Specification	Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
Ø1.5~Ø2.5	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available Inserts E18

MAPDSA000HR/L-Z0 Neu



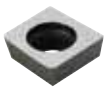
※ PCD ap:0.236inch

AA 0°
• AR : 6°
• RR : -4°~1°

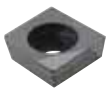
(inch)

Designation			ØD	Ød	ℓ	L	ap	Max rpm	lbs
MAPDSA	**125HR/L-Z3**	3	1.25	0.75	1.5	4	0.354	26,000	0.35
	150HR/L-Z4	4	1.5	0.75	1.5	4	0.354	24,500	0.42

Available Inserts



SNEW



SNEW-XAF

Strengthened Edge

SNEW-NAF

Designation		Cermet			Uncoated				PCD	Page
		CN2000	CN20	CN30	H01	G10	ST30A	ST20	DP200	
SNEW	**09T3ADFR**				●					E18
	09T3ADTR-XAF								●	
	09T3ADTR-NAF								●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
Aluminum	3,300 ~ 13,200 1,650 ~ 8,250	0.002 ~ 0.012 0.002 ~ 0.008	**DP200** **H01**

Parts

Specification	Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
Ø1.25~Ø1.5	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

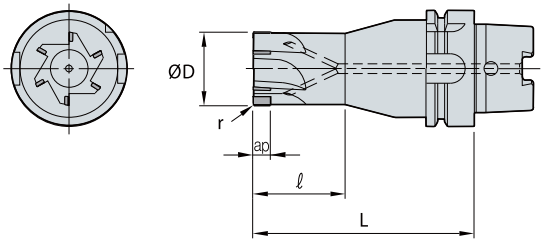
Available Inserts **E18**

Code system

PDFA 6 2500 – HSK63A

- PDFA: PDF FACE CUTTER
- 6: Tooth
- 2500: Diameter
- HSK63A: Shank

PCD FACE CUTTER



AA 0°
- AR : 6°
- RR : 5°~9°

(inch)

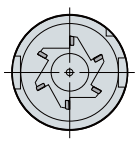
	Designation	Stock	◎	ØD	r	ap	ℓ	L
PDFA	41250-HSK50A		4	1.250	0.02	0.3	2.0	5.0
	41575-HSK50A		4	1.575	0.02	0.3	2.0	5.0
	41250-HSK63A		4	1.250	0.02	0.3	2.0	5.0
	41575-HSK63A		4	1.575	0.02	0.3	2.0	5.0
	42000-HSK63A		4	2.000	0.02	0.3	2.0	5.0
	62500-HSK63A		6	2.500	0.02	0.5	-	4.0
	62500-HSK100A		6	2.500	0.02	0.5	-	4.0

●Stock item

Recommended cutting condition

Workpiece	vc(sfm)	fz(ipt)	ap(inch)
Al, Brass, Alloy	655~6,550	0.001~0.004	0.002~0.157

Special PCD order sheet



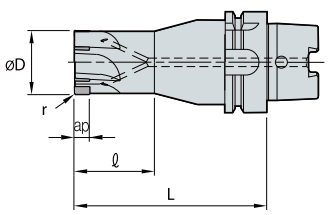


Fig. 1

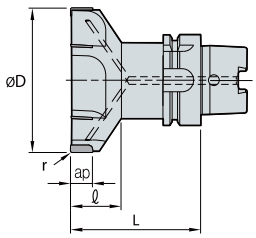


Fig. 2

Designation	Fig.	tooth	Dimensions(inch)					
			ØD	r	ap	ℓ	L	Shank spec.
PDFA								

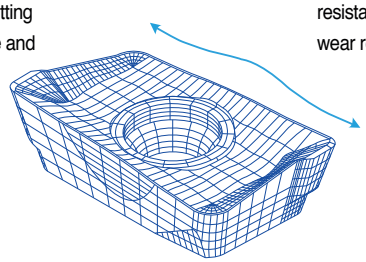
Various applications are available with multi-functional cutters

Alpha Mill

- Innovative curve cutting edge and chip-breaker design ensures ideal 90 degree cutting and lower cutting resistance
- Various applications are available with multi-functional cutters. (Facing, Slotting, Square shoulder milling and etc.)
- Improved insert life time with optimized with each application
- Excellent perfomance ensured at large depth of cut operations due to strong cutting edge and low cutting resistance

Alpha Mill Insert

▶ Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting edge

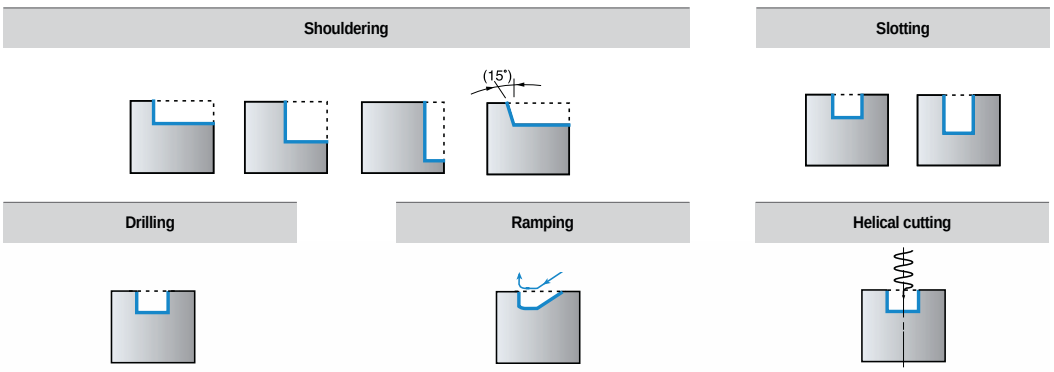


▶ Distinguished features of Alpha-Curve reduce cutting resistance and improve cutting edge strength and wear resistance

▶ Low cutting resistance is realized by KORLOY unique design i.e alpha curve cutting edge and optimal convex and concave design

▶ Highly efficient machining is available by the ideal application of the grade to material

Application example



Alpha Mill APMT-MA, ML

Features

▶ MA : Sharp edge and buffed surface for aluminum machining improve lubrication.

▶ ML : Cutting edge and grades for hard-to-cut materials(Ti, STS, Inconel) ensure superb performance in machining.

Features of Chip breakers

Type	Chip breaker	Cutting edge	Features
Al	MA		Optimal cutting edge and buffed surface for aluminum machining ensure high performance in machining.
Hard-to-cut material	ML		Chip breaker with low cutting load is optimal for machining hard-to-cut materials.

Type	Chip breaker	Cutting edge	Features
Light cutting	MF		Chip breaker with low cutting load and harder cutting edge than ML's are optimal for light cutting.
General cutting	MM		Optimal for milling in general ranges

Product constitution

Item description	Type	Nose R	MA	ML
APMT	1000Type	0.016	APMT0602PDFR-MA	-
		0.031	APMT060208PDFR-MA	-
	1500Type	0.016	APMT0903PDFR-MA	APMT0903PDER-ML
		0.031	APMT090308PDFR-MA	APMT090308PDER-ML
	2000Type	0.020	APMT11T3PDFR-MA	APMT11T3PDER-ML
		0.031	APMT11T308PDFR-MA	APMT11T308PDER-ML
	3000Type	0.016	APMT160404PDFR-MA	APMT160404PDER-ML
		0.031	APMT1604PDFR-MA	APMT1604PDER-ML
	4000Type	0.016	APMT180604PDFR-MA	APMT180604PDER-ML
		0.031	APMT1806PDFR-MA	APMT1806PDER-ML
		0.047	APMT180612PDFR-MA	APMT180612PDER-ML
		0.063	APMT180616PDFR-MA	APMT180616PDER-ML
		0.079	APMT180620PDFR-MA	APMT180620PDER-ML
		0.094	APMT180624PDFR-MA	APMT180624PDER-ML
		0.118	APMT180630R-MA	APMT180630R-ML

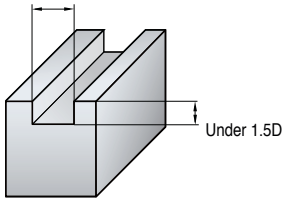
- The inserts can switch to the APMT type holders.

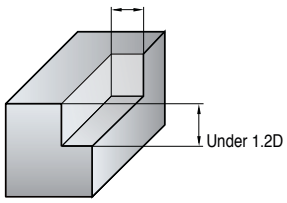
Recommended grades and chip breakers by workpiece

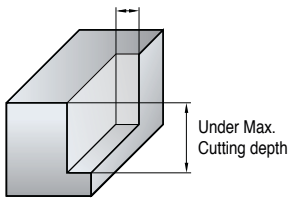
Chip breaker	Cutter edge	Recommended C/B and grade as per workpiece(●: 1st)											
		P				M		K		N		S	
		Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy		Ti/Inconel	
		C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
MA		-	-	-	-	-	-	-	-	●	●H01	-	-
ML		-	-	-	-	●	●PC5300 ○PC5400 ○PC3545 ○PC9530	-	-	-	-		●PC5300 ○PC5400 ○PC3545
MF		●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NCM335	-	○PC3500 ○PC3545 ○NCM325 ○NCM335	-	●PC5300 ○PC5400 ○PC3545 ○PC9530	-	●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400 ○PC3545
MM		-	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NCM335	●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NCM335	-	●PC5300 ○PC5400 ○PC3545 ○PC9530		●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400 ○PC3545

Recommended depth of cut

1. Slotting	2. Shouldering	3. Shouldering







Recommended cutting condition(for multi edge type)

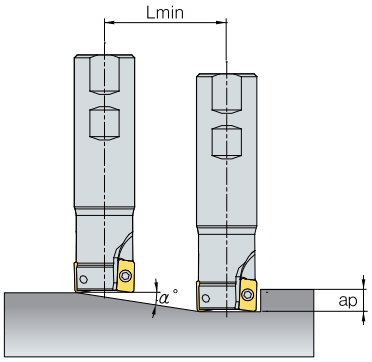
Workpiece	Grades	Fig.	Tool Dia.							
			Ø0.75, 1.0		Ø1.25, 1.5		Ø2.0, 2.5		Ø3.0, 4.0	
			vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)
Mild steel, Low carbon steel	NCM325 PC3500	①	260~330	0.002~0.003	330~390	0.002~0.003	330~390	0.002~0.003	330~390	0.002~0.003
		②	330~390	0.003~0.004	390~460	0.003~0.004	390~460	0.003~0.004	390~460	0.003~0.004
		③	330~390	0.004~0.006	390~460	0.004~0.006	390~460	0.004~0.006	430~490	0.004~0.006
High carbon steel, Alloy steel	NCM325 PC3500	①	200~260	0.002~0.002	260~330	0.002~0.002	260~330	0.002~0.002	260~330	0.002~0.002
		②	260~330	0.002~0.003	330~390	0.003~0.004	330~390	0.003~0.004	330~390	0.003~0.004
		③	260~330	0.004~0.006	360~430	0.004~0.006	330~430	0.004~0.006	360~430	0.004~0.006
Alloy tool steel	NCM325 PC3500	①	160~230	0.002~0.002	230~300	0.002~0.002	230~300	0.002~0.002	230~300	0.002~0.002
		②	200~260	0.002~0.003	300~390	0.002~0.003	330~390	0.002~0.003	330~390	0.002~0.003
		③	300~360	0.005~0.007	330~430	0.004~0.006	330~390	0.004~0.006	360~430	0.004~0.006
Stainless steel	PC5300 PC9530	①	160~230	0.002~0.002	230~300	0.002~0.002	230~300	0.002~0.002	230~300	0.002~0.002
		②	200~260	0.002~0.003	300~390	0.002~0.003	330~390	0.002~0.003	330~390	0.002~0.003
		③	300~360	0.004~0.006	330~430	0.004~0.006	360~430	0.004~0.006	360~430	0.004~0.006
Cast iron	PC6510 PC5300	①	230~300	0.004~0.005	230~300	0.004~0.005	300~390	0.004~0.005	300~390	0.004~0.005
		②	260~330	0.005~0.005	300~390	0.005~0.005	330~460	0.005~0.005	330~460	0.005~0.005
		③	260~330	0.006~0.008	330~430	0.006~0.008	390~490	0.006~0.008	390~490	0.006~0.008
Aluminum alloy	H01	①	660~2,620	0.004~0.008	980~2,950	0.004~0.008	1,310~3,280	0.004~0.008	1,310~3,280	0.004~0.008
		②	820~2,950	0.006~0.012	980~3,120	0.006~0.012	1,310~3,280	0.004~0.016	1,310~3,280	0.004~0.016
		③	820~2,950	0.006~0.012	980~3,120	0.006~0.012	1,310~3,280	0.004~0.016	1,310~3,280	0.004~0.016
Hardened steel	PC3545 PC5300	①	160~230	0.001~0.001	200~300	0.001~0.001	200~300	0.001~0.001	200~300	0.001~0.001
		②	200~260	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003
		③	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003

Recommended cutting condition(for single edge type)

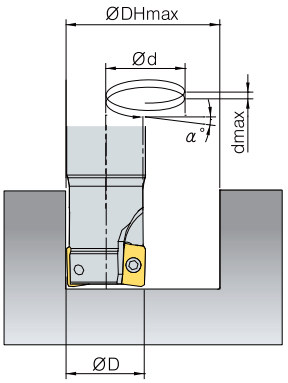
Workpiece	Grades	Fig.	Tool Dia.							
			Ø0.75, 1.0		Ø1.25, 1.5		Ø2.0, 2.5		Ø3.0, 4.0	
			vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)
Mild steel, Low carbon steel	NCM325 PC3500	①	200~260	0.002~0.003	260~390	0.002~0.003	390~660	0.002~0.003	490~660	0.002~0.003
		②	260~390	0.003~0.004	390~590	0.003~0.004	590~820	0.003~0.004	660~820	0.003~0.004
		③	260~390	0.004~0.006	390~590	0.004~0.006	590~820	0.004~0.006	660~820	0.004~0.006
High carbon steel, Alloy steel	NCM325 PC3500	①	160~260	0.002~0.002	260~360	0.002~0.002	330~490	0.002~0.002	330~490	0.002~0.002
		②	260~330	0.002~0.003	360~490	0.002~0.004	490~660	0.002~0.004	490~660	0.002~0.004
		③	260~330	0.004~0.006	390~490	0.004~0.006	590~660	0.004~0.006	590~660	0.004~0.006
Alloy tool steel	NCM325 PC3500	①	160~230	0.002~0.002	260~330	0.002~0.002	330~430	0.002~0.002	330~430	0.002~0.002
		②	230~330	0.002~0.003	330~430	0.002~0.004	430~590	0.002~0.004	430~590	0.002~0.004
		③	230~330	0.004~0.006	330~490	0.004~0.006	430~590	0.004~0.006	430~590	0.004~0.006
Stainless steel	PC5300 PC9530	①	160~230	0.002~0.002	260~330	0.002~0.002	330~430	0.002~0.002	330~430	0.002~0.002
		②	230~330	0.002~0.003	330~430	0.002~0.004	430~590	0.002~0.004	430~590	0.002~0.004
		③	230~330	0.004~0.006	330~490	0.004~0.006	430~590	0.004~0.006	430~590	0.004~0.006
Cast iron	PC6510 PC5300	①	260~330	0.003~0.005	260~330	0.006~0.006	390~490	0.006~0.006	390~490	0.006~0.006
		②	330~390	0.005~0.006	330~430	0.006~0.007	490~660	0.006~0.007	490~660	0.006~0.007
		③	330~390	0.006~0.008	330~430	0.006~0.008	490~660	0.006~0.008	490~660	0.006~0.008
Aluminum alloy	H01	①	820~2,620	0.006~0.008	980~2,950	0.006~0.008	1,310~3,280	0.004~0.008	1,310~3,280	0.004~0.008
		②	820~2,950	0.008~0.010	1,150~3,120	0.008~0.010	1,310~3,280	0.008~0.012	1,310~3,280	0.008~0.012
		③	820~2,950	0.010~0.012	1,150~3,120	0.010~0.012	1,310~3,280	0.012~0.016	1,310~3,280	0.012~0.016
Hardened steel	PC3545 PC5300	①	160~230	0.001~0.001	200~300	0.001~0.001	200~300	0.001~0.001	200~300	0.001~0.001
		②	200~260	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003
		③	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003	260~330	0.002~0.003

Cutting condition for ramping and helical operation

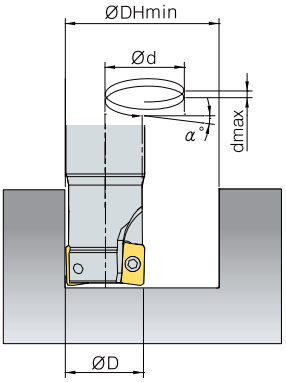
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole

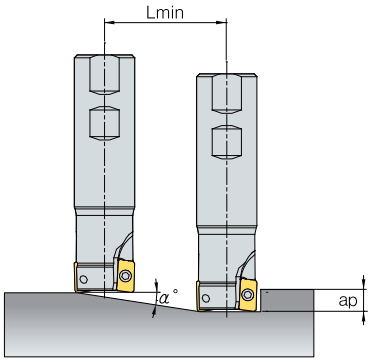


Designation		Tool Dia. ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
			ap	Maximum angle α(°)	Lmin(inch)	Max. desirable hole Dia. ØDHmax(inch)	Max. pitch dmax(inch)	Min. desirable hole Dia. ØDHmin(inch)	Max. pitch dmax(inch)	Min. desirable hole Dia. ØDHmin(inch)	Max. pitch dmax(inch)
AMSA	1043HS	0.438	0.220	5.50	2.045	0.828	0.080	0.781	0.075	0.599	0.058
	1050HS	0.500	0.220	4.52	2.492	0.953	0.075	0.906	0.072	0.724	0.057
	1056HS	0.563	0.220	3.83	2.938	1.078	0.072	1.031	0.069	0.849	0.057
	1062HS	0.625	0.220	3.33	3.384	1.203	0.070	1.156	0.067	0.974	0.057
	1068HS	0.688	0.220	2.94	3.831	1.328	0.068	1.281	0.066	1.099	0.056
	1075HS	0.750	0.220	2.64	4.277	1.453	0.067	1.406	0.065	1.224	0.056
	1081HS	0.813	0.220	2.39	4.724	1.578	0.066	1.531	0.064	1.349	0.056
	1087HS	0.875	0.220	2.18	5.170	1.703	0.065	1.656	0.063	1.474	0.056
	1100HS	1.000	0.220	1.86	6.063	1.953	0.063	1.906	0.062	1.724	0.056
	1106HS	1.063	0.220	1.73	6.509	2.078	0.063	2.031	0.061	1.849	0.056
	1125HS	1.250	0.220	1.44	7.849	2.453	0.062	2.406	0.060	2.224	0.056
	1131HS	1.313	0.220	1.36	8.295	2.578	0.061	2.531	0.060	2.349	0.056
AMCA	1150HS	1.500	0.220	1.17	9.634	2.953	0.060	2.906	0.059	2.724	0.056
	1200HS	2.000	0.220	0.85	13.206	3.953	0.059	3.906	0.058	3.724	0.056
	1250HS	2.500	0.220	0.67	16.777	4.953	0.058	4.906	0.058	4.724	0.055
AMSA	15050HS	0.500	0.354	5.93	3.410	0.953	0.099	0.898	0.093	0.646	0.067
	15056HS	0.563	0.354	6.05	3.342	1.078	0.114	1.023	0.108	0.771	0.082
	15062HS	0.625	0.354	5.10	3.967	1.203	0.107	1.148	0.103	0.896	0.080
	15068HS	0.688	0.354	4.41	4.592	1.328	0.102	1.273	0.098	1.021	0.079
	15075HS	0.750	0.354	3.89	5.217	1.453	0.099	1.398	0.095	1.146	0.078
	15081HS	0.813	0.354	3.47	5.842	1.578	0.096	1.523	0.092	1.271	0.077
	15087HS	0.875	0.354	3.14	6.467	1.703	0.093	1.648	0.090	1.396	0.076
	15093HS	0.938	0.354	2.86	7.092	1.828	0.091	1.773	0.089	1.521	0.076
	15100HS	1.000	0.354	2.63	7.717	1.953	0.090	1.898	0.087	1.646	0.076
	15112HS	1.125	0.354	2.26	8.967	2.203	0.087	2.148	0.085	1.896	0.075
	15118HS	1.188	0.354	2.12	9.592	2.328	0.086	2.273	0.084	2.021	0.075
	15125HS	1.250	0.354	1.99	10.217	2.453	0.085	2.398	0.083	2.146	0.074
	15137HS	1.375	0.354	1.77	11.467	2.703	0.084	2.648	0.082	2.396	0.074
AMCA	15150HS	1.500	0.354	1.60	12.717	2.953	0.082	2.898	0.081	2.646	0.074
	15200HS	2.000	0.354	1.15	17.717	3.953	0.079	3.898	0.078	3.646	0.073
	15250HS	2.500	0.354	0.89	22.717	4.953	0.077	4.898	0.076	4.646	0.072
	15300HS	3.000	0.354	0.73	27.717	5.953	0.076	5.898	0.075	5.646	0.072
	15400HS	4.000	0.354	0.54	37.717	7.953	0.075	7.898	0.074	7.646	0.072

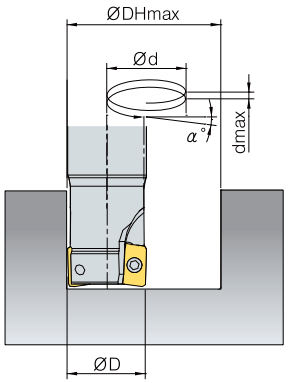
$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

Cutting condition for ramping and helical operation

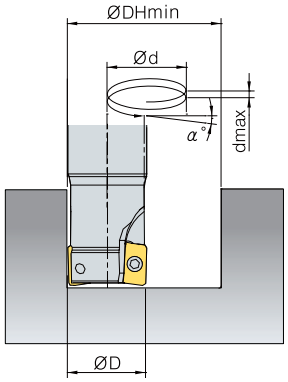
1. Ramping



2. Helical cutting for blind hole



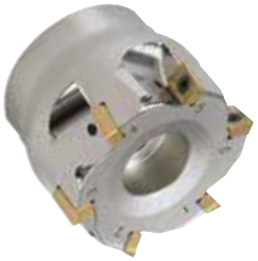
3. Helical cutting for through hole

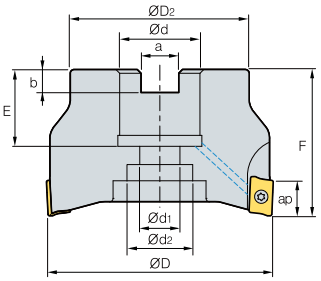


Designation		Tool Dia. ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
			ap	Maximum angle α(°)	Lmin(sfm)	Max. desirable hole Dia. ØDHmax(inch)	Max. pitch dmax(inch)	Min. desirable hole Dia. ØDHmin(inch)	Max. pitch dmax(inch)	Min. desirable hole Dia. ØDHmin(inch)	Max. pitch dmax(inch)
AMSA	2050HS	0.500	0.433	11.69	1.903	0.921	0.191	0.858	0.178	0.646	0.134
	2056HS	0.563	0.433	7.55	2.969	1.046	0.139	0.983	0.130	0.771	0.102
	2063HS	0.625	0.433	10.30	2.165	1.171	0.213	1.093	0.199	0.896	0.163
	2069HS	0.688	0.433	8.23	2.723	1.296	0.187	1.218	0.176	1.021	0.148
	2075HS	0.750	0.433	5.60	4.016	1.421	0.139	1.343	0.132	1.146	0.112
	2088HS	0.875	0.433	5.15	4.366	1.671	0.151	1.593	0.144	1.396	0.126
	2100HS	1.000	0.433	3.92	5.748	1.921	0.132	1.843	0.126	1.646	0.113
	2125HS	1.250	0.433	2.70	8.346	2.421	0.114	2.343	0.110	2.146	0.101
	2150HS	1.500	0.433	1.98	11.378	2.921	0.101	2.843	0.098	2.646	0.092
	2200HS	2.000	0.433	1.48	15.197	3.921	0.102	3.843	0.100	3.646	0.094
	2250HS	2.500	0.433	1.11	20.236	4.921	0.096	4.843	0.094	4.646	0.090
AMCA	2150HS	1.500	0.433	0.36	62.047	2.921	0.019	2.843	0.018	2.646	0.017
	2200HS	2.000	0.433	0.36	62.047	3.921	0.025	3.843	0.024	3.646	0.023
	2250HS	2.500	0.433	0.27	82.835	4.921	0.023	4.843	0.023	4.646	0.022
	2300HS	3.000	0.433	0.21	109.606	5.921	0.021	5.843	0.021	5.646	0.020
	2400HS	4.000	0.433	0.16	141.102	7.921	0.022	7.843	0.022	7.646	0.021
AMSA	3100HS	1.000	0.63	4.72	4.764	1.921	0.159	1.843	0.152	1.449	0.120
	3125HS	1.250	0.63	3.00	7.520	2.421	0.127	2.343	0.123	1.949	0.102
	3150HS	1.500	0.63	2.29	9.843	2.921	0.117	2.843	0.114	2.449	0.098
	3200HS	2.000	0.63	1.64	13.780	3.921	0.112	3.843	0.110	3.449	0.099
	3250HS	2.500	0.63	1.22	18.504	4.921	0.105	4.843	0.103	4.449	0.095
AMCA	3150HS	1.500	0.63	1.99	11.319	2.921	0.102	2.843	0.099	2.449	0.085
	3200HS	2.000	0.63	1.67	13.504	3.921	0.114	3.843	0.112	3.449	0.101
	3250HS	2.500	0.63	1.22	18.504	4.921	0.105	4.843	0.103	4.449	0.095
	3300HS	3.000	0.63	0.90	25.039	5.921	0.093	5.843	0.092	5.449	0.086
	3400HS	4.000	0.63	0.69	32.677	7.921	0.095	7.843	0.094	7.449	0.090
AMSA	2100MH	1.000	0.433	1.50	30.070	1.921	0.050	1.843	0.048	-	-
	2125MH	1.250	0.433	1.50	45.104	2.421	0.063	2.343	0.061	-	-
AMSA	3150MH	1.500	0.63	1.50	60.139	2.921	0.076	2.843	0.074	-	-
AMSA	4125HS	1.250	0.709	3.42	10.737	2.453	0.147	2.398	0.143	2.146	0.128
	4150HS	1.500	0.709	2.65	13.871	2.953	0.137	2.898	0.134	2.646	0.122
	4200HS	2.000	0.709	1.82	20.141	3.953	0.126	3.898	0.124	3.646	0.116
	4250HS	2.500	0.709	1.39	26.410	4.953	0.120	4.898	0.119	4.646	0.113
AMCA	4200HS	2.000	0.709	1.82	20.141	3.953	0.126	3.898	0.124	3.646	0.116
	4250HS	2.500	0.709	1.39	26.410	4.953	0.120	4.898	0.119	4.646	0.113
	4300HS	3.000	0.709	1.12	32.679	5.953	0.117	5.898	0.116	5.646	0.111
	4400HS	4.000	0.709	0.81	45.217	7.953	0.113	7.898	0.112	7.646	0.109
	4500HS	5.000	0.709	0.64	57.756	9.953	0.111	9.898	0.110	9.646	0.107

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

AMCA1000S





AA 0°

- AR : 9°~13°
- RR : -14°~5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	**1150HS**	10	1.500	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.220	0.53
	1200HS	12	2.000	1.772	0.750	0.433	0.630	0.321	0.220	0.787	1.750	0.220	0.79
	1250HS	14	2.500	1.772	0.750	0.433	0.630	0.321	0.220	0.787	1.750	0.220	1.34

Available Inserts

APMT-MA

APMT-MM

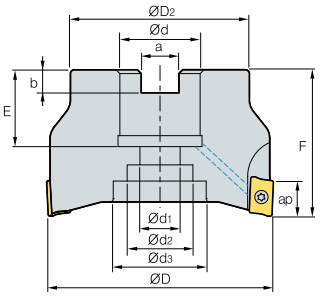
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**0602PDFR-MA**														●	E05
	060208PDFR-MA															
	060202PDSR-MM				●	●					●	●				
	0602PDSR-MM				●	●	●	●	●	●	●	●				
	060208PDSR-MM				●	●	●				●	●				
	060212R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTKA01842	TW06S-A

Available Inserts **E05**

AMCA1500S



AA 0°

- AR : 9° ~ 13°
- RR : -14° ~ 5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	15150HS	5	1.500	1.417	0.500	0.287	0.433	-	0.252	0.169	0.630	1.500	0.354	0.48
	15200HS	6	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.787	1.750	0.354	0.75
	15250HS	8	2.500	1.772	0.750	0.433	0.630	-	0.321	0.200	0.787	1.750	0.354	1.25
	15300HS	10	3.000	2.205	1.000	0.551	1.260	-	0.384	0.248	0.866	2.000	0.354	2.42
	15400HS	12	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.354	4.62

Available Inserts

APMT-MA

APMT-ML

APMT-MM

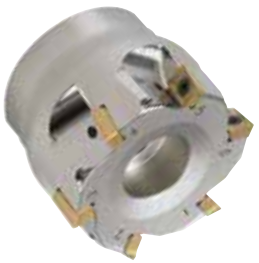
Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	0903PDFR-MA														●	E05
	090308PDFR-MA															
	0903PDER-ML										●	●				
	090308PDER-ML															
	0903PDSR-MM				●	●	●	●		●	●	●				
	090308PDSR-MM				●	●	●				●	●				
	090312R-MM						●				●	●				
	090316R-MM				●	●	●				●	●				
	090320R-MM					●	●				●	●				

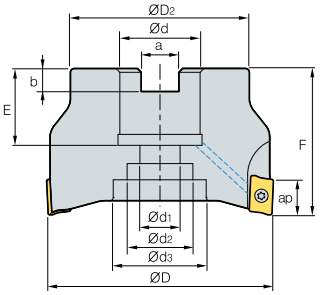
Parts

Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA02565S	TW08S

Available Inserts E05

AMCA2000S





AA 0°

- AR : 9°~13°
- RR : -14°~5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	2150HS	5	1.500	1.417	0.500	0.287	0.433	-	0.252	0.169	0.630	1.500	0.433	0.44
	2200HS	6	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.787	1.750	0.433	0.70
	2250HS	8	2.500	1.772	1.000	0.551	0.827	-	0.321	0.220	0.787	1.750	0.433	1.32
	2300HS	8	3.000	2.205	1.000	0.551	0.827	-	0.384	0.248	0.866	2.000	0.433	2.64
	2400HS	10	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.433	4.62

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

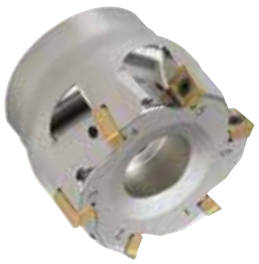
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	11T3PDFR-MA														●	E05 E06
	11T308PDFR-MA															
	11T3PDER-ML										●	●				
	11T308PDER-ML															
	11T3PDSR-MM			●	●	●	●	●	●	●	●	●				
	11T3PDSR-MF			●	●	●	●			●	●	●				
	11T308PDSR-MM			●	●	●	●		●		●	●				
	11T312PDSR-MM			●	●	●	●		●		●	●				
	11T316R-MM			●	●	●	●				●	●				
	11T318R-MM															
	11T324R-MM				●	●	●				●	●				

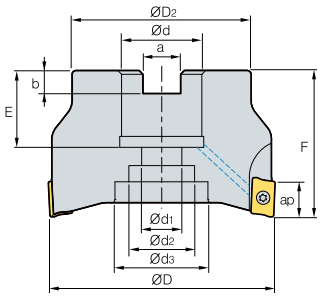
Parts

Specification	Screw	Wrench
Ø1.5~Ø4.00000	FTKA02565S	TW08S

Available Inserts **E05, E06**

AMCA3000S





AA 0°

- AR : 14°
- RR : -12°~8°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	3150HS	4	1.500	1.417	0.500	0.287	0.433	-	0.250	0.169	0.630	1.500	0.630	0.44
	3200HS	5	2.000	1.772	0.750	0.433	0.630	-	0.313	0.220	0.787	1.750	0.630	0.86
	3250HS	6	2.500	1.772	1.000	0.551	0.827	-	0.375	0.248	0.787	1.750	0.630	1.10
	3300HS	7	3.000	2.205	1.000	0.551	0.827	-	0.375	0.248	0.866	2.000	0.630	2.64
	3400HS	8	4.000	2.874	1.250	0.709	1.024	-	0.500	0.319	0.866	2.000	0.630	5.50

- It is recommended to use made to order holders in case of nose radius over R0.126

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

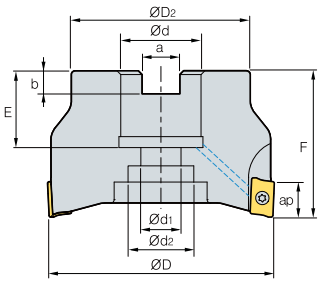
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1604PDFR-MA														●	E05 E06
	160404PDFR-MA															
	1604PDER-ML										●	●				
	160404PDER-ML															
	1604PDSR-MM			●	●	●	●	●	●	●	●	●				
	1604PDSR-MF			●	●	●	●			●	●	●				
	160410PDSR-MM			●			●				●	●				
	160416PDSR-MM			●	●	●	●				●	●				
	160424R-MM				●	●	●				●	●				
	160430R-MM						●				●	●				
	160432R-MM			●	●	●	●				●	●				
	160404PDSR-MM										●	●				
	160420R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA0410	TW15S

Available Inserts E05, E06

AMCA3000S-K



AA 0°

- AR : 14°
- RR : -12°~8°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCM	3150HS-K	4	1.500	1.417	0.500	0.287	0.433	0.250	0.169	0.630	1.500	0.630	0.44
	3200HS-K	5	2.000	1.772	0.750	0.416	0.630	0.313	0.200	0.787	1.750	0.630	0.66
	3250HS-K	6	2.500	1.772	1.000	0.551	0.827	0.375	0.248	0.787	1.750	0.630	1.10
	3300HS-K	7	3.000	2.205	1.000	0.551	0.827	0.375	0.248	0.866	2.000	0.630	2.64
	3400HS-K	8	4.000	2.874	1.250	-	1.772	0.500	0.319	0.866	2.000	0.630	5.50

- It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

Available Inserts

APFT-X22 APKT APKT-MF APKT-MM APKT-MM1 APKT-MA APKT-MA2 APKT-MA3 APKT-X22

Designation		Coated										Uncoated			page
		NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC8110	PD2000	ST30A	G10	H01	
APFT	1604PDSR-X22															E04
	1604PDTR-X22															
APKT	1604PDSR	●		●				●								E04 E05
	1604PDSR-MF	●							●		●					
	1604PDSR-MM	●	●	●		●	●	●	●		●					
	160432R-MM1	●														
	1604PDFR-MA											●			●	

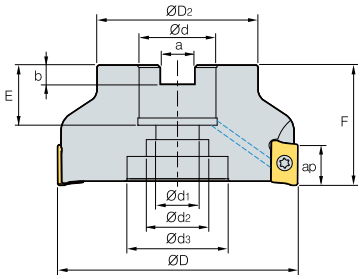
Designation		Coated										Uncoated			page
		NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC8110	PD2000	ST30A	G10	H01	
APKT	1604PDFR-MA2														●	E04
	160416FR-MA2															
	160432FR-MA2															
	1604PDFR-MA3													●	●	
	1604PDSR-X22															
	1604PDTR-X22															E05

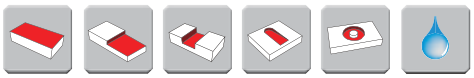
Parts

Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA0410	TW15S

Available Inserts E04, E05

AMCA4000S





AA 0°

- AR : 13°~15°
- RR : -12°~7°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	4200HS	5	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.827	1.750	0.669	0.62
	4250HS	6	2.500	1.772	0.750	0.433	0.630	-	0.321	0.220	0.827	1.750	0.669	1.10
	4300HS	7	3.000	2.205	1.000	0.551	0.827	-	0.384	0.248	0.866	2.000	0.669	2.20
	4400HS	8	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.669	3.74
	4500HS	9	5.000	3.386	1.500	0.827	1.141	1.969	0.636	0.394	1.181	2.500	0.669	7.26

- It is recommended to use made to order holders in case of nose radius over R0.126

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1806PDFR-MA															E05 E06
	180604PDFR-MA															
	180612PDFR-MA															
	180616PDFR-MA															
	180620PDFR-MA															
	180624PDFR-MA															
	180630R-MA															
	1806PDER-ML										●	●				
	180604PDER-ML											●				
	180612PDER-ML										●	●				
	180616PDER-ML										●	●				

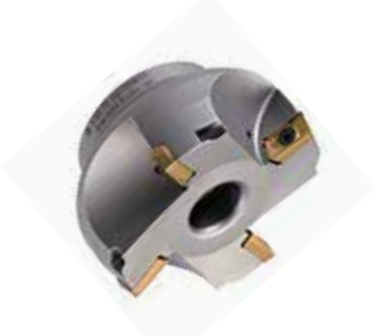
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	180620PDER-ML											●				E05 E06
	180624PDER-ML										●	●				
	180630R-ML										●	●				
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				
	1806PDSR-MF				●		●			●	●	●				
	180612PDSR-MM			●	●	●	●				●	●				
	180616PDSR-MM				●		●				●	●				
	180620PDSR-MM															
	180624PDSR-MM				●	●					●	●				
	180630R-MM						●				●	●				
	180632R-MM				●	●	●				●	●				

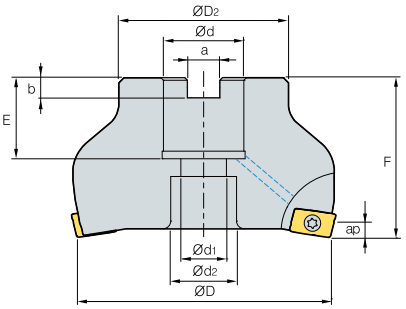
Parts

Specification	 Screw	 Wrench
Ø2.000~Ø5.000	FTKA0410	TW15S

Available Inserts E05, E06

AMCA1000SE / 2000SE





AA 15°

- AR : 45°
- RR : 0°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	**1150HSE**	4	1.500	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.098	0.57
	1200HSE	5	2.000	1.772	0.750	0.433	0.630	0.315	0.220	0.787	1.750	0.098	0.86
	2300HSE	5	3.000	2.205	1.000	0.551	0.827	0.374	0.236	0.866	2.000	0.157	2.65
	2400HSE	6	4.000	2.874	1.250	0.709	1.024	0.500	0.315	0.866	2.000	0.157	5.14

Available Inserts

APMT-MM

APMT-MF

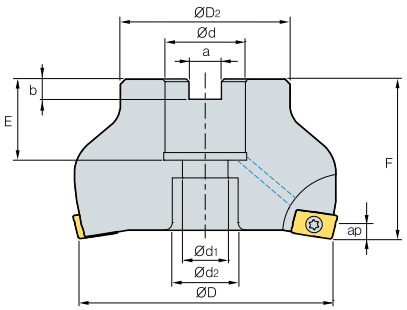
Type	Designation		Cermet		Coated									Uncoated			page
			CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	APMT	**060202PDSR-MM**				●	●					●	●				E05 E06
		0602PDSR-MM				●	●	●	●	●	●	●	●				
		060208PDSR-MM				●	●	●				●	●				
		060212R-MM				●	●	●				●	●				
2000 type	APMT	**11T3PDSR-MM**			●	●	●	●	●	●	●	●	●				
		11T3PDSR-MF			●	●	●	●				●	●				
		11T308PDSR-MM			●	●	●	●		●		●	●				
		11T312PDSR-MM			●	●	●	●		●		●	●				
		11T316R-MM			●	●	●	●				●	●				
		11T318R-MM															
		11T324R-MM				●	●	●				●	●				

Parts

Specification	 Screw	 Wrench	 Wrench
Ø1.500~Ø2.000 (1000type)	FTKA01842	-	TW06S-A
Ø3.000~Ø4.000 (2000type)	FTKA02565S	TW08S	-

Available Inserts **E05, E06**

AMCA3000SE



AA 15°

- AR : 45°
- RR : 0°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	3300HSE	4	3.000	2.205	1.000	0.551	0.827	0.374	0.236	0.866	2.000	0.236	2.87
	3400HSE	5	4.000	2.874	1.250	0.709	1.024	0.500	0.315	0.866	2.000	0.236	5.07

Available Inserts

APMT-MM

APMT-MF

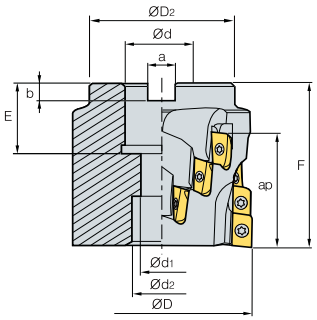
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1604PDSR-MM			●	●	●	●	●	●	●	●	●				E05 E06
	1604PDSR-MF			●	●	●	●			●	●	●				
	160410PDSR-MM			●			●				●	●				
	160416PDSR-MM			●	●	●	●				●	●				
	160424R-MM				●	●	●				●	●				
	160430R-MM						●				●	●				
	160432R-MM			●	●	●	●				●	●				
	160404PDSR-MM										●	●				
	160420R-MM										●					

Parts

Specification	Screw	Wrench
Ø3.000~Ø4.000	FTKA0410	TW08S

Available Inserts E05, E06

AMCA2000M



AA 0°

• AR : 9°
• RR : -9° ~ -5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	2200M	16	2.0	1.772	0.75	0.433	0.630	0.315	0.220	0.866	2.283	4	1.535	1.54
	2250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.248	0.944	2.283	4	1.535	1.76
	2300M	20	3.0	2.756	1.25	0.708	1.023	0.500	0.319	0.944	2.480	5	1.535	2.12
	2400M	24	4.0	3.386	1.50	1.260	1.969	0.626	0.394	1.181	2.480	6	1.535	2.65

Available Inserts

APMT-MA

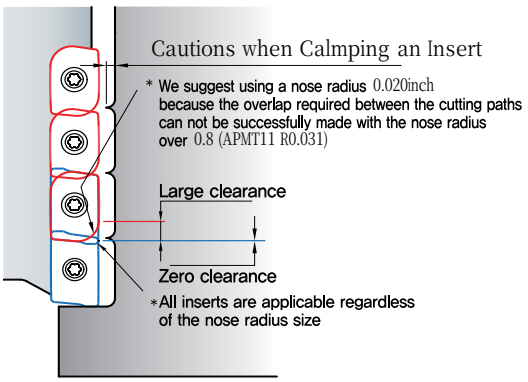
APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	11T3PDFR-MA														●	
	11T308PDFR-MA															
	11T3PDER-ML										●	●				
	11T308PDER-ML															
	11T3PDSR-MM			●	●	●	●	●	●	●	●	●				E05
	11T3PDSR-MF			●	●	●	●			●	●	●				E06
	11T308PDSR-MM			●	●	●	●		●		●	●				
	11T312PDSR-MM			●	●	●	●		●		●	●				
	11T316R-MM			●	●	●	●				●	●				
	11T318R-MM															
	11T324R-MM				●	●	●				●	●				

Caution when insert are screwed

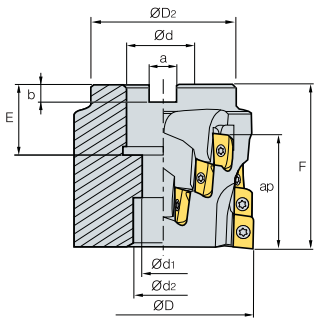


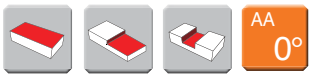
Parts

Specification	Screw	Wrench
Ø2.0~Ø4.0	FTKA02565S	TW08S

Available Inserts E05, E06

AMCA3000M





• AR : 9°
• RR : -9° ~ -5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	3250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.945	3.346	4	2.244	2.43
	3300M	20	3.0	2.205	1.25	0.709	1.024	0.500	0.315	1.690	3.937	4	2.795	4.92
	3400M	30	4.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	3.937	6	2.795	7.92

Available Inserts

APMT-MA

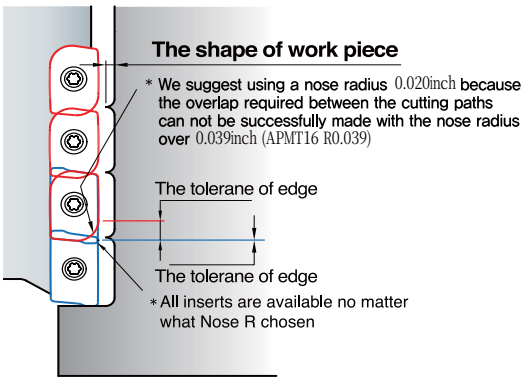
APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1604PDFR-MA														●	E05 E06
	160404PDFR-MA															
	1604PDER-ML										●	●				
	160404PDER-ML															
	1604PDSR-MM			●	●	●	●	●	●	●	●	●				
	1604PDSR-MF			●	●	●	●			●	●	●				
	160410PDSR-MM			●			●				●	●				
	160416PDSR-MM			●	●	●	●				●	●				
	160424R-MM				●	●	●				●	●				
	160430R-MM						●				●	●				
	160432R-MM			●	●	●	●				●	●				
	160404PDSR-MM										●	●				
	160420R-MM				●	●	●				●	●				

Caution when insert are screwed

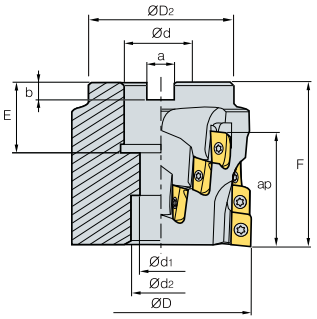


Parts

Specification	Screw	Wrench
Ø2.5~Ø4.0	FTKA0410	TW15S

Available Inserts E05, E06

AMCA4000M



AA 0°

- AR : 9°
- RR : -9° ~ -5°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	4250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.248	0.944	3.346	4	2.406	2.43
	4300M	20	3.0	2.756	1.25	0.709	1.024	0.500	0.315	0.944	3.937	4	2.996	4.92
	4400M	30	4.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	3.937	6	2.996	7.92
	4500M	18	5.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	2.677	6	1.815	8.82

Available Inserts

APMT-MA

APMT-ML

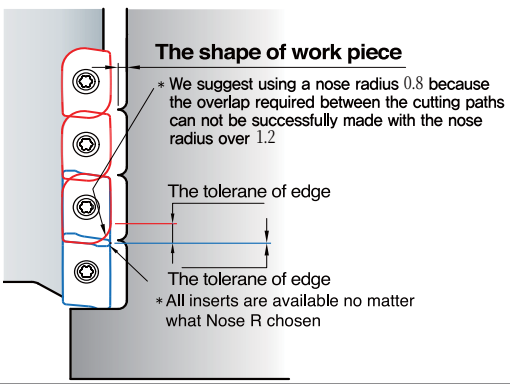
APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1806PDFR-MA															E05 E06
	180604PDFR-MA															
	180612PDFR-MA															
	180616PDFR-MA															
	180620PDFR-MA															
	180624PDFR-MA															
	180630R-MA															
	1806PDER-ML										●	●				
	180604PDER-ML											●				
	180612PDER-ML										●	●				
	180616PDER-ML										●	●				

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	180620PDER-ML											●				E05 E06
	180624PDER-ML										●	●				
	180630R-ML										●	●				
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				
	1806PDSR-MF				●		●			●	●	●				
	180612PDSR-MM			●	●	●	●				●	●				
	180616PDSR-MM				●		●				●	●				
	180620PDSR-MM															
	180624PDSR-MM				●	●					●	●				
	180630R-MM						●				●	●				
	180632R-MM				●	●	●				●	●				

Caution when insert are screwed



Parts

Specification	Screw	Wrench
Ø2.5~Ø5.0	FTKA0410	TW15S

Available Inserts E05, E06

AMSA1000S

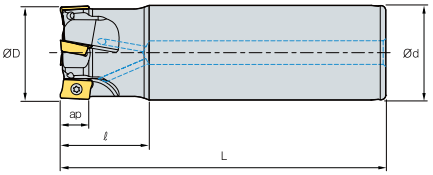


Fig. 1

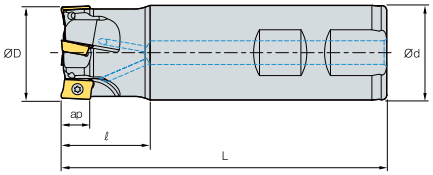


Fig. 2

AA 0°

- AR : 7.5°~13°
- RR : -17°~-6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	**1043HS**	2	0.438	0.375	0.787	3.150	0.22	0.09	2
	1050HS-2	2	0.500	0.500	0.984	3.150	0.22	0.12	2
	1050HS-2L050	2	0.500	0.500	0.984	4.724	0.22	0.20	1
	1050HS-3	3	0.500	0.500	0.984	3.150	0.22	0.12	2
	1056HS-2	2	0.563	0.625	0.984	3.543	0.22	0.24	2
	1056HS-2L062	2	0.563	0.625	0.984	5.512	0.22	0.40	1
	1056HS-3	3	0.563	0.625	0.984	3.543	0.22	0.24	2
	1062HS-3	3	0.625	0.625	0.984	3.543	0.22	0.26	2
	1062HS-3L062	3	0.625	0.625	0.984	6.299	0.22	0.49	1
	1062HS-4	4	0.625	0.625	0.984	3.543	0.22	0.26	2
	1068HS	4	0.688	0.625	0.984	3.543	0.22	0.26	2
	1068HS-3L062	3	0.688	0.625	0.984	6.299	0.22	0.49	1
	1075HS-4	4	0.750	0.750	1.181	4.331	0.22	0.51	2
	1075HS-4L075	4	0.750	0.750	1.181	7.874	0.22	0.95	1
	1075HS-5	5	0.750	0.750	1.181	4.331	0.22	0.51	2
	1081HS	5	0.813	0.750	1.181	4.331	0.22	0.53	2
	1081HS-4L075	4	0.813	0.750	1.181	7.874	0.22	0.95	1
	1087HS	5	0.875	0.750	1.181	4.331	0.22	0.60	2
	1100HS	7	1.000	1.000	1.181	4.724	0.22	0.86	2
	1106HS	7	1.063	1.000	1.181	4.724	0.22	0.86	2
	1125HS	8	1.250	1.250	1.378	4.724	0.22	1.43	2
	1131HS	8	1.313	1.250	1.378	4.724	0.22	1.43	2

Available Inserts

APMT-MA

APMT-MM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**0602PDFR-MA**														●	E05
	060208PDFR-MA															
	060202PDSR-MM				●	●					●	●				
	0602PDSR-MM				●	●	●	●	●	●	●	●				
	060208PDSR-MM				●	●	●				●	●				
	060212R-MM				●	●	●				●	●				
	060216R-MM					●	●				●	●				

Parts

Specification	Screw	Wrench
Ø0.438~Ø1.313	FTKA01842	TW06S-A

Available Inserts **E05**

AMSA1500S

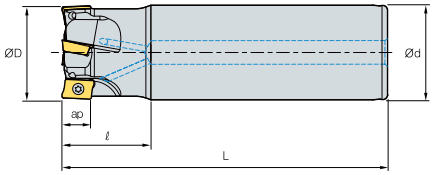


Fig. 1

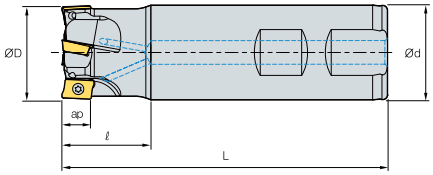


Fig. 2

- AR : 7.5°~12.5°
- RR : -28°~-14°

(inch)

Designation		⊙	ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	**15050HS**	1	0.500	0.625	0.984	3.150	0.354	0.21	2
	15050HS-1L062	1	0.500	0.625	1.181	6.299	0.354	0.46	1
	15056HS	1	0.563	0.625	0.984	3.150	0.354	0.22	2
	15056HS-1L062	1	0.563	0.625	1.181	6.299	0.354	0.46	1
	15062HS	2	0.625	0.625	1.181	3.543	0.354	0.24	2
	15062HS-2L062	2	0.625	0.625	1.181	6.299	0.354	0.46	1
	15068HS	2	0.688	0.625	1.181	3.543	0.354	0.27	2
	15068HS-2L062	2	0.688	0.625	1.181	6.299	0.354	0.46	1
	15075HS	2	0.750	0.750	1.181	3.543	0.354	0.40	2
	15075HS-2L075	2	0.750	0.750	1.181	6.299	0.354	0.75	1
	15075HS-3	3	0.750	0.750	1.181	3.543	0.354	0.40	2
	15081HS	2	0.813	0.750	1.181	3.543	0.354	0.44	2
	15081HS-2L075	2	0.813	0.750	1.181	6.299	0.354	0.75	1
	15081HS-3	3	0.813	0.750	1.181	3.543	0.354	0.44	2
	15087HS	3	0.875	0.750	1.181	4.331	0.354	0.51	2
	15087HS-3L075	3	0.875	0.750	1.181	7.087	0.354	0.84	1
	15093HS	3	0.938	0.750	1.181	4.331	0.354	0.66	2
	15093HS-4	4	0.938	0.750	1.181	4.331	0.354	0.66	2
	15100HS-3S075	3	1.000	0.750	1.181	4.331	0.354	0.77	2
	15100HS	3	1.000	1.000	1.181	4.331	0.354	0.77	2
	15100HS-3L100	3	1.000	1.000	1.181	7.087	0.354	1.30	2
	15100HS-4S075	4	1.000	0.750	1.181	4.331	0.354	0.55	1
	15100HS-4S100	4	1.000	1.000	1.181	4.331	0.354	0.55	2

Available Inserts

APMT-MA

APMT-ML

APMT-MM

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**0903PDFR-MA**														●	E05
	090308PDFR-MA															
	0903PDER-ML										●	●				
	090308PDER-ML															
	0903PDSR-MM				●	●	●	●		●	●	●				
	090308PDSR-MM				●	●	●				●	●				
	090312R-MM						●				●	●				
	090316R-MM				●	●	●				●	●				
	090320R-MM					●	●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø0.500~Ø1.000	FTKA02555S FTKA02565S	TW08S	Ø0.500~Ø0.563 Ø0.625~Ø1.500

Available Inserts **E05**

AMSA1500S

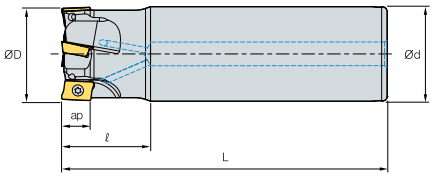


Fig. 1

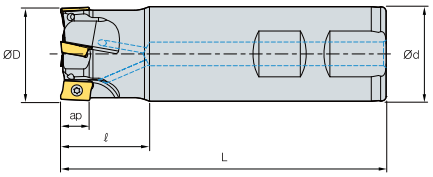


Fig. 2

- AR : 7.5°~12.5°
- RR : -28°~-14°

(inch)

Designation		⦾	ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	**15100HS-3L100**	3	1.000	1.000	1.181	7.087	0.354	1.30	1
	15100HS-4S075	4	1.000	0.750	1.181	4.331	0.354	0.55	2
	15100HS-4S100	4	1.000	1.000	1.181	4.331	0.354	0.55	2
	15112HS	4	1.125	1.000	1.181	4.331	0.354	0.79	2
	15112HS-4L100	4	1.125	1.000	1.181	7.087	0.354	1.35	1
	15112HS-5	5	1.125	1.000	1.181	4.331	0.354	0.79	2
	15118HS	4	1.188	1.000	1.181	4.331	0.354	0.84	2
	15118HS-4L100	4	1.188	1.000	1.181	7.087	0.354	1.37	1
	15118HS-5	5	1.188	1.000	1.181	4.331	0.354	0.84	2
	15125HS	4	1.250	1.250	1.181	4.331	0.354	1.32	2
	15125HS-4L125	4	1.250	1.250	1.181	7.087	0.354	2.21	1
	15125HS-5	5	1.250	1.250	1.181	4.331	0.354	1.32	2
	15137HS	5	1.375	1.250	1.181	4.331	0.354	1.54	2
	15137HS-6	6	1.375	1.250	1.181	4.331	0.354	1.54	2
	15150HS-S125	5	1.500	1.250	1.378	5.118	0.354	1.76	2
	15150HS-5L125	5	1.500	1.250	1.378	7.874	0.354	2.65	1
	15150HS-6S125	6	1.500	1.250	1.378	5.118	0.354	1.76	2
	15150HS-S150	5	1.500	1.500	1.378	5.118	0.354	2.49	2
	15150HS-6S150	6	1.500	1.500	1.378	5.118	0.354	2.49	2

Available Inserts

APMT-MA

APMT-ML

APMT-MM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC8510	PC5300	PC5400	ST30A	G10	H01	
APMT	**0903PDFR-MA**														●	E05
	090308PDFR-MA															
	0903PDER-ML										●	●				
	090308PDER-ML															
	0903PDSR-MM				●	●	●	●		●	●	●				
	090308PDSR-MM				●	●	●				●	●				
	090312R-MM						●				●	●				
	090316R-MM				●	●	●				●	●				
	090320R-MM					●	●				●	●				

Parts

Specification	 Screw	 Wrench
Ø1.000~Ø1.500	FTKA02565S	TW08S

Available Inserts **E05**

AMSA2000S

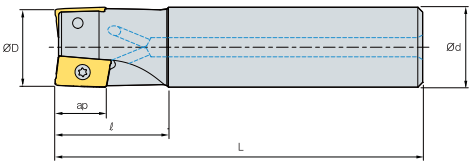


Fig. 1

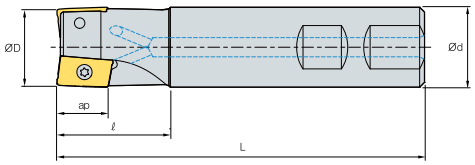


Fig. 2

AA 0°

- AR : 3° ~ 14°
- RR : -25° ~ -18°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	**2050HS**	1	0.500	0.625	0.984	3.346	0.433	0.22	2
	2050HS-1L062	1	0.500	0.625	1.181	6.299	0.433	0.46	1
	2056HS	1	0.563	0.625	0.984	3.543	0.433	0.26	2
	2056HS-1L062	1	0.563	0.625	1.181	6.299	0.433	0.46	1
	2062HS	2	0.625	0.625	0.984	3.543	0.433	0.26	2
	2062HS-2L062	2	0.625	0.625	1.181	7.087	0.433	0.46	1
	2068HS	2	0.688	0.625	0.984	3.543	0.433	0.26	2
	2068HS-2L062	2	0.688	0.625	1.181	7.087	0.433	0.46	1
	2075HS	2	0.750	0.750	1.181	3.937	0.433	0.46	2
	2075HS-2L075	2	0.750	0.750	1.181	8.268	0.433	0.75	1
	2087HS	3	0.875	0.750	1.378	4.528	0.433	0.55	2
	2087HS-3L075	3	0.875	0.750	1.378	7.087	0.433	0.84	1
	2100HS	3	1.000	1.000	1.378	4.528	0.433	0.88	2
	2100HS-3L100	3	1.000	1.000	1.575	7.087	0.433	1.30	1
	2125HS	4	1.250	1.250	1.575	4.921	0.433	1.54	2
	2125HS-4L125	4	1.250	1.250	1.969	7.087	0.433	2.21	1
	2150HS	5	1.500	1.250	1.654	5.118	0.433	1.85	2
	2150HS-5L125	5	1.500	1.250	1.969	7.874	0.433	2.65	1
	2150HS-S150	5	1.500	1.500	1.654	5.118	0.433	2.54	2
	2200HS	6	2.000	1.250	1.772	5.315	0.433	2.34	2
	2200HS-S150	6	2.000	1.500	1.772	5.315	0.433	3.04	2
	2250HS	8	2.500	1.250	1.772	5.315	0.433	2.89	2
	2250HS-S150	8	2.500	1.500	1.772	5.315	0.433	3.57	2

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**11T3PDFR-MA**														●	E05 E06
	11T308PDFR-MA															
	11T3PDER-ML										●	●				
	11T308PDER-ML															
	11T3PDSR-MM			●	●	●	●	●	●	●	●	●				
	11T3PDSR-MF			●	●	●	●			●	●	●				
	11T308PDSR-MM			●	●	●	●		●		●	●				
	11T312PDSR-MM			●	●	●	●		●		●	●				
	11T316R-MM			●	●	●	●				●	●				
	11T318R-MM															
	11T324R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø0.500~Ø2.500	FTKA02555S FTKA02565S	TW08S	Ø0.500~Ø0.563 Ø0.625~Ø2.500

Available Inserts **E05, E06**

AMSA3000S

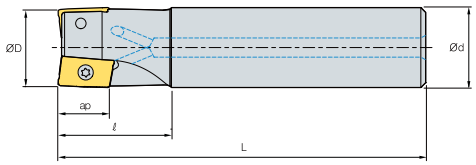


Fig. 1

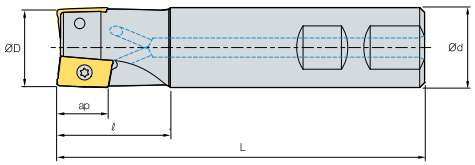
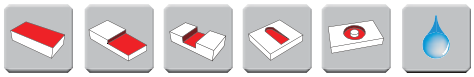


Fig. 2



AA 0°

- AR : 3°~14°
- RR : -18°~-10°

(inch)

Designation		⦶	ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	3100HS	2	1.000	1.000	1.378	4.528	0.630	0.88	2
	3100HS-2M100	2	1.000	1.000	1.378	7.087	0.630	1.43	1
	3100HS-2L100	2	1.000	1.000	2.362	8.661	0.630	1.65	1
	3125HS	3	1.250	1.250	1.575	4.921	0.630	1.52	2
	3125HS-2M125	2	1.250	1.250	1.575	7.874	0.630	2.49	1
	3125HS-2L125	2	1.250	1.250	2.559	10.236	0.630	3.35	1
	3125HS-3M125	3	1.250	1.250	1.575	7.874	0.630	2.47	1
	3125HS-3L125	3	1.250	1.250	2.559	10.236	0.630	3.26	1
	3150HS	4	1.500	1.250	1.654	5.118	0.630	1.76	2
	3150HS-3M125	3	1.500	1.250	1.654	7.874	0.630	2.73	1
	3150HS-3L125	3	1.500	1.250	1.654	10.236	0.630	3.55	1
	3150HS-4M125	4	1.500	1.250	1.654	7.874	0.630	2.67	1
	3150HS-4L125	4	1.500	1.250	1.654	10.236	0.630	3.48	1
	3150HS-S150	4	1.500	1.500	1.654	5.118	0.630	2.43	2
	3200HS	5	2.000	1.250	1.772	5.315	0.630	2.21	2
	3200HS-S150	5	2.000	1.500	1.772	5.315	0.630	2.87	2
	3250HS	6	2.500	1.250	1.772	5.315	0.630	2.76	2
	3250HS-S150	6	2.500	1.500	1.772	5.315	0.630	3.31	2

• It is recommended to use made to order holders in case of nose radius over R0.126

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

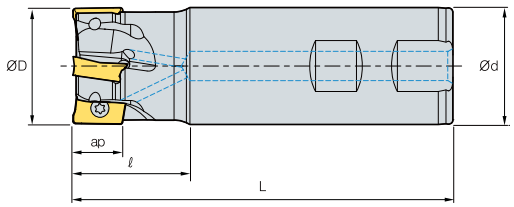
Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1604PDFR-MA														●	E05 E06
	160404PDFR-MA															
	1604PDER-ML										●	●				
	160404PDER-ML															
	1604PDSR-MM			●	●	●	●	●	●	●	●	●				
	1604PDSR-MF			●	●	●	●			●	●	●				
	160410PDSR-MM			●			●				●	●				
	160416PDSR-MM			●	●	●	●				●	●				
	160424R-MM				●	●	●				●	●				
	160430R-MM						●				●	●				
	160432R-MM			●	●	●	●				●	●				
	160404PDSR-MM										●	●				
	160420R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.000~Ø2.500	FTKA0408 FTKA0410	TW15S	Ø1.000 Ø1.250~Ø2.500

Available Inserts **E05, E06**

AMSA3000S-K



AA 0°

- AR : 14°
- RR : -18°~-10°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
AMSA	**3100HS-K**	2	1.000	1.000	1.378	4.528	0.630	0.88
	3125HS-K	3	1.250	1.250	1.575	4.921	0.630	1.52
	3150HS-K	4	1.500	1.250	1.654	5.118	0.630	1.76
	3150HS-K-150	4	1.500	1.500	1.654	5.118	0.630	2.43
	3200HS-K	5	2.000	1.250	1.772	5.315	0.630	2.21
	3200HS-K-150	5	2.000	1.500	1.772	5.315	0.630	2.87
	3250HS-K	6	2.500	1.250	1.772	5.315	0.630	2.76
	3250HS-K-150	6	2.500	1.500	1.772	5.315	0.630	3.31

Available Inserts

APFT-X22 APFT-X28 APKT APKT-MF APKT-MM APKT-MM1 APKT-MA APKT-MA2 APKT-MA3 APKT-X22 APKT-X23 APKT-X24

Designation		Coated										Uncoated			page
		NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	PC8110	PD2000	ST30A	G10	H01	
APMT	**1604PDSR-X22**															E04
	1604PDTR-X22															
APKT	**1604PDSR**	●		●				●								E04 E05
	1604PDSR-MF	●							●		●					
	1604PDSR-MM	●	●	●		●	●	●	●		●					
	160432R-MM1	●														
	1604PDFR-MA											●			●	
	1604PDFR-MA2														●	
	160416FR-MA2															
	160432FR-MA2															
	1604PDFR-MA3													●	●	
	1604PDSR-X22															
	1604PDTR-X22															

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.000~Ø2.500	FTKA0408 FTKA0410	TW15S	Ø1.000 Ø1.250~Ø2.500

Available Inserts **E04, E05**

AMSA4000S

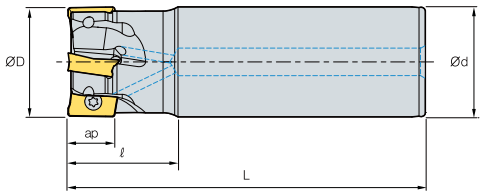


Fig. 1

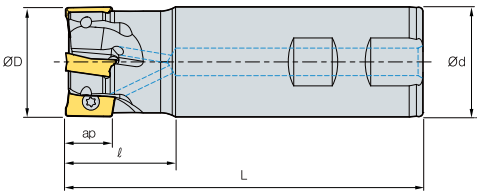


Fig. 2

AA 0°

- AR : 7°~13°
- RR : -20°~-6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	**4100HS**	2	1.000	1.000	1.575	4.331	0.669	0.77	2
	4100HS-2M100	2	1.000	1.000	1.575	7.087	0.669	1.28	1
	4100HS-2L100	2	1.000	1.000	1.575	9.055	0.669	1.59	1
	4106HS	2	1.063	1.000	1.575	4.331	0.669	0.82	2
	4106HS-2M100	2	1.063	1.000	1.575	7.087	0.669	1.32	1
	4106HS-2L100	2	1.063	1.000	1.575	9.055	0.669	1.63	1
	4125HS	3	1.250	1.250	1.575	4.921	0.669	1.43	2
	4125HS-2M125	2	1.250	1.250	1.969	7.874	0.669	2.58	1
	4125HS-2L125	2	1.250	1.250	1.969	10.236	0.669	3.35	1
	4125HS-3M125	3	1.250	1.250	1.969	7.874	0.669	2.43	1
	4125HS-3L125	3	1.250	1.250	1.969	10.236	0.669	3.26	1
	4131HS	3	1.313	1.250	1.575	4.921	0.669	1.50	2
	4131HS-2M125	2	1.313	1.250	1.969	7.874	0.669	2.47	1
	4131HS-2L125	2	1.313	1.250	1.969	10.236	0.669	3.31	1
	4131HS-3M125	3	1.313	1.250	1.969	7.874	0.669	2.47	1
	4131HS-3L125	3	1.313	1.250	1.969	10.236	0.669	3.31	1

• It is recommended to use made to order holders in case of nose radius over R0.126

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**1806PDFR-MA**															E05 E06
	180604PDFR-MA															
	180612PDFR-MA															
	180616PDFR-MA															
	180620PDFR-MA															
	180624PDFR-MA															
	180630R-MA															
	1806PDER-ML										●	●				
	180604PDER-ML											●				
	180612PDER-ML										●	●				
	180616PDER-ML										●	●				

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**180620PDER-ML**											●				E05 E06
	180624PDER-ML										●	●				
	180630R-ML										●	●				
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				
	1806PDSR-MF				●		●			●	●	●				
	180612PDSR-MM			●	●	●	●				●	●				
	180616PDSR-MM				●		●				●	●				
	180620PDSR-MM															
	180624PDSR-MM				●	●					●	●				
	180630R-MM						●				●	●				
	180632R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.000~Ø1.313	FTKA0408 FTKA0410	TW15S	Ø1.000~Ø1.063 Ø1.250~Ø2.500

Available Inserts **E05, E06**

AMSA4000S

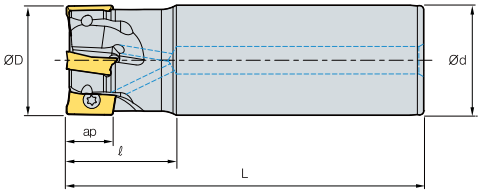


Fig. 1

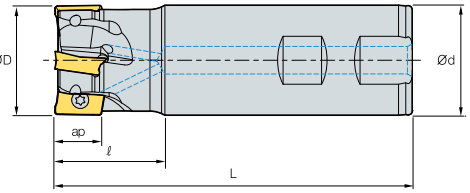


Fig. 2

AA 0°

- AR : 7° ~ 13°
- RR : -20° ~ -6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	4150HS-3M125	3	1.500	1.250	1.969	7.874	0.669	2.65	1
	4150HS-3L125	3	1.500	1.250	1.969	10.236	0.669	3.53	1
	4150HS-4M125	4	1.500	1.250	1.969	7.874	0.669	2.65	1
	4150HS-4L125	4	1.500	1.250	1.969	10.236	0.669	3.53	1
	4150HS-S125	4	1.500	1.250	1.575	5.118	0.669	1.68	2
	4150HS-S150	4	1.500	1.500	1.575	5.118	0.669	2.43	2
	4200HS-S125	5	2.000	1.250	1.575	5.315	0.669	2.09	2
	4200HS-S150	5	2.000	1.500	1.575	5.315	0.669	2.87	2
	4250HS-S125	6	2.500	1.250	1.575	5.315	0.669	2.76	2
	4250HS-S150	6	2.500	1.500	1.575	5.315	0.669	3.53	2

• It is recommended to use made to order holders in case of nose radius over R0.126

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	1806PDFR-MA															E05 E06
	180604PDFR-MA															
	180612PDFR-MA															
	180616PDFR-MA															
	180620PDFR-MA															
	180624PDFR-MA															
	180630R-MA															
	1806PDER-ML										●	●				
	180604PDER-ML											●				
	180612PDER-ML										●	●				
	180616PDER-ML										●	●				

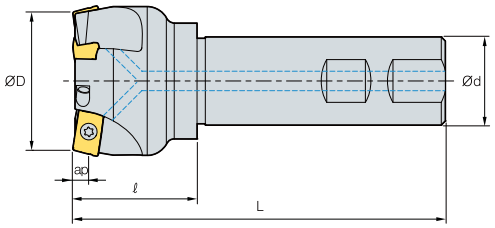
Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	180620PDER-ML											●				E05 E06
	180624PDER-ML										●	●				
	180630R-ML										●	●				
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				
	1806PDSR-MF				●		●			●	●	●				
	180612PDSR-MM			●	●	●	●				●	●				
	180616PDSR-MM				●		●				●	●				
	180620PDSR-MM															
	180624PDSR-MM				●	●					●	●				
	180630R-MM						●				●	●				
	180632R-MM				●	●	●				●	●				

Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTKA0410	TW15S

Available Inserts E05, E06

AMSA1000SE / 2000SE



AA 15°

- AR : -4.5°~-1°
- RR : -3°~0°

(inch)

Designation		⊙	ØD	Ød	ℓ	L	ap	lbs
AMSA	**1100HSE**	3	1.000	1.000	1.181	4.528	0.098	0.90
	2100HSE	2	1.000	1.000	1.181	4.528	0.157	0.88
	2125HSE	3	1.250	1.250	1.575	4.921	0.157	1.59
	2150HSE	3	1.500	1.250	1.575	5.118	0.157	1.90
	2150HSE-S150	3	1.500	1.500	1.575	5.118	0.157	2.65
	2200HSE	4	2.000	1.250	1.575	5.315	0.157	2.16
	2200HSE-S150	4	2.000	1.500	1.575	5.315	0.157	2.87
	2250HSE	5	2.500	1.250	1.575	5.315	0.157	2.73
	2250HSE-S150	5	2.500	1.500	1.575	5.315	0.157	3.46

Available Inserts

APMT-MF

APMT-MM

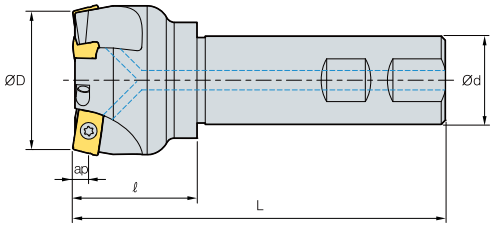
Type	Designation		Cermet		Coated									Uncoated			page
			CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	APMT	**060202PDSR-MM**				●	●					●	●				E05
		0602PDSR-MM				●	●	●	●	●	●	●	●				
		060208PDSR-MM				●	●	●				●	●				
		060212R-MM				●	●	●				●	●				
		060216R-MM					●	●				●	●				
2000 type	APMT	**11T3PDSR-MM**			●	●	●	●	●	●	●	●	●				
		11T3PDSR-MF			●	●	●	●			●	●	●				
		11T308PDSR-MM			●	●	●	●		●		●	●				
		11T312PDSR-MM			●	●	●	●		●		●	●				
		11T316R-MM			●	●	●	●				●	●				
		11T318R-MM															
		11T324R-MM				●	●	●				●	●				

Parts

Specification	 Screw	 Wrench	 Wrench
Ø1.000 (1000type)	FTKA01842	-	TW06S-A
Ø1.000~Ø2.500 (2000type)	FTKA02565S	TW08S	-

Available Inserts **E05**

AMSA3000SE



AA 15°

- AR : -4.5°~-1°
- RR : -3°~0°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
AMSA	**3200HSE**	3	2.000	1.250	1.772	5.315	0.236	2.21
	3200HSE-S150	3	2.000	1.500	1.772	5.315	0.236	2.87
	3250HSE	4	2.500	1.250	1.772	5.315	0.236	2.87
	3250HSE-S150	4	2.500	1.500	1.772	5.315	0.236	3.53

Available Inserts

APMT-MF

APMT-MM

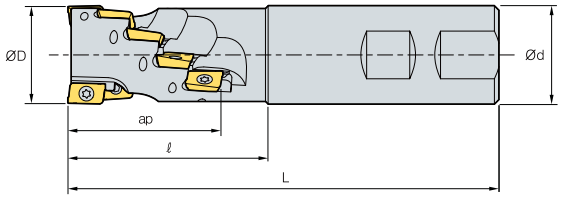
Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	**1604PDSR-MM**			●	●	●	●	●	●	●	●	●				E05 E06
	1604PDSR-MF			●	●	●	●			●	●	●				
	160410PDSR-MM			●			●				●	●				
	160416PDSR-MM			●	●	●	●				●	●				
	160424R-MM				●	●	●				●	●				
	160430R-MM						●				●	●				
	160432R-MM			●	●	●	●				●	●				
	160404PDSR-MM										●	●				
	160420R-MM										●					

Parts

Specification	Screw	Wrench
Ø2.000~Ø2.500	FTKA0410	TW15S

Available Inserts **E05**

AMSA1000M / 1500M



AA 0°

- AR : 7°~9°
- RR : -13°~-10°

(inch)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	lbs
AMSA	1062M	6	0.625	0.625	1.181	3.150	2	0.610	0.66
	1075M	12	0.750	0.750	1.260	3.346	3	0.807	0.66
	1100M	20	1.000	1.000	1.535	3.740	4	1.004	0.66
	15075M	3	0.750	0.750	1.654	4.134	1	1.043	0.66
	15100M	8	1.000	1.000	1.969	4.331	2	1.378	0.66
	15125M	10	1.250	1.250	2.362	4.724	2	1.732	0.66

Available Inserts

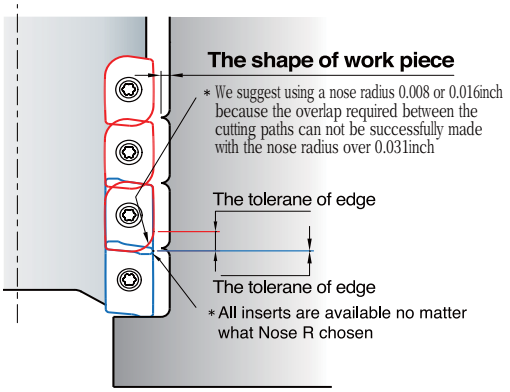
APMT-MA

APMT-ML

APMT-MM

Type	Designation		Cermet		Coated									Uncoated			page
			CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	APMT	0602PDFR-MA														●	E05
		060208PDFR-MA															
		060202PDSR-MM				●	●					●	●				
		0602PDSR-MM				●	●	●	●	●	●	●	●				
		060208PDSR-MM				●	●	●				●	●				
		060212R-MM				●	●	●				●	●				
		060216R-MM					●	●				●	●				
1500 type	APMT	0903PDFR-MA														●	
		090308PDFR-MA															
		0903PDER-ML										●	●				
		090308PDER-ML															
		0903PDSR-MM				●	●	●	●		●	●	●				
		090308PDSR-MM				●	●	●				●	●				
		090312R-MM						●				●	●				
		090316R-MM				●	●	●				●	●				
		090320R-MM					●	●				●	●				

Caution when insert are screwed

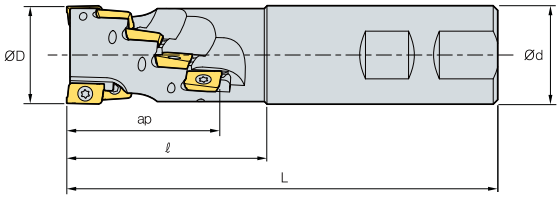


Parts

Specification	Screw	Wrench	Wrench
Ø0.625~Ø1.000 (1000type)	FTKA01842	-	TW06S-A
Ø0.750~Ø1.250 (2000type)	FTKA02565S	TW08S	-

Available Inserts E05

AMSA2000M / 4000M



- AR : 7°~9°
- RR : -13°~-10°

(inch)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	lbs
AMSA	**2075M**	3	0.750	0.750	1.772	4.724	1	1.157	0.71
	2100M	8	1.000	1.000	2.165	5.118	2	1.531	0.88
	2125M	10	1.250	1.250	2.559	5.512	2	1.909	1.43
	2150M	14	1.500	1.654	2.953	5.906	2	2.283	1.65
	4125M	4	1.250	1.250	2.362	5.118	2	1.244	1.43
	4150M	6	1.500	1.500	2.756	5.512	2	1.811	2.45
	4200M-S150	6	2.000	1.500	2.165	4.921	2	1.811	2.69
	4200M	8	2.000	1.500	2.756	5.512	2	2.402	3.02

Available Inserts

APMT-MA

APMT-ML

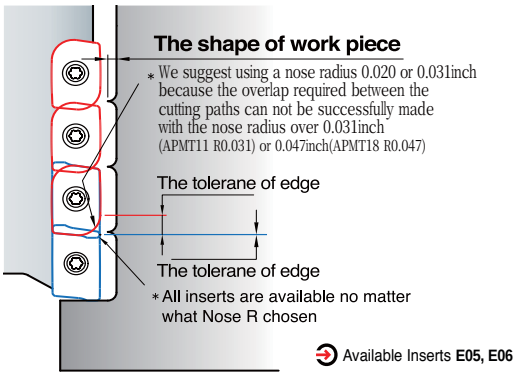
APMT-MM

APMT-MF

Type	Designation	Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated PC3500	Coated PC3600	Coated PC3545	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated ST30A	Uncoated G10	Uncoated H01
2000 type	APMT **11T3PDFR-MA**														●
	11T308PDFR-MA														
	11T3PDER-ML										●	●			
	11T308PDER-ML														
	11T3PDSR-MM			●	●	●	●	●	●	●	●	●			
	11T3PDSR-MF			●	●	●	●			●	●	●			
	11T308PDSR-MM			●	●	●	●		●		●	●			
	11T312PDSR-MM			●	●	●	●		●		●	●			
	11T316R-MM			●	●	●	●				●	●			
	11T318R-MM														
	11T324R-MM				●	●	●				●	●			
4000 type	APMT **1806PDFR-MA**														●
	180604PDFR-MA														
	180612PDFR-MA														
	180616PDFR-MA														
	180620PDFR-MA														
	180624PDFR-MA														

Type	Designation	Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated PC3500	Coated PC3600	Coated PC3545	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated ST30A	Uncoated G10	Uncoated H01	page
4000 type	APMT **180630R-MA**															
	1806PDER-ML										●	●				
	180604PDER-ML											●				
	180612PDER-ML										●	●				
	180616PDER-ML										●	●				
	180620PDER-ML											●				
	180624PDER-ML										●	●				
	180630R-ML										●	●				E05
	1806PDSR-MM			●	●	●	●	●	●	●	●	●				E06
	1806PDSR-MF				●		●			●	●	●				
	180612PDSR-MM			●	●	●	●				●	●				
	180616PDSR-MM				●		●				●	●				
	180620PDSR-MM															
	180624PDSR-MM				●	●					●	●				
	180630R-MM						●				●	●				
	180632R-MM				●	●	●				●	●				

Caution when insert are screwed



Parts

Specification	Screw	Wrench
Ø0.750~Ø1.500 (2000type)	FTKA02565S	TW08S
Ø1.250~Ø2.000 (4000type)	FTKA0410	TW15S

AMSA1000MH / 1500MH / 2000MH / 3000MH

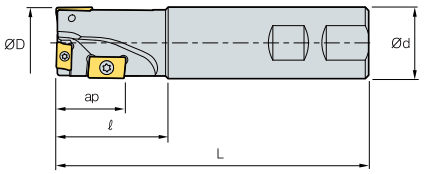


Fig. 1

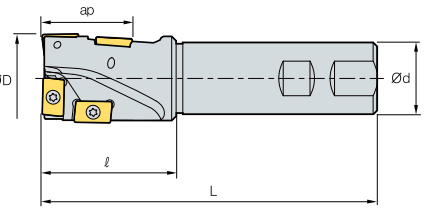


Fig. 2

- AR : 9° ~ 12°
- RR : -12° ~ -10°

(inch)

Designation		⊙	ØD	Ød	ℓ	L	ap	lbs	APMT 0602	APMT 0903	APM(X)T 11T3 -	APKT 1604 -	APKT 1604 -	Fig.
AMSA	1056MH	3	0.5625	0.500	1.181	4.724	0.433	0.35	3	-	-	-	-	1
	1062MH	3	0.6250	0.625	1.181	5.512	0.433	0.44	3	-	-	-	-	1
	1068MH	3	0.6875	0.625	1.181	5.512	0.433	0.46	3	-	-	-	-	1
	15075MH	3	0.7500	0.750	1.378	5.512	0.669	0.68	1	2	-	-	-	1
	2100MH	3	1.0000	1.000	1.575	5.118	0.787	0.99	-	-	3	-	-	1
	2125MH	3	1.2500	1.250	1.969	5.512	1.181	1.65	-	-	1	2		1
	3150MH	4	1.5000	1.250	2.362	5.906	1.575	1.98	-	-	-	-	4	2

Available Inserts

APKT-MF | APKT-MM | APMT-MA | APMT-ML | APMT-MF | APMT-MM | APXT-MA

Type	Designation		Coated									Uncoated			page
			NCM325	NCM335	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	APMT	0602PDFR-MA													●	E04 E05 E06
		060208PDFR-MA														
		060202PDSR-MM			●	●					●	●				
		0602PDSR-MM			●	●	●	●	●	●	●	●				
		060208PDSR-MM			●	●	●				●	●				
1500 type	APMT	0903PDFR-MA													●	
		090308PDFR-MA														
		0903PDER-ML									●	●				
		090308PDER-ML														
		0903PDSR-MM			●	●	●	●		●	●	●				
		090308PDSR-MM			●	●	●				●	●				
2000 type	APMT	11T3PDFR-MA													●	
		11T308PDFR-MA														
		11T3PDER-ML									●	●				
		11T308PDER-ML														
		11T3PDSR-MM	●		●	●	●	●	●	●	●	●				
		11T3PDSR-MF	●		●	●	●			●	●	●				
		11T308PDSR-MM	●		●	●	●		●		●	●				
		11T312PDSR-MM	●		●	●	●		●		●	●				
		11T316R-MM	●		●	●	●				●	●				
		11T318R-MM														
		11T324R-MM			●	●	●				●	●				
3000 type	APMT	1604PDSR-MM	●		●	●	●	●	●	●	●	●				
		1604PDSR-MF	●		●	●	●			●	●	●				
3000-K type	APKT	1604PDSR-MM	●	●		●		●	●	●	●					
		1604PDSR-MF	●								●					

Parts

Specification	Screw	Wrench	Wrench
Ø0.5625~Ø0.6875 (1000type)	FTKA01842	-	TW06S-A
Ø0.7500 (1500type)	FTKA02565S	TW08S	-
Ø1.000~Ø1.2500 (2000type)	FTKA02565S	TW08S	-
Ø1.500 (3000type)	FTKA0410	TW15S	-

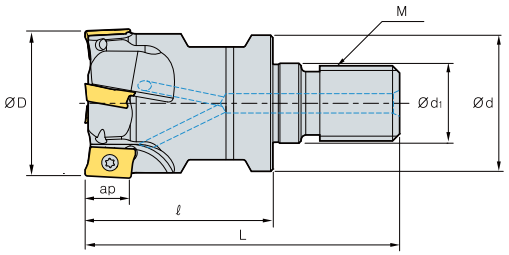
Available Inserts **E04, E05, E06**

Recommended cutting condition

	Drilling	Shouldering	Slotting
vc(sfm)	260~650	260~650	260 ~ 650
fz(ipt)	0.001~0.002	0.002~0.010	0.002~0.008

- Please keep the drill depth under 0.25D when you're drilling
- Please keep the step depth from 0.008 to 0.012inch

AMMA1000



AA 0°

- AR : 7.5°~12.5°
- RR : -28°~-6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	1050HR-M06	3	0.500	0.433	0.256	0.984	1.575	M06	0.22	0.04
	1062HR-M08	4	0.625	0.571	0.335	0.984	1.654	M08	0.22	0.07
	1075HR-M10	5	0.750	0.689	0.413	1.181	2.008	M10	0.22	0.15
	1100HR-M12	7	1.000	0.906	0.492	1.378	2.323	M12	0.22	0.26
	1125HR-M16	8	1.250	1.142	0.669	1.575	2.638	M16	0.22	0.51

Available Inserts

APMT-MA

APMT-MM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	0602PDFR-MA														●	E05
	060208PDFR-MA															
	060202PDSR-MM				●	●					●	●				
	0602PDSR-MM				●	●	●	●	●	●	●	●				
	060208PDSR-MM				●	●	●				●	●				
	060212R-MM				●	●	●				●	●				
	060216R-MM					●	●				●	●				

Available Adaptor

Designation		Available Adaptor
AMMA	1050HR-M06	MATA-M06
	1062HR-M08	MATA-M08
	1075HR-M10	MATA-M10
	1100HR-M12	MATA-M12
	1125HR-M16	MATA-M16

Designation : AMMA1125HR-M16
Modular Head Threading Measure size(M16)

=

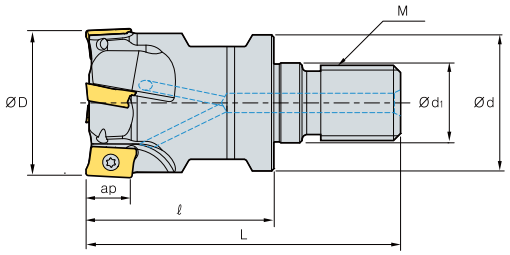
Adaptor Spec. : MATA-M16-354-S125S-C
Adaptor Threading Measure(M16)

Parts

Specification	 Screw	 Wrench
Ø0.500~Ø1.2500	FTKA01842	TW06S-A

Available Inserts E05 Available Adaptors E252~E253

AMMA1500



AA 0°

- AR : 7.5°~12.5°
- RR : -28°~-6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	15050HR-M06	1	0.500	0.433	0.256	0.984	1.575	M06	0.35	0.14
	15062HR-M08	2	0.625	0.571	0.335	0.984	1.654	M08	0.35	0.17
	15075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.35	0.13
	15100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.35	0.26
	15125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.35	0.48

Available Inserts

APMT-MA

APMT-ML

APMT-MM

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	0903PDFR-MA														●	E05
	090308PDFR-MA															
	0903PDER-ML										●	●				
	090308PDER-ML															
	0903PDSR-MM				●	●	●	●		●	●	●				
	090308PDSR-MM				●	●	●				●	●				
	090312R-MM						●				●	●				
	090316R-MM				●	●	●				●	●				
	090320R-MM					●	●				●	●				

Available Adaptor

Designation		Available Adaptor
AMMA	15050HR-M06	MATA-M06
	15062HR-M08	MATA-M08
	15075HR-M10	MATA-M10
	15100HR-M12	MATA-M12
	15125HR-M16	MATA-M16

Designation : AMMA1125HR-M16
Modular Head Threading Measure size(M16)

II

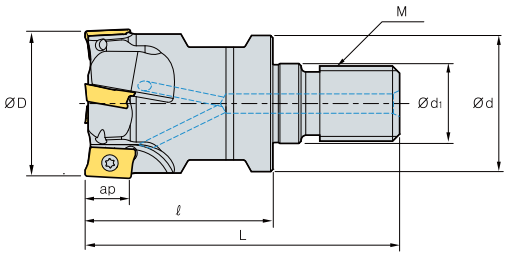
Adaptor Spec. : MATA-M16-354-S125S-C
Adaptor Threading Measure(M16)

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø0.500~Ø1.250	FTKA02555S FTKA02565S	TW08S	Ø0.500~Ø0.563 Ø0.625~Ø4.000

Available Inserts E05 Available Adaptors E252~E253

AMMA2000



AA 0°

- AR : 7.5°~12.5°
- RR : -28°~-6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	2062HR-M08	2	0.625	0.571	0.335	0.984	1.654	M08	0.43	0.09
	2075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.43	0.15
	2100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.43	0.24
	2125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.43	0.51
	2150HR-M16	5	1.500	1.142	0.669	1.575	2.638	M16	0.43	0.55

Available Inserts


APMT-MA


APMT-ML


APMT-MM


APMT-MF

Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
APMT	11T3PDFR-MA														●	E05 E06
	11T308PDFR-MA															
	11T3PDER-ML										●	●				
	11T308PDER-ML															
	11T3PDSR-MM			●	●	●	●	●	●	●	●	●				
	11T3PDSR-MF			●	●	●	●			●	●	●				
	11T308PDSR-MM			●	●	●	●		●		●	●				
	11T312PDSR-MM			●	●	●	●		●		●	●				
	11T316R-MM			●	●	●	●				●	●				
	11T318R-MM															
	11T324R-MM				●	●	●				●	●				

Available Adaptor

Designation		Available Adaptor
AMMA	2062HR-M08	MATA-M08
	2075HR-M10	MATA-M10
	2100HR-M12	MATA-M12
	2125HR-M16	MATA-M16
	2150HR-M16	

Designation : AMMA1125HR-M16
Modular Head Threading Measure size(M16)

||

Adaptor Spec. : MATA-M16-354-S125S-C
Adaptor Threading Measure(M16)

Parts

Specification	Screw	Wrench
Ø0.625~Ø1.500	FTKA02565S	TW08S

Available Inserts E05, E06
Available Adaptors E252~E253

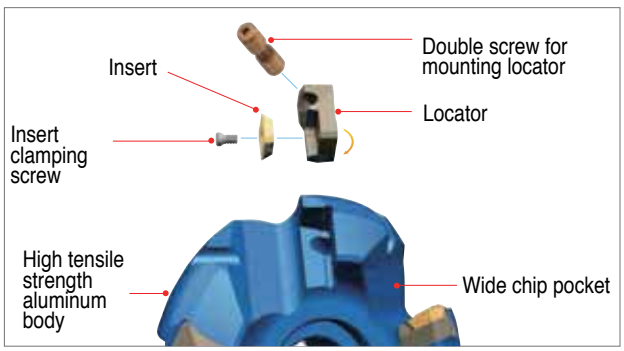
Rigid body employs high tensile aluminum

Future Mill

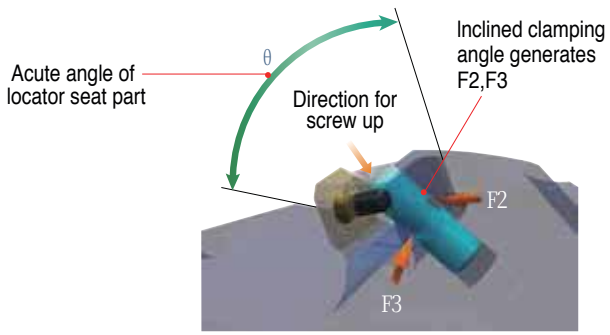
- Light aluminum body(50% of steel body) can be used for high speed cutting, tapping center, and on low power machines
- Easy handling
- It can be used for aluminum alloys, medium cutting of steel, and cast iron
- Rigid body employs high tensile aluminum
- Locators for excellent durability
- Various kinds of chip breaker are available
- Due to the high rake angle, it provides low cutting loads and good surface roughness

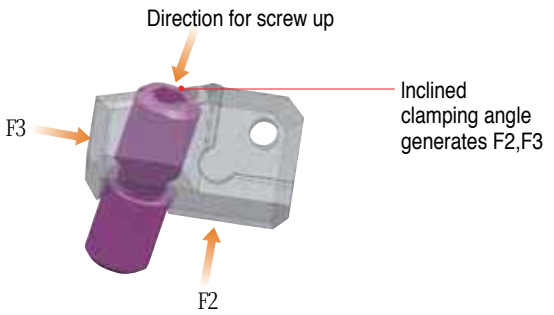
Cutter

- ▶ Strong clamping between aluminum body and locator with double screw provides high efficiency
- ▶ Acute angle of locator seat provides strong clamping
- ▶ Wide chip pocket area provides good chip evacuation
- ▶ High tensile strength aluminum body



Locator

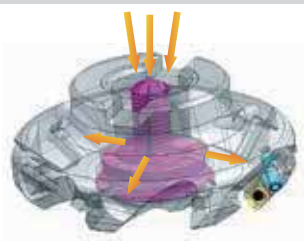




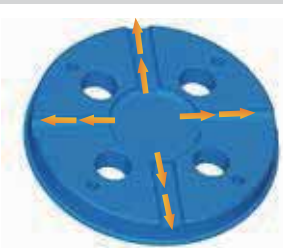
Through coolant system

- ▶ Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation for improved tool life
- ▶ Exact coolant direction to cutting area
- ▶ Exclusive coolant bolt and cover are sold separately. Through coolant arbor is requied

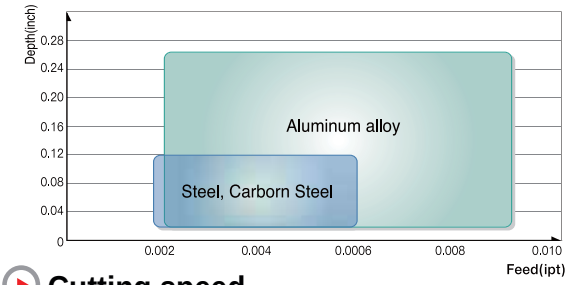
• Bolt : Ø2.5 ~ Ø6.0



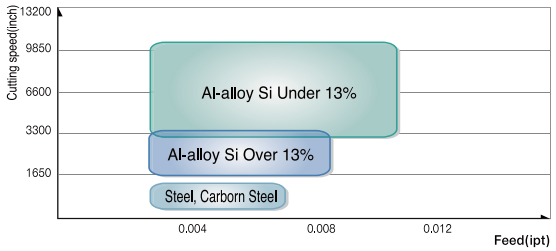
• Cover : Over Ø8.0



Application range as per workpiece



Cutting speed



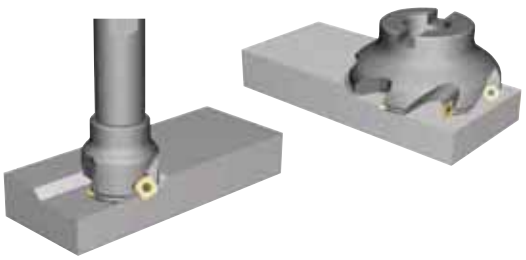
Max. available revolution

Cutter diameter	Max. revolution
Ø2.5	20,000
Ø3.0	16,000
Ø4.0	13,000
Ø5.0	10,000
Ø6.0	8,000
Ø8.0	6,500
Ø10.0	5,000
Ø12.0	4,000

Future Mill(FMA)

Features

- General milling cutter for high productivity
- Adjustable pitch of cutter and various chip breaker offer wide application range.
- Light cutter body allows high speed cutting and can be used in low horse power machine
- Smooth cutting with low cutting load is accomplished with high rake angle



Chip breaker

Type	Chip breaker	Cutting edge	Features of chip breaker
Light cutting	Non C/B		Superior surface roughness at finishing due to ground type cermet insert
	MF 		Superior cutting quality for light and difficult-to-cut material machining through the low cutting load of chip breaker
General cutting	MM 		Suitable for various cutting due to special shape design for general cutting
Roughing	MR 		Tough cutting edge provides stable cutting performance in severe interruption
For aluminum	MA 		Superior cutting quality for aluminum due to sharp cutting edge and buffed surface • SOET-MA: Sharp cutting edge due to high accurate grinding • SOXT-MA: Suitablecutting edge for roughing

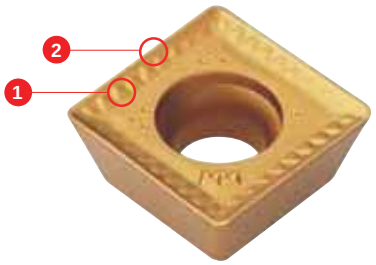
Recommended cutting condition

(inch)

ISO	C/B / Grade	vc(sfm)	MF	MM	MR	MA
			fz(ipt)	fz(ipt)	fz(ipt)	fz(ipt)
P	NC5330	690~1150	0.002~0.008	0.004~0.012	0.004~0.012	-
	NCM325	620~1020	0.002~0.008	0.004~0.012	0.004~0.012	-
	PC3500	525~885	0.002~0.008	0.004~0.012	0.004~0.012	-
M	PC9530	295~490	0.002~0.006	0.004~0.012	-	-
	NCM335	230~390	0.002~0.006	0.004~0.012	-	-
K	PC5300	360~590	0.002~0.008	0.004~0.012	-	-
Aluminum	H01	850~1440	-	-	-	0.004~0.014

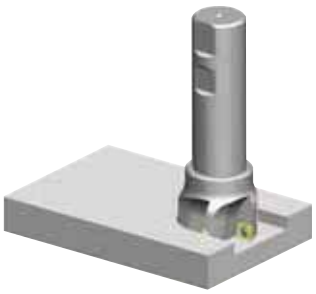
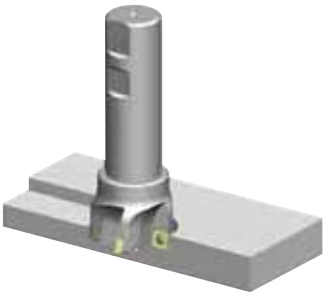
Future Mill(FMP)

Features



- ▶ The strong cutting edge ensures excellent tool life in high feed and high speed, deep depth of cut, with low cutting loads
- ▶ Optimal grades for most workpieces make high efficiency cutting possible
- ▶ Unique chip breaker makes good chip evacuation and lower cutting loads (①)
- ▶ Innovative curve cutting edge lowers cutting load and provides a stronger cutting edge (②)

Machining examples

Features of chip breaker

- ▶ Innovative special cutting edge and chip breaker design ensures ideal 90˚cutting and low cutting load
- ▶ Various applications are available with multi functional cutters (Facing, Slotting, Shouldering)
- ▶ Improved tool life due to special coated grades
- ▶ Superior cutting quality at deep cutting depth through the low cutting load and strong cutting edge

Recommended C/B and grade as per workpiece

Chip breaker		Cutter edge	Recommended C/B and grade as per workpiece (●:1st)									
			Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade
Low cutting load type	MF		●	○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335	●	○NCM325 ○NC5330 ●NCM335	●	●PC6510 ○PC215K	-	-
Reinforced cutting edge type	MM			○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335		○NCM325 ○NC5330 ●NCM335		●PC6510 ○PC215K	-	-
Sharp cutting edge type	MA		-	-	-	-	-	-	-	-	●	●H01 ○G10

Recommended cutting condition

(inch)

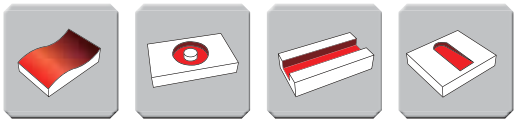
ISO	Cutting Speed vc(sfm)							
	CVD Coated		PVD Coated					Carbide
	NCM325	NCM335	PC3535	PC3545	PC6510	PC8520	PC9530	H01
P	620~1020	590~950	530~890	430~690	-	-	-	-
M	360~590	330~530	-	230~390	-	360~590	300~490	-
K	-	-	-	-	590~760	-	-	-
N	-	-	-	-	-	-	-	850~1440

Future Mill(FMR)

Features

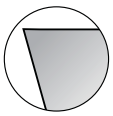
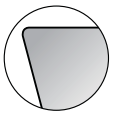
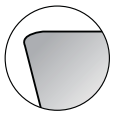
- Wide coverage for medium to roughing, general steel to high hardness mold materials.
- 2 step shape of insert provides strong clamping and can minimize components to replace the shim.
- 4-8 cutting edge available per insert.(Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20)
- Uneven flute spacing prevents vibration on high speed applications and provides more stable machining.
- Precise design of the insert seat prevents insert from chattering.
- Special design of the insert bottom prevents movement and chatter of insert.
- Easy to change cutting edge due to the rotatation prevention design of the insert.

Machining examples



Copying | Helical | Slotting & Side cutting | Ramping

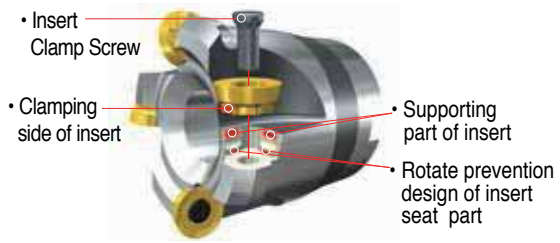
FMR Insert cutting edge shape

Designation	RDHW□□□□M0F	RDHW□□□□M0F	RDHW□□□□M0F
Cutting edge shape (G calss)			

Chip breakers

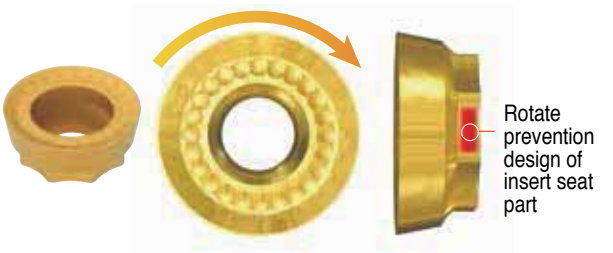
Chip breakers		Cutter edge	Features
Finishing	MF 		Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining
Medium	MM 		Suitable for general milling at wide application range
Aluminum	MA 		Sharp cutting edge and buffed top face for aluminum machining prevent welding and control chip flow

Clamping system



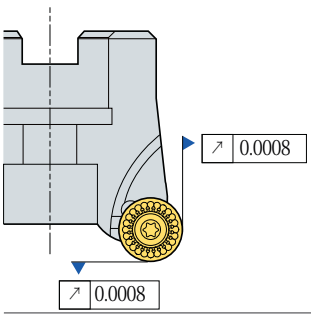
FMR □ 3000 type
FMR □ 4000 type

FMR □ 5000 type
FMR □ 6000 type

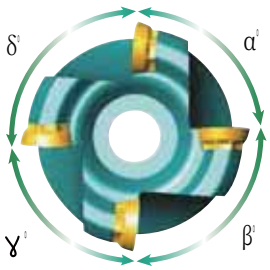


RDKT10T3M0- □□
RDKT1204M0- □□

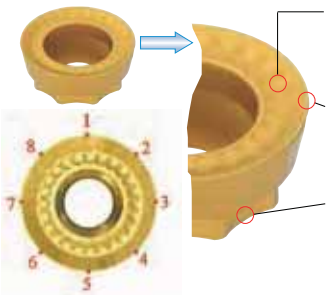
RDKT1605M0-MM
RDKT2006M0-MM



Good surface finish due to the precise design of insert seat part of cutter



Uneven flute spacing prevents vibration at high speed application and provides stable machining



4-8 cutting edge available per insert

- **Special chip breaker for low cutting load**
  Minimized heat generation due to smooth chip flow
- **Smooth cutting edge preparation**
  Inclined land angle
  Low cutting load and better surface roughness
- **Facial contact through curved face**
  Prevent rotation at high speed cutting
  Stable and tight clamping of insert.
  Good positioning of insert repeatedly

Future Mill(FMR)

Chip removal rate (inch³/min)

Workpiece		Grades	Ø0.31	Ø0.37	Ø0.50	Ø0.62	Ø0.63	Ø0.75	Ø0.87	Ø1.00	Ø1.10	Ø1.25	Ø1.30	Ø1.50	Ø2.00	Ø2.48	Ø2.50	Ø4.00	Ø5.00	Ø6.00
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	4.97	9.94	9.94	14.92	31.83	31.83	47.74	47.74	47.74	71.61	38.19	95.49	119.36	143.23	167.11	190.98	133.69	509.29
			V=820, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=984, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=820, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=656, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	General carbon steel (under 30 HRC)		3.97	7.95	7.95	11.93	25.46	25.46	38.19	38.19	38.19	57.29	38.19	76.39	95.49	114.59	133.69	152.78	133.69	458.36
			V=656, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=820, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=656, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=590, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.86	5.72	5.72	8.59	22.91	22.91	34.37	34.37	34.37	51.56	34.37	68.75	85.94	103.13	120.32	137.5	120.32	407.43
			V=590, fz=0.008, ap=0.020, ae=0.5D				vc(sfm)=656, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=590, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=525, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.24	2.48	2.48	3.72	11.45	11.45	14.32	17.18	14.32	21.48	14.32	28.64	35.8	42.97	50.13	57.29	50.13	249.55
			V=426, fz=0.006, ap=0.016, ae=0.5D				vc(sfm)=558, fz(ipt)=0.012 ap(inch)=0.035, ae=0.5D		vc(sfm)=492, fz(ipt)=0.012, ap(inch)=0.040, ae=0.5D											vc(sfm)=459, fz(ipt)=0.016 ap(inch)=0.138, ae=0.5D
	Alloy steel (over 50 HRC)		0.95	1.9	1.9	2.86	7.63	7.63	9.54	11.45	9.54	14.32	9.54	19.09	23.87	28.64	33.42	38.19	33.42	152.78
			V=328, fz=0.006, ap=0.016, ae=0.5D				vc(sfm)=426, fz(ipt)=0.012 ap(inch)=0.035, ae=0.5D		vc(sfm)=328, fz(ipt)=0.012, ap(inch)=0.040, ae=0.5D											vc(sfm)=328, fz(ipt)=0.016 ap(inch)=0.012, ae=0.5D
M	Stainless steel	PC5300	2.06	4.13	4.13	6.2	16.55	16.55	12.41	24.82	12.41	18.62	12.41	24.82	31.03	37.24	43.44	49.65	43.44	331.04
			V=426, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=656, fz(ipt)=0.008 ap(inch)=0.040, ae=0.5D		vc(sfm)=426, fz(ipt)=0.008, ap(inch)=0.060, ae=0.5D											vc(sfm)=426, fz(ipt)=0.020 ap(inch)=0.016, ae=0.5D
K	Cast iron	PC5300	2.86	5.72	5.72	8.59	14.32	14.32	21.48	21.48	21.48	32.22	21.48	42.97	53.71	64.45	75.2	85.94	75.2	366.69
			V=590, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=590, fz(ipt)=0.008 ap(inch)=0.040, ae=0.5D		vc(sfm)=590, fz(ipt)=0.008, ap(inch)=0.060, ae=0.5D											vc(sfm)=590, fz(ipt)=0.016 ap(inch)=0.016, ae=0.5D

Required machine power(P_{KW} = 0.75 x P_{HP})

▶ RDKT10□□

Workpiece		Grades	7/8 inch	1 inch	1 inch	1 1/4 inch	1 5/8 inch	2 inch	2 1/2 inch	3 1/4 inch	4 inch	Cutting condition vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	2.2	2.2	2.2	3.3	4.4	5.5	6.6	7.7	8.8	830	0.016	0.06	0.5D
	General carbon steel (under 30 HRC)		2.1	2.1	2.1	3.1	4.1	5.2	6.2	7.3	8.3	660	0.016	0.06	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	2.2	3.3	4.5	5.6	6.7	7.9	9	600	0.016	0.06	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.1	1.1	1.1	1.6	2.1	2.6	3.2	3.7	4.2	500	0.012	0.04	0.5D
	Alloy steel(over 50 HRC)		0.7	0.7	0.7	1.1	1.4	1.7	2.1	2.4	2.8	330	0.012	0.04	0.5D
M	Stainless steel	PC5300	0.6	0.6	0.6	0.8	1.2	1.5	1.7	2	2.3	430	0.008	0.06	0.5D
K	Cast iron	PC5300	0.6	0.6	0.6	0.9	1.2	1.5	1.8	2.1	2.4	600	0.008	0.06	0.5D

• The figures in the above chart means Php value.

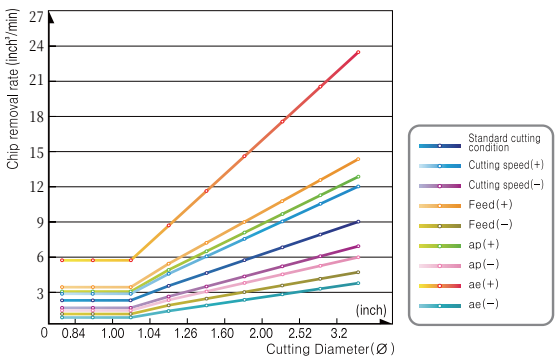
▶ RDKT12贙贙

Workpiece		Grades	1 1/4 inch	15/16 inch	1 5/8 inch	2 inch	2 1/2 inch	3 1/4 inch	4 inch	5 inch	Cutting condition vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	1.7	1.7	2.6	3.5	3.5	4.4	5.3	6.1	660	0.016	0.06	0.5D
	General carbon steel (under 30 HRC)		2	2	3.1	4.1	2.6	5.2	6.2	7.2	600	0.016	0.06	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	3.3	4.4	2.8	5.6	6.7	7.8	530	0.016	0.06	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1	1	1.5	1.6	2.1	2.6	3.1	3.6	460	0.012	0.04	0.5D
	Alloy steel(over 50 HRC)		0.7	0.7	1	1.4	0.8	1.7	2.1	2.4	330	0.012	0.04	0.5D
M	Stainless steel	PC5300	0.5	0.5	0.8	1.1	0.7	1.4	1.7	2	430	0.008	0.06	0.5D
K	Cast iron	PC5300	0.6	0.6	0.9	1.2	0.7	1.5	1.8	2.1	600	0.008	0.06	0.5D

• The figures in the above chart means Php value.

Chip removal rate by cutting condition

• Used insert : RDKT10□



▶Variation of cutting condition

Standard	ISO vc=656 fz=0.016 ap=0.06 ae=0.5D
Speed (+)	830
Speed (-)	500
Feed (+)	0.024
Feed (-)	0.008
ap (+)	0.080
ap (-)	0.040
ae (+)	D
ae (-)	0.008D

Recommended cutting condition

▶ Side milling, Slotting, Ramping, Copying

Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.039	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	804																
		30HRC ≤	PC5300	820	0.028	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.028	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	361																

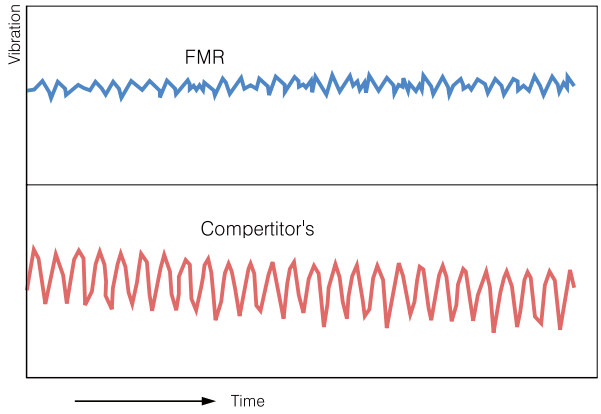
▶ Plunging

Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	804																
		30HRC ≤	PC5300	820	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	361																

▶ Helical cutting

Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.039	0.008	0.039	0.008	0.039	0.008	0.039	0.008	0.079	0.012	0.079	0.016	0.157	0.02	0.157	0.024
			PC5400	804																
		30HRC ≤	PC5300	820	0.028	0.008	0.028	0.008	0.028	0.008	0.028	0.008	0.079	0.012	0.079	0.016	0.146	0.02	0.146	0.024
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.157	0.016	0.157	0.02
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.039	0.008	0.039	0.008	0.039	0.008	0.039	0.008	0.079	0.012	0.079	0.016	0.394	0.02	0.394	0.024
			PC5400	361																

FMR Vibration test

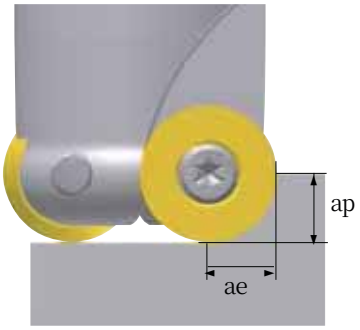


Machining Example

- **Workpiece** STD11
- **Cutting condition** vc = 650sfm
  fz = 0.015ipt
  ap = 0.08inch
  ae = 0.16inch
- **Designation** FMRS3032RD-S
  RDKT10T3M0-MM
  (PC3535)

Cutting condition formulas for milling

Cutting speed	RPM
$vc = \frac{\pi \times D \times n}{12}$ (sfm)	$n = \frac{vc \times 12}{\pi \times D}$ (min^{-1})
Feed(per tooth)	**Feed(per minute)**
$fz = \frac{vf}{n \times z}$ (ipt)	$vf = fz \times n \times z$ (ipm)
Chip removal rate	**Required machine power**
$Q = ap \times ae \times vf$ ($inch^3/min$)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $Php = \frac{Pkw}{0.75}$ (hp)

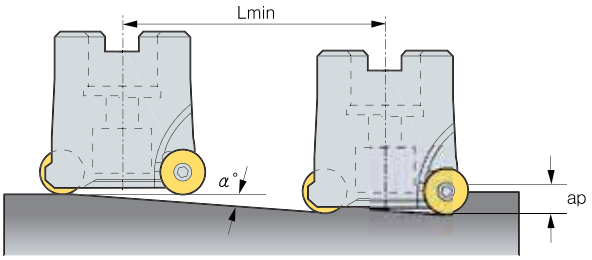


vc	=	Cutting speed(sfm)	**Pkw**	=	Required machine power(Hp)
n	=	Revolution per a minute(min^{-1})	**Php**	=	Horsepower requirement(hp)
D	=	Cutting diameter(inch)	**Q**	=	Chip removal amount($inch^3$/min)
De	=	Efficient cutting diameter(inch)	**ap**	=	Depth of cut(inch)
vf	=	Feed per a minute(ipm)	**ae**	=	Width of cut(inch)
fz	=	Feed per tooth(ipt)	**Kc**	=	Specific cutting resistance(MPa)
z	=	Number of tooth	η	=	Mechanical efficiency(%)
Pc	=	Power requirement(kW)			

Feed as per cutting depth

Designation	Chip breaker	Depth of cut (inch)								
		0.008~0.020	0.020~0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315
RDHW0501M0	-	0.010	0.006	-	-	-	-	-	-	-
RDHW06T1M0	-	0.012	0.008	0.004	-	-	-	-	-	-
RDHW0702M0	-	0.014	0.010	0.004	0.003	-	-	-	-	-
RDHW0803M0	-	0.016	0.012	0.006	0.0004	-	-	-	-	-
RDKT10T3M0 -	MF/MM	-	0.016	0.014	0.012	0.008	-	-	-	-
RDKT1204M0 -	MF/MM	-	0.020	0.018	0.012	0.010	0.009	-	-	-
RDHW1605M0	-	-	0.024	0.020	0.018	0.014	0.012	0.008	0.004	-
RDHW2006M0	-	-	-	0.024	0.020	0.016	0.012	0.010	0.006	0.004
RDKT1605M0 -	MM	-	0.024	0.020	0.018	0.014	0.012	0.008	0.004	-
RDKT2006M0 -	MM	-	-	0.024	0.020	0.016	0.012	0.010	0.006	0.004

Ramping technical data

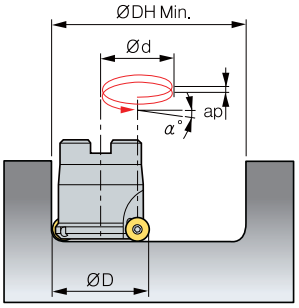


$$L_{min} = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

※ Lmin : Min. inclination cutting length
α° : Max. ramping angle
ap : Depth of cut

Section	Tool Dia.	Ramping angle α° (Max)	Cutting length L(inch) by ramping angle									
			ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	18.14	0.12	0.24	0.30	-	-	-	-	-	-	-
	0.375	11.7	0.19	0.38	0.48	-	-	-	-	-	-	-
	0.500	8.43	0.26	0.53	0.66	-	-	-	-	-	-	-
	0.625	5.93	0.38	0.76	0.95	-	-	-	-	-	-	-
FMR1500	0.375	20.67	0.81	0.21	0.26	0.31	-	-	-	-	-	-
	0.500	10.05	0.40	0.44	0.56	0.67	-	-	-	-	-	-
	0.625	6.12	0.24	0.73	0.92	1.1	-	-	-	-	-	-
	0.750	4.36	0.17	1.03	1.29	1.55	-	-	-	-	-	-
FMR2000	0.625	9.42	0.24	0.47	0.59	0.71	0.83	-	-	-	-	-
	0.750	5.85	0.38	0.77	0.96	1.15	1.34	-	-	-	-	-
FMR2500	0.625	13.7	0.16	0.32	0.40	0.48	0.57	0.65	-	-	-	-
	0.750	9.29	0.24	0.48	0.60	0.72	0.84	0.96	-	-	-	-
	1.000	6.56	0.34	0.68	0.86	1.03	1.20	1.37	-	-	-	-
FMR3000	1.500	9.09	0.25	0.49	0.62	0.74	0.86	0.98	1.23	-	-	-
	2.000	6.52	0.34	0.69	0.86	1.03	1.21	1.38	1.72	-	-	-
	2.500	4.76	0.47	0.95	1.18	1.42	1.65	1.89	2.36	-	-	-
	3.000	3.52	0.64	1.28	1.60	1.92	2.24	2.56	3.20	-	-	-
	4.000	2.69	0.84	1.68	2.09	2.51	2.93	3.35	4.19	-	-	-
FMR4000	2.000	7.13	0.31	0.63	0.79	0.94	1.10	1.26	1.57	1.89	-	-
	2.500	5.08	0.44	0.89	1.11	1.33	1.55	1.77	2.21	2.66	-	-
	3.000	3.69	0.61	1.22	1.53	1.83	2.14	2.44	3.05	3.66	-	-
	4.000	2.79	0.81	1.62	2.02	2.42	2.83	3.23	4.04	4.85	-	-
	5.000	2.14	1.05	2.11	2.63	3.16	3.69	4.21	5.27	6.32	-	-
FMR5000	2.000	5.22	0.43	0.86	1.08	1.29	1.51	1.72	2.15	2.59	3.45	-
	2.500	3.79	0.59	1.19	1.49	1.78	2.08	2.38	2.97	3.57	4.75	-
	3.000	2.97	0.76	1.52	1.90	2.28	2.66	3.04	3.79	4.55	6.07	-
	4.000	2.09	1.08	2.16	2.70	3.24	3.78	4.32	5.39	6.47	8.63	-
	5.000	1.63	1.38	2.77	3.46	4.15	4.84	5.53	6.92	8.30	11.07	-
FMR6000	2.500	3.69	0.61	1.22	1.53	1.83	2.14	2.44	3.05	3.66	4.88	2.44
	3.000	2.72	0.83	1.66	2.07	2.49	2.9	3.31	4.14	4.97	6.63	3.31
	4.000	2.12	1.06	2.13	2.66	3.19	3.72	4.25	5.32	6.38	8.51	4.25
	5.000	1.57	1.44	2.87	3.59	4.31	5.03	5.75	7.18	8.62	11.49	5.74

Helical cutting technical data - ØDH Min

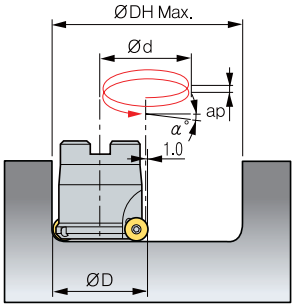


- ØD = Tool Dia.(inch), ØDH Min, Max = Min, Max diameter(inch)
- Ød = Tool Path (inch)
- ØDH Min(Min diameter) = ØD x 2 - Insert size, ØDH Max(Max diameter) = ØD x 2 - 2
- Ød(tool path) = ØDH Min, Max - øD

(inch)

Section	Insert	Tool Dia.	ØDH Min	Ød	Ramping angle (α°)									
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	0.31	0.43	0.12	6.11	12.35	15.57	-	-	-	-	-	-	-
	0.375	0.39	0.59	0.20	3.65	7.34	7.34	-	-	-	-	-	-	-
	0.500	0.47	0.75	0.28	2.61	5.23	5.23	-	-	-	-	-	-	-
	0.625	0.59	0.98	0.39	1.83	3.65	3.65	-	-	-	-	-	-	-
FMR1500	0.375	0.39	0.55	0.16	4.57	9.20	9.20	13.95	-	-	-	-	-	-
	0.500	0.47	0.71	0.24	3.04	6.11	6.11	9.20	-	-	-	-	-	-
	0.625	0.63	1.02	0.39	1.83	3.65	3.65	5.49	-	-	-	-	-	-
	0.750	0.79	1.34	0.55	1.30	2.61	2.61	3.92	-	-	-	-	-	-
FMR2000	0.625	0.59	0.91	0.31	2.28	4.57	4.57	6.88	8.04	-	-	-	-	-
	0.750	0.79	1.3	0.51	1.40	2.81	2.81	4.22	4.92	-	-	-	-	-
FMR2500	0.625	0.63	0.94	0.31	2.28	4.57	4.57	6.88	8.04	9.20	-	-	-	-
	0.750	0.79	1.26	0.47	1.52	3.04	3.04	4.57	5.34	6.11	-	-	-	-
	1.000	0.98	1.65	0.67	1.07	2.15	2.15	3.22	3.76	4.30	-	-	-	-
FMR3000	1.500	1.57	2.76	1.18	0.61	1.22	1.22	1.83	2.13	2.43	3.04	-	-	-
	2.000	1.97	3.54	1.57	0.46	0.91	0.91	1.37	1.60	1.83	2.28	-	-	-
	2.500	2.48	4.57	2.09	0.34	0.69	0.69	1.03	1.21	1.38	1.72	-	-	-
	3.000	3.15	5.91	2.76	0.26	0.52	0.52	0.78	0.91	1.04	1.30	-	-	-
	4.000	3.94	7.48	3.54	0.20	0.41	0.41	0.61	0.71	0.81	1.01	-	-	-
FMR4000	2.000	1.97	3.46	1.5	0.48	0.96	0.96	1.44	1.68	1.92	2.4	2.88	-	-
	2.500	2.48	4.49	2.01	0.36	0.72	0.72	1.07	1.25	1.43	1.79	2.15	-	-
	3.000	3.15	5.83	2.68	0.27	0.54	0.54	0.81	0.94	1.07	1.34	1.61	-	-
	4.000	3.94	7.40	3.46	0.21	0.41	0.41	0.62	0.73	0.83	1.04	1.24	-	-
	5.000	4.92	9.37	4.45	0.16	0.32	0.32	0.48	0.57	0.65	0.81	0.97	-	-
FMR5000	2.000	1.97	3.31	1.34	0.54	1.07	1.07	1.61	1.88	2.15	2.69	3.22	4.30	-
	2.500	2.48	4.33	1.85	0.39	0.78	0.78	1.16	1.36	1.55	1.94	2.33	3.11	-
	3.000	3.15	5.67	2.52	0.29	0.57	0.57	0.86	1.00	1.14	1.43	1.71	2.28	-
	4.000	3.94	7.24	3.31	0.22	0.43	0.43	0.65	0.76	0.87	1.09	1.30	1.74	-
	5.000	4.92	9.21	4.29	0.17	0.33	0.33	0.50	0.59	0.67	0.84	1.00	1.34	-
FMR6000	2.500	3.15	5.51	2.36	0.30	0.61	0.61	0.91	1.06	1.22	1.52	1.83	2.43	3.04
	3.000	3.94	7.09	3.15	0.23	0.46	0.46	0.68	0.8	0.91	1.14	1.37	1.83	2.28
	4.000	4.92	9.06	4.13	0.17	0.35	0.35	0.52	0.61	0.70	0.87	1.04	1.39	1.74
	5.000	6.30	11.81	5.51	0.13	0.26	0.26	0.39	0.46	0.52	0.65	0.78	1.04	1.30

Helical cutting technical data - ØDH Max



- ØD = Tool Dia.(inch), ØDH Min, Max = Min, Max diameter(inch)
- Ød = Tool Path (inch)
- ØDH Min(Min diameter) = ØD x 2 - Insert size, ØDH Max(Max diameter) = ØD x 2 - 2
- Ød(tool path) = ØDH Min, Max - ØD

(inch)

Section	Insert	Tool Dia.	ØDH Min	Ød	Ramping angle (α°)									
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	0.31	0.55	0.24	3.04	6.11	7.65	-	-	-	-	-	-	-
	0.375	0.39	0.71	0.31	2.28	4.57	5.72	-	-	-	-	-	-	-
	0.500	0.47	0.87	0.39	1.83	3.65	4.57	-	-	-	-	-	-	-
	0.625	0.59	1.10	0.51	1.40	2.81	3.51	-	-	-	-	-	-	-
FMR1500	0.375	0.39	0.71	0.31	2.28	4.57	5.72	6.88	-	-	-	-	-	-
	0.500	0.47	0.87	0.39	1.83	3.65	4.57	5.49	-	-	-	-	-	-
	0.625	0.63	1.18	0.55	1.30	2.61	3.26	3.92	-	-	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	-	-	-	-	-	-
FMR2000	0.625	0.59	1.10	0.51	1.40	2.81	3.51	4.22	4.92	-	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	3.55	-	-	-	-	-
FMR2500	0.625	0.63	1.18	0.55	1.30	2.61	3.26	3.92	4.57	5.23	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
	1.000	0.98	1.89	0.91	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
FMR3000	1.500	1.57	3.07	1.50	0.48	0.96	1.20	1.44	1.68	1.92	2.40	-	-	-
	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	-	-	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	-	-	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	-	-	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	-	-	-
FMR4000	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	-	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	-	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	-	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	-	-
	5.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	-	-
FMR5000	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	-
	5.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	-
FMR6000	2.500	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	2.34
	3.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	1.86
	4.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	1.48
	5.000	6.30	12.52	6.22	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	1.16

Future Mill series for mold making

FMR P-positive

New

- Stable clamping system enables stable machining and productivity.
- Varied product line-up ensures wide application range.
- Optimal shape and grade with high hardness for hard-to-cut material machining.

Features

- ▶ P-positive relief angle (11˚) ensures high rigidity and high machinability in die steel and high-resistant alloy machining.
- ▶ Flat clearance face of insert prevents interference and revolution while machining.
- ▶ Optimal grades and chip breakers for various workpieces

- ▶ Chip breaker
  - Concave shape ensures wide chip pocket and lowers cutting temperature.
- ▶ Clearance face for preventing rotation
  - Prevents rotation in machining.
  - Divides corners.
  - Prevents interference in high-feed machining.
  - Ensures stable clamping.
- ▶ Through-coolant system
  - Superb chip evacuation
  - Low cutting heat ensures long tool life.
- ▶ Sockets are compatible with mount bolts in clamping of the cutter greater than Ø3.15
  - More internal machining the internal diameter of cutter reduces weight.
  - Compatible clamping and light cutter facilitate machining.

Usage and features of chip breakers

Chip breaker	Cutting edge	Applications	Features
MA		Aluminum machining	Optimal cutting edge for aluminum machining and buffed surface ensure high machinability.
ML		Titanium machining	Excellent results in titanium machining thanks to a high hardness cutting edge and the chip breaker reducing the cutting load.
MF		Fine finishing	Chip breaker for low cutting resistance enables fine finishing.
MM		General machining	Optimal for general machining
None C/B		Super hard material machining	Optimal for high hardness die steel and heat resistant alloy

Recommended cutting condition

* Recommended chip breaker : ● First ◦ Second

Workpiece			Hardness	Grade	Cutting conditions				Chip breaker					
					vc(sfm)	fz(ipt)	ap(inch)	ae(inch)	MA	ML	MF	MM	None C/B 1	None C/B 2
P	Low carbon steel		HB80~180	PC5400	328~820	0.005~0.028	0.012~0.236	0.7D~0.1D	-	-	●	○	-	-
	High carbon steel		HB180~280	PC5400	328~722	0.005~0.028	0.012~0.236	0.7D~0.1D	-	-	●	○	-	-
	Low alloy steel		Under HRC27	PC3600	590~951	0.008~0.024	0.012~0.236	0.7D~0.1D	-	-	-	●	○	-
				PC5400 / PC5300	328~656	0.008~0.024	0.012~0.236	0.7D~0.1D	-	-	-	●	○	-
	Low pre-hardened steel		HRC20~50	PC3600	426~820	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	-	●	○
				PC5300	164~492	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	-	●	○
	High alloy steel		Under HRC27	PC3600	426~820	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	●	○	-
				PC5300	164~492	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	●	○	-
	High pre-hardened steel		HRC20~48	PC5300	164~492	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	-	●	○
M	Stainless steel		Under HB270	PC5300 / PC5400	328~492	0.008~0.024	0.012~0.236	0.7D~0.1D	-	-	○	●	-	-
K	Gray cast iron, Ductile cast iron		Under 350MPa	PC5300	394~689	0.008~0.024	0.012~0.236	0.7D~0.1D	-	-	○	●	-	-
N	Aluminum		-	H01	984~2,625	0.012~0.024	0.012~0.236	0.7D~0.1D	●	-	-	-	-	-
S	Heat resistant alloy	Fe	HRC30~40	PC5300 / PC5400	115~197	0.012~0.020	~0.020	0.7D~0.1D	-	●	○	-	-	-
		Ni or Co	HRC40~45	PC5300 / PC5400	98~164	0.012~0.020	~0.020	0.7D~0.1D	-	●	○	-	-	-
	Titanium		HRC35~45	PC5300 / PC5400	131~230	0.012~0.020	~0.059	0.7D~0.1D	-	●	○	-	-	-
H	High hardened materials		Over HRC50	PC5300 / PC5400	98~164	0.012~0.020	~0.020	0.7D~0.1D	-	-	-	-	●	○

Feed per tooth according to ap(fz, ipt)

(inch)

Insert	Insert size (d)	Feed per tooth according to ap							
		ap=0.039	ap=0.079	ap=0.118	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
RPMT08	8	0.012	0.009	0.007	0.006	-	-	-	-
RPMT10	10	0.016	0.011	0.01	0.008	0.005	-	-	-
RPMT12	12	0.024	0.018	0.014	0.012	0.01	0.008	-	-
RPMT16	16	0.026	0.018	0.016	0.013	0.012	0.011	0.009	-
RPMT20	20	0.028	0.02	0.017	0.014	0.013	0.011	0.01	0.009

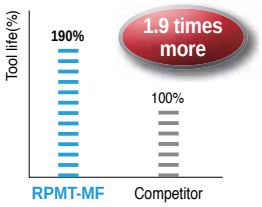
Cutting performace

P Carbon steel (SM490A Heat treatment, HRC 38~40)

■ **Cutting conditions** vc(sfm) = 820
fz(ipt) = 0.024
ap(inch) = 0.039
wet

■ **Tools** **Insert** RPMT1204M0E-MF(PC5300)
Holder FMRSA4125HRP-3L100

■ **Result**

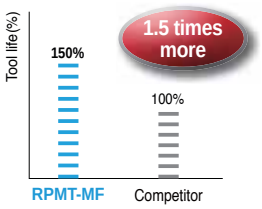


P Alloy steel (KP4M Heat treatment, HRC 30~45)

■ **Cutting conditions** vc(sfm) = 584
fz(ipt) = 0.028
ap(inch) = 0.059
dry

■ **Tools** **Insert** RPMT1606M0S-MM(PC5300)
Holder FMRCA5250HRP-4

■ **Result**

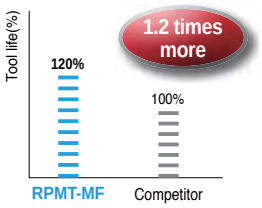


P Alloy steel (KP1, HRC 28~33)

■ **Cutting conditions** vc(sfm) = 584
fz(ipt) = 0.029
ap(inch) = 0.031
dry

■ **Tools** **Insert** RPMT1204M0E-MF(PC5300)
Holder FMRCA4250HRP-6

■ **Result**

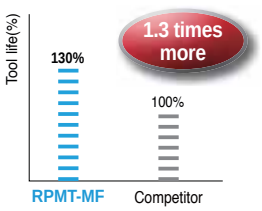


P Alloy steel (STD61, HRC 50~52)

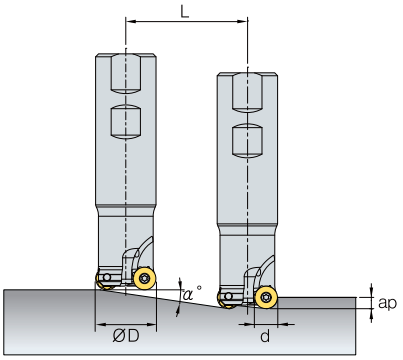
■ **Cutting conditions** vc(sfm) = 164
fz(ipt) = 0.006
ap(inch) = 0.157
dry

■ **Tools** **Insert** RPMW1204M0S1(PC5300)
Holder FMRSA4125HRP-3L100

■ **Result**

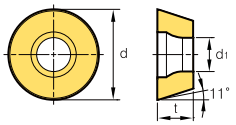


Maximum angle table for Ramping machining



$$L = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

※ L(inch) : Cutting length
α° : Max. ramping angle
ap : Depth of cut

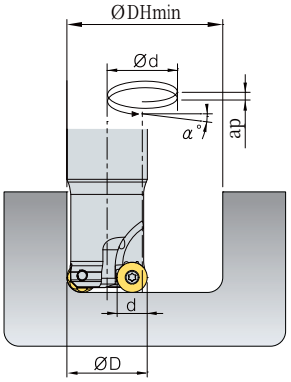


(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	Cutting length L(inch) by ap									
				ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
	0.315	0.688	4.44	0.507	1.013	1.266	1.52	1.773	2.026	-	-	-	-
	0.315	0.75	17.3	0.126	0.253	0.316	0.379	0.442	0.506	-	-	-	-
FMR2500	0.315	0.813	14.4	0.153	0.307	0.383	0.46	0.537	0.613	-	-	-	-
	0.315	1	9.54	0.234	0.468	0.585	0.703	0.82	0.937	-	-	-	-
	0.315	1.063	8.57	0.261	0.522	0.653	0.783	0.914	1.044	-	-	-	-
	0.394	1	13.3	0.167	0.333	0.416	0.5	0.583	0.666	0.833	-	-	-
	0.394	1.063	11.67	0.191	0.381	0.477	0.572	0.667	0.762	0.953	-	-	-
	0.394	1.25	8.52	0.263	0.525	0.657	0.788	0.92	1.051	1.314	-	-	-
FMR3000	0.394	1.313	7.82	0.287	0.574	0.717	0.86	1.004	1.147	1.434	-	-	-
	0.394	1.5	6.26	0.359	0.718	0.897	1.077	1.256	1.435	1.794	-	-	-
	0.394	2	4.09	0.551	1.102	1.378	1.654	1.929	2.205	2.756	-	-	-
	0.394	2.5	3.03	0.743	1.487	1.859	2.23	2.602	2.974	3.717	-	-	-
	0.472	1	4.34	0.519	1.038	1.297	1.557	1.816	2.076	2.594	3.113	-	-
	0.472	1.063	3.76	0.599	1.198	1.498	1.797	2.097	2.396	2.995	3.594	-	-
	0.472	1.25	14.94	0.148	0.295	0.369	0.443	0.517	0.59	0.738	0.886	-	-
	0.472	1.313	13.49	0.164	0.328	0.41	0.492	0.574	0.656	0.821	0.985	-	-
FMR4000	0.472	1.5	10.44	0.214	0.427	0.534	0.641	0.748	0.855	1.069	1.282	-	-
	0.472	2	6.49	0.346	0.692	0.865	1.038	1.211	1.384	1.73	2.076	-	-
	0.472	2.5	4.71	0.478	0.957	1.196	1.435	1.674	1.913	2.391	2.87	-	-
	0.472	3	3.69	0.611	1.221	1.526	1.832	2.137	2.442	3.053	3.663	-	-
	0.472	4	2.58	0.875	1.75	2.188	2.625	3.063	3.5	4.375	5.251	-	-
	0.63	1.5	20.01	0.108	0.216	0.27	0.324	0.378	0.432	0.541	0.649	0.865	-
	0.63	2	10.99	0.203	0.406	0.507	0.608	0.71	0.811	1.014	1.217	1.623	-
	0.63	2.5	7.54	0.298	0.595	0.744	0.893	1.041	1.19	1.488	1.785	2.38	-
FMR5000	0.63	3	5.73	0.392	0.784	0.981	1.177	1.373	1.569	1.961	2.353	3.138	-
	0.63	4	3.87	0.582	1.163	1.454	1.745	2.036	2.326	2.908	3.49	4.653	-
	0.63	5	2.92	0.771	1.542	1.927	2.313	2.698	3.084	3.855	4.626	6.168	-
	0.63	6	2.35	0.96	1.921	2.401	2.881	3.361	3.842	4.802	5.762	7.683	-
	0.787	2	17.22	0.127	0.254	0.318	0.381	0.445	0.508	0.635	0.762	1.016	1.271
	0.787	2.5	10.99	0.203	0.406	0.507	0.608	0.71	0.811	1.014	1.217	1.623	2.028
	0.787	3	8.04	0.279	0.557	0.696	0.836	0.975	1.114	1.393	1.671	2.229	2.786
	0.787	4	5.23	0.43	0.86	1.075	1.29	1.505	1.72	2.15	2.581	3.441	4.301
FMR6000	0.787	5	3.87	0.582	1.163	1.454	1.745	2.036	2.326	2.908	3.49	4.653	5.816
	0.787	6	3.07	0.733	1.466	1.833	2.199	2.566	2.932	3.666	4.399	5.865	7.331
	0.787	8	2.18	1.036	2.072	2.59	3.108	3.627	4.145	5.181	6.217	8.289	10.361
	0.787	10	1.68	1.339	2.678	3.348	4.018	4.687	5.357	6.696	8.035	10.713	13.392

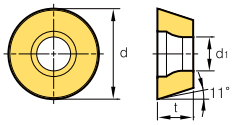
* Insert size(d): Please refer page E13, applicable insert drawing.

Minimum hole diameter table for Helical machining(ØDHmin)



- ØD = Tool Dia.(inch)
- Ød(Tool Path, inch) = ØDHmin, max - ØD
- ØDHmin(Minimum hole diameter) = ØD × 2 - Insert size(d)
- ØDHmax(Maximum hole diameter) = ØD×2 - 2
- Ramping angle by ap(α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut

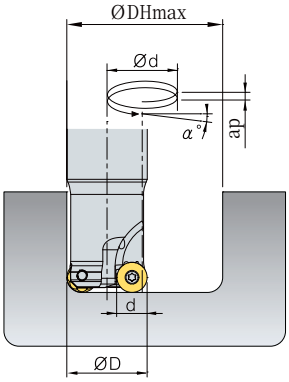


(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	ØDH min	Ød	Ramping angle (inch) by ap									
						ap=1	ap=2	ap=2.5	ap=3	ap=3.5	ap=4	ap=5	ap=6	ap=8	ap=10
FMR2500	0.315	0.688	4.44	1.06	0.37	0.076	0.152	-	-	-	-	-	-	-	-
	0.315	0.75	17.3	1.19	0.44	0.065	0.13	0.163	0.196	0.228	0.261	-	-	-	-
	0.315	0.813	14.4	1.31	0.5	0.057	0.114	0.142	0.171	0.199	0.228	-	-	-	-
	0.315	1	9.54	1.69	0.69	0.041	0.083	0.103	0.124	0.145	0.165	-	-	-	-
	0.315	1.063	8.57	1.81	0.75	0.038	0.076	0.095	0.114	0.133	0.152	-	-	-	-
FMR3000	0.394	1	13.3	1.61	0.61	0.047	0.093	0.117	0.14	0.164	0.187	-	-	-	-
	0.394	1.063	11.67	1.73	0.67	0.042	0.085	0.106	0.127	0.148	0.169	-	-	-	-
	0.394	1.25	8.52	2.11	0.86	0.033	0.066	0.083	0.099	0.116	0.132	-	-	-	-
	0.394	1.313	7.82	2.23	0.92	0.031	0.062	0.077	0.092	0.108	0.123	-	-	-	-
	0.394	1.5	6.26	2.61	1.11	0.026	0.051	0.064	0.077	0.09	0.102	-	-	-	-
	0.394	2	4.09	3.61	1.61	0.018	0.035	0.044	0.053	0.062	0.07	-	-	-	-
	0.394	2.5	3.03	4.61	2.11	0.013	0.027	0.034	0.04	0.047	0.054	-	-	-	-
FMR4000	0.472	1	4.34	1.53	0.53	0.054	0.107	0.134	-	-	-	-	-	-	-
	0.472	1.063	3.76	1.65	0.59	0.048	0.096	0.12	-	-	-	-	-	-	-
	0.472	1.25	14.94	2.03	0.78	0.036	0.073	0.091	0.109	0.127	0.146	0.182	0.219	-	-
	0.472	1.313	13.49	2.15	0.84	0.034	0.067	0.084	0.101	0.118	0.135	0.169	0.203	-	-
	0.472	1.5	10.44	2.53	1.03	0.028	0.055	0.069	0.083	0.096	0.11	0.138	0.165	-	-
	0.472	2	6.49	3.53	1.53	0.019	0.037	0.046	0.056	0.065	0.074	0.093	0.111	-	-
	0.472	2.5	4.71	4.53	2.03	0.014	0.028	0.035	0.042	0.049	0.056	0.07	0.084	-	-
	0.472	3	3.69	5.53	2.53	0.011	0.022	0.028	0.034	0.039	0.045	0.056	0.067	-	-
	0.472	4	2.58	7.53	3.53	0.008	0.016	0.02	0.024	0.028	0.032	0.04	0.048	-	-
FMR5000	0.63	1.5	20.01	2.37	0.87	0.033	0.065	0.081	0.098	0.114	0.13	0.163	0.196	0.261	-
	0.63	2	10.99	3.37	1.37	0.021	0.041	0.052	0.062	0.072	0.083	0.103	0.124	0.165	-
	0.63	2.5	7.54	4.37	1.87	0.015	0.03	0.038	0.045	0.053	0.061	0.076	0.091	0.121	-
	0.63	3	5.73	5.37	2.37	0.012	0.024	0.03	0.036	0.042	0.048	0.06	0.072	0.096	-
	0.63	4	3.87	7.37	3.37	0.008	0.017	0.021	0.025	0.029	0.034	0.042	0.05	0.067	-
	0.63	5	2.92	9.37	4.37	0.006	0.013	0.016	0.019	0.023	0.026	0.032	0.039	0.052	-
	0.63	6	2.35	11.37	5.37	0.005	0.011	0.013	0.016	0.018	0.021	0.026	0.032	0.042	-
FMR6000	0.787	2	17.22	3.21	1.21	0.023	0.047	0.058	0.07	0.082	0.093	0.117	0.14	0.187	0.234
	0.787	2.5	10.99	4.21	1.71	0.017	0.033	0.041	0.05	0.058	0.066	0.083	0.099	0.132	0.165
	0.787	3	8.04	5.21	2.21	0.013	0.026	0.032	0.038	0.045	0.051	0.064	0.077	0.102	0.128
	0.787	4	5.23	7.21	3.21	0.009	0.018	0.022	0.026	0.031	0.035	0.044	0.053	0.07	0.088
	0.787	5	3.87	9.21	4.21	0.007	0.013	0.017	0.02	0.023	0.027	0.034	0.04	0.054	0.067
	0.787	6	3.07	11.21	5.21	0.005	0.011	0.014	0.016	0.019	0.022	0.027	0.033	0.043	0.054
	0.787	8	2.18	15.21	7.21	0.004	0.008	0.01	0.012	0.014	0.016	0.02	0.024	0.031	0.039
	0.787	10	1.68	19.21	9.21	0.003	0.006	0.008	0.009	0.011	0.012	0.015	0.018	0.025	0.031

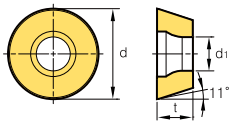
* Insert size(d): Please refer page E13, applicable insert drawing.

Maximum hole diameter table for Helical machining(ØDHmax)



- ØD = Tool Dia.(inch)
- Ød(Tool Path, inch) = ØDHmin, max - ØD
- ØDHmin(Minimum hole diameter) = ØD × 2 - Insert size(d)
- ØDHmax(Maximum hole diameter) = ØD×2 - 2
- Ramping angle by ap(α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut



(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	ØDH max	Ød	Ramping angle (inch) by ap									
						ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR2500	0.315	0.688	4.44	1.3	0.61	0.046	0.093	0.116	0.14	-	-	-	-	-	-
	0.315	0.75	17.3	1.42	0.67	0.042	0.084	0.105	0.127	0.148	0.169	-	-	-	-
	0.315	0.813	14.4	1.55	0.73	0.039	0.077	0.096	0.116	0.135	0.154	-	-	-	-
	0.315	1	9.54	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.315	1.063	8.57	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
FMR3000	0.394	1	13.3	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.394	1.063	11.67	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
	0.394	1.25	8.52	2.42	1.17	0.024	0.048	0.06	0.072	0.085	0.097	-	-	-	-
	0.394	1.313	7.82	2.55	1.23	0.023	0.046	0.057	0.069	0.08	0.092	-	-	-	-
	0.394	1.5	6.26	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	-	-	-	-
	0.394	2	4.09	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	-	-	-	-
	0.394	2.5	3.03	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	-	-	-	-
FMR4000	0.472	1	4.34	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.472	1.063	3.76	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
	0.472	1.25	14.94	2.42	1.17	0.024	0.048	0.06	0.072	0.085	0.097	0.121	0.145	-	-
	0.472	1.313	13.49	2.55	1.23	0.023	0.046	0.057	0.069	0.08	0.092	0.115	0.138	-	-
	0.472	1.5	10.44	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.12	-	-
	0.472	2	6.49	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	-	-
	0.472	2.5	4.71	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	-	-
	0.472	3	3.69	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	-	-
	0.472	4	2.58	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	-	-
FMR5000	0.63	1.5	20.01	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.12	0.159	-
	0.63	2	10.99	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	0.118	-
	0.63	2.5	7.54	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	0.094	-
	0.63	3	5.73	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	0.077	-
	0.63	4	3.87	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	0.058	-
	0.63	5	2.92	9.92	4.92	0.006	0.011	0.014	0.017	0.02	0.023	0.029	0.034	0.046	-
	0.63	6	2.35	11.92	5.92	0.005	0.01	0.012	0.014	0.017	0.019	0.024	0.029	0.038	-
FMR6000	0.787	2	17.22	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	0.118	0.147
	0.787	2.5	10.99	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	0.094	0.117
	0.787	3	8.04	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	0.077	0.097
	0.787	4	5.23	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	0.058	0.072
	0.787	5	3.87	9.92	4.92	0.006	0.011	0.014	0.017	0.02	0.023	0.029	0.034	0.046	0.057
	0.787	6	3.07	11.92	5.92	0.005	0.01	0.012	0.014	0.017	0.019	0.024	0.029	0.038	0.048
	0.787	8	2.18	15.92	7.92	0.004	0.007	0.009	0.011	0.012	0.014	0.018	0.021	0.029	0.036
	0.787	10	1.68	19.92	9.92	0.003	0.006	0.007	0.009	0.01	0.011	0.014	0.017	0.023	0.029

* Insert size(d): Please refer page E13, applicable insert drawing.

FMACA3000

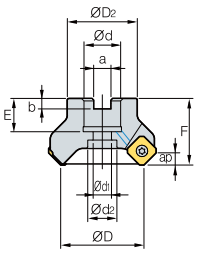


Fig. 1

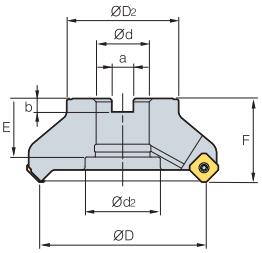


Fig. 2

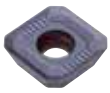
AA 45°

- AR : 21°
- RR : -17°~-12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	3200HR	4	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	1.157	0.9	1
	3200HR-H	6	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	1.157	0.9	1
	3250HR	5	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	1.157	1.1	1
	3250HR-H	8	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	1.157	1.3	1
	3300HR	6	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	1.157	2.4	1
	3300HR-H	10	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	1.157	2.6	1
	3400HR	7	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	1.157	3.9	1
	3400HR-H	12	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	1.157	3.7	1
	3500HR	8	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.22	1.157	7.7	2
	3500HR	14	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.22	1.157	7.7	2

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW


SEEW-W

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SEET	32AGFN-MA														●	E15 E16
	32AGSN-MF			●					●	●	●	●				
	32AGSN-MM			●						●	●	●				
SEXT	32AGSN-MF						●			●	●	●				
	32AGSN-MM					●	●			●	●	●				
	32AGSN-MR															
SEEW	32AGTN															

Parts

Specification	Screw	Insert Wrench
Ø2.0~Ø5.0	FTKA0307	TW09S

Available Inserts **E15, E16**

FMACA4000

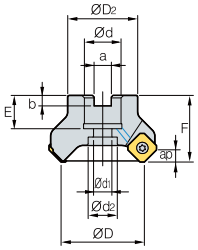


Fig. 1

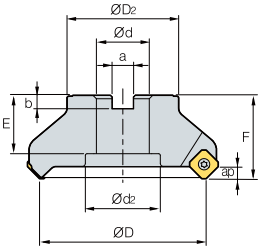


Fig. 2

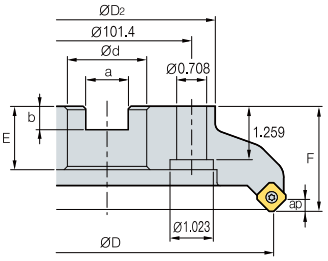


Fig. 3

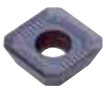
AA 45°

- AR : 21°
- RR : -17°~-12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	4200HR	3	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	0.256	0.9	1
	4250HR	4	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4250HR-M	5	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4250HR-H	6	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4300HR	5	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4300HR-M	6	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4300HR-H	8	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4400HR	5	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4400HR-M	7	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4400HR-H	10	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4500HR	6	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4500HR-M	8	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4500HR-H	12	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4600R	7	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4600R-M	10	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4600R-H	16	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4800R	8	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3
	4800R-M	12	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3
	4800R-H	18	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW


SEEW-W

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA											●			●	
	14M4AGSN-MF			●	●		●	●	●	●	●					
	14M4AGSN-MM			●	●	●		●	●	●	●					
SEXT	14M4AGSN-MF			●		●	●		●	●	●					
	14M4AGSN-MM			●	●	●	●	●	●	●	●					E15
	14M4AGSN-MR			●		●	●	●		●						E16
SEEW	14M4AGTN		●													
	14M4AGFN-W															
	14M4AGSN-W									●						
	14M4AGTN-W						●		●							

Parts

Specification	Screw	Shim	Shim Screw	Insert Wrench	Shim Screw
Ø2.0~Ø8.0	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available Inserts E15, E16

FMACA3000-A

(Aluminum Body)

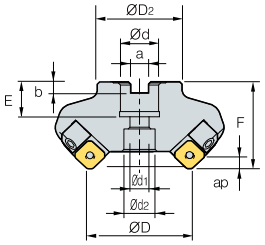


Fig. 1

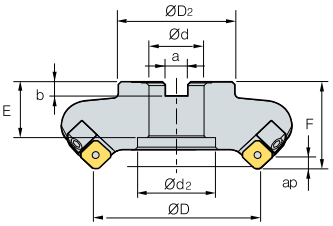


Fig. 2

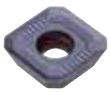
AA 45°

- AR : 21°
- RR : -16°~-12°

(inch)

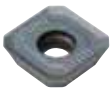
Designation		○	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	**3250R-A**	3	2.50	2.205	1.00	0.38	0.248	0.866	1.75	0.551	0.827	0.157	1.0	1
	3300R-A	4	3.00	2.205	1.00	0.38	0.248	0.866	2.00	0.551	0.827	0.157	1.5	1
	3400R-A	5	4.00	2.874	1.25	0.50	0.319	1.181	2.00	-	1.772	0.157	1.9	2
	3500R-A	6	5.00	3.386	1.50	0.63	0.394	1.181	2.50	-	2.205	0.157	3.4	2

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SEET	**32AGFN-MA**														●	E15 E16
	32AGSN-MF			●					●	●	●	●				
	32AGSN-MM			●						●	●	●				
SEXT	**32AGSN-MF**						●			●	●	●				
	32AGSN-MM					●	●			●	●	●				
	32AGSN-MR															
SEEW	**32AGTN**															

Parts

Specification	Screw	Insert Wrench	Locator Wrench	Locator	Locator Screw
Ø2.50~Ø5.00	FTKA0307	TW09S	HW30L	LFMA3R-A	DHA620

Available Inserts **E15, E16**

FMACA4000-A

(Aluminum body)

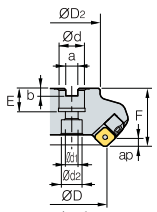


Fig. 1

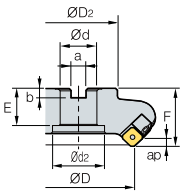


Fig. 2

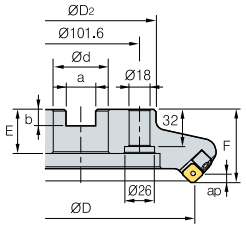


Fig. 3

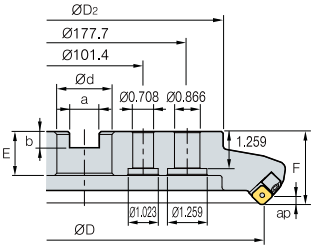


Fig. 4

AA 45°

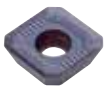
- AR : 21°
- RR : -16° ~ -12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	**4250R-A**	3	2.50	2.205	1.00	0.75	0.433	1.181	2.0	-	0.827	0.256	1.2	1
	4300R-A	4	3.00	2.205	1.00	0.38	0.248	0.866	2.0	-	0.827	0.256	1.6	1
	4400R-A	5	4.00	2.874	1.25	0.5	0.319	1.181	2.0	0.551	1.772	0.256	2.2	2
	4500R-A	6	5.00	3.386	1.50	0.63	0.394	1.181	2.5	0.551	2.205	0.256	3.3	2
	4600R-A	7	6.00	4.882	2.00	0.75	0.433	1.181	2.5	-	2.953	0.256	4.6	2
	4800R-A	8	8.00	5.118	2.50	1.00	0.551	1.496	2.5	-	-	0.256	6.4	3
	41000R-A	10	10.00	7.087	2.50	1.00	0.551	1.496	2.5	-	-	0.256	9.0	3
	41200R-A	12	12.00	9.449	2.50	1.00	0.551	1.496	2.5	-	-	0.256	14.5	3

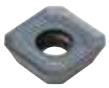
Note) Through coolant type between Ø2.0~Ø5.0

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW


SEEW-W

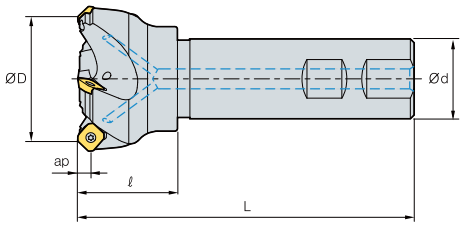
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SEET	**14M4AGFN-MA**											●			●	
	14M4AGSN-MF			●	●		●	●	●	●	●					
	14M4AGSN-MM			●	●	●		●	●	●	●					
SEXT	**14M4AGSN-MF**			●		●	●		●	●	●					
	14M4AGSN-MM			●	●	●	●	●	●	●	●					E15
	14M4AGSN-MR			●		●	●	●		●						E16
SEEW	**14M4AGTN**		●													
	14M4AGFN-W															
	14M4AGSN-W									●						
	14M4AGTN-W						●		●							

Parts

Specification	Screw	Insert Wrench	Locator Wrench	Locator	Locator Screw
Ø2.50~Ø12.00	FTGA03510	TW15S	HW40L	LFMA4R-A	DHA0830

Available Inserts **E15, E16**

FMASA3000



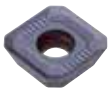
AA 45°

- AR : 23°
- RR : -17° ~ -13°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMASA	**3100HR**	2	1.00	1.00	1.378	4.528	0.157	0.9
	3125HR	3	1.25	1.00	1.575	4.921	0.157	1.1
	3125HR-S125	3	1.25	1.25	1.575	4.921	0.157	1.8
	3150HR	3	1.50	1.25	1.575	5.118	0.157	2.0
	3200HR	4	2.00	1.25	1.575	5.315	0.157	2.2
	3200HR-S150	4	2.00	1.50	1.575	5.512	0.157	2.9
	3250HR	5	2.50	1.25	1.772	5.315	0.157	3.5
	3250HR-S150	5	2.50	1.50	1.772	5.512	0.157	3.7

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW


SEEW-W

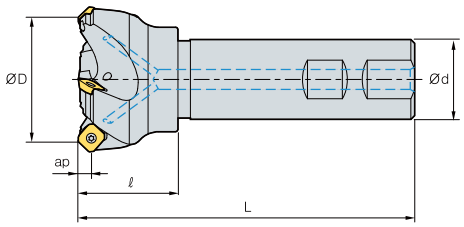
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SEET	**32AGFN-MA**														●	E15 E16
	32AGSN-MF			●					●	●	●	●				
	32AGSN-MM			●						●	●	●				
SEXT	**32AGSN-MF**						●			●	●	●				
	32AGSN-MM					●	●			●	●	●				
	32AGSN-MR															
SEEW	**32AGTN**															

Parts

Specification	Screw	Insert Wrench
Ø1.00~Ø2.50	FTKA0307	TW09S

Available Inserts **E15, E16**

FMASA4000



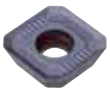
AA 45°

- AR : 23°
- RR : -17°~-13°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMASA	4200HR	3	2.0	1.25	1.772	5.315	0.256	3.3
	4200HR-S150	3	2.0	1.50	1.772	5.315	0.256	4.6
	4250HR	4	2.5	1.25	1.772	5.315	0.256	4.4
	4250HR-S150	4	2.5	1.50	1.772	5.315	0.256	5.7

Available Inserts


SEET-MF


SEET-MM


SEET-MA


SEXT-MF


SEXT-MM


SEXT-MR


SEEW


SEEW-W

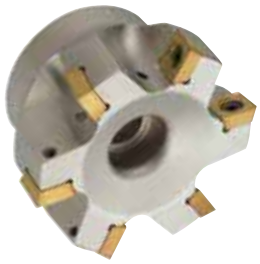
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3530	PC6510	PC5300	PC5400	PC215K	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA											●			●	
	14M4AGSN-MF			●	●		●	●	●	●	●					
	14M4AGSN-MM			●	●	●		●	●	●	●					
SEXT	14M4AGSN-MF			●		●	●		●	●	●					
	14M4AGSN-MM			●	●	●	●	●	●	●	●					E15
	14M4AGSN-MR			●		●	●	●		●						E16
SEEW	14M4AGTN		●													
	14M4AGFN-W															
	14M4AGSN-W									●						
	14M4AGTN-W						●		●							

Parts

Specification	Screw	Shim	Shim Screw	Insert Wrench	Shim Wrench
Ø2.0~Ø2.5	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available Inserts E15, E16

FMPCA3000



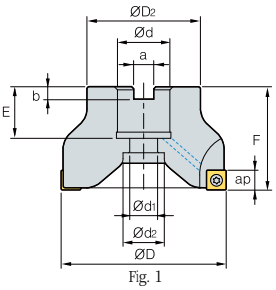


Fig. 1

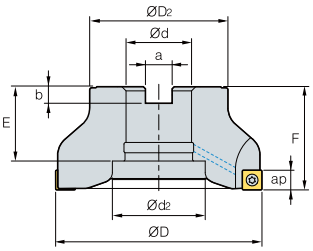
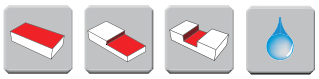


Fig. 2



AA 0°

- AR : 10°
- RR : -9° ~ -8°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	3200HS	5	2.0	1.772	0.75	0.787	1.75	0.413	0.63	0.313	0.220	0.275	0.7	1
	3250HS	6	2.5	2.205	1.00	0.787	1.75	0.551	0.827	0.375	0.248	0.275	1.1	1
	3300HS	7	3.0	2.205	1.00	0.866	2.00	0.551	0.827	0.375	0.248	0.275	2.2	1
	3400HS	8	4.0	2.874	1.25	0.866	2.00	0.709	1.024	0.500	0.319	0.275	3.3	1

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM

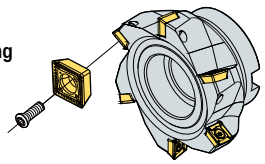

SDXT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PD2000	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	09M402R-MA							●							●	E14
	09M405R-MF															
	09M405R-MM															
SDXT	09M405R-MF			●	●		●		●	●	●	●				
	09M405L-MF															
	09M405R-MM			●	●	●	●		●	●	●	●				
	09M405L-MM						●			●						
	09M405R-MA														●	

Parts

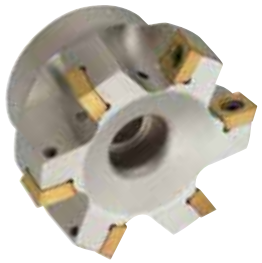
Specification	Screw	Wrench
Ø2.0~Ø4.0	FTGA03508	TW15S

■ Assembling



Available Inserts E14

FMPCA4000



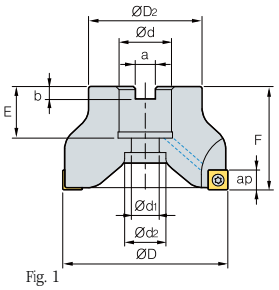
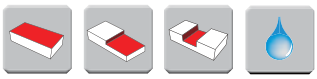


Fig. 1



AA 0°

- AR : 10°
- RR : -9° ~ -8°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	**4250HS**	5	2.5	2.205	1.00	0.787	1.75	0.551	0.827	0.375	0.248	0.433	0.9	1
	4300HS	6	3.0	2.205	1.00	0.787	2.00	0.551	0.827	0.375	0.248	0.433	2.0	1
	4400HS	7	4.0	2.874	1.25	0.827	2.00	0.709	1.024	0.500	0.319	0.433	3.3	1
	4500HS	8	5.0	3.386	1.50	1.063	2.50	0.823	1.220	0.625	0.394	0.433	6.8	1

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

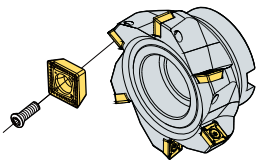
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	**130504R-MA**														●	E14
	130508R-MF															
	130508R-MM															
SDXT	**130508R-MF**			●	●		●		●	●	●	●				
	130508R-MM			●	●	●	●	●	●	●	●	●				
	130538-MM															
	130508R-MA														●	

Parts

Specification	Screw	Wrench
Ø2.5~Ø5.0	FTNC04511	TW20S

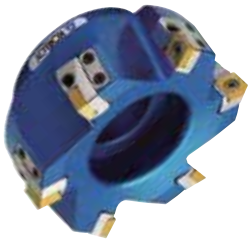
Available Inserts **E14**

■ Assembling



FMPCA3000-A

(Aluminum Body)



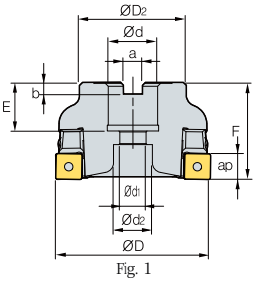


Fig. 1

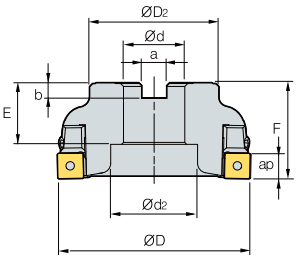


Fig. 2

AA 0°

- AR : 10°
- RR : -9° ~ -7.3°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	**3250S-A**	3	2.50	-	1.00	0.375	0.248	0.866	1.75	-	0.827	0.157	0.5	1
	3300S-A	4	3.00	-	1.00	0.375	0.248	0.866	2.00	-	0.827	0.157	1.0	1
	3400S-A	5	4.00	-	1.25	0.500	0.319	1.181	2.00	-	1.772	0.157	1.5	2

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PD2000	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	**09M402R-MA**							●							●	E14
	09M405R-MF															
	09M405R-MM															
SDXT	**09M405R-MF**			●	●		●		●	●	●	●				
	09M405L-MF															
	09M405R-MM			●	●	●	●		●	●	●	●				
	09M405L-MM						●			●						
	09M405R-MA														●	

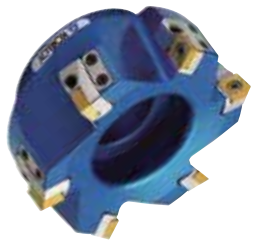
Parts

Specification	Screw	Insert Wrench	Locator Wrench	Locator	Locator Screw	Chip cover	Chip cover Screw
Ø2.50	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R14R1-A	PXMA0306
Ø3.00~Ø4.00	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R-A	PXMA0306

Available Inserts **E14**

FMPCA4000-A

(Aluminum Body)



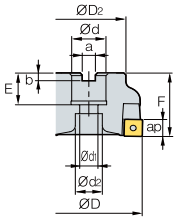


Fig. 1

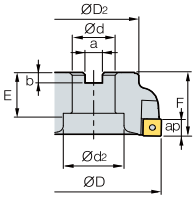


Fig. 2

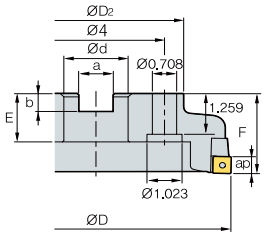


Fig. 3

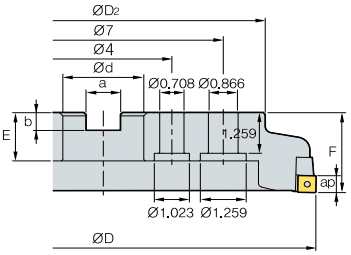


Fig. 4


AA 0°

- AR : 10°
- RR : -9° ~ -7.3°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	**4250S-A**	3	2.50	-	1.00	0.750	0.433	1.181	1.75	-	0.827	0.256	0.5	1
	4300S-A	4	3.00	-	1.00	0.375	0.248	0.866	2.00	-	0.827	0.256	1.0	1
	4400S-A	5	4.00	-	1.25	0.500	0.319	1.181	2.00	-	1.772	0.256	1.5	2
	4500S-A	6	5.00	-	1.50	0.625	0.394	1.181	2.50	-	2.205	0.256	2.9	2
	4600S-A	8	6.00	-	2.00	0.750	0.433	1.181	2.50	-	2.756	0.256	4.4	2
	4800S-A	10	8.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	7.3	3
	41000S-A	12	10.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	11.6	3
	41200S-A	14	12.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	18.4	4

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

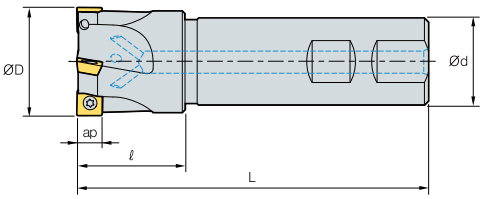
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	**130504R-MA**														●	E14
	130508R-MF															
	130508R-MM															
SDXT	**130508R-MF**			●	●		●		●	●	●	●				
	130508R-MM			●	●	●	●	●	●	●	●	●				
	130538-MM															
	130508R-MA														●	

Parts

Specification	Screw	Insert Wrench	Locator Wrench	Locator	Locator Screw	Chip cover	Chip cover Screw
Ø2.50~Ø3.00	FTNC04509	TW20S	HW40L	LFMP4R1-A	DHA0825	CFMP3R14R1-A	PXMA0306
Ø4.00~Ø12.00	FTNC04509	TW20S	HW40L	LFMP4R-A	DHA0830	CFMP4R-A	PXMA0306

Available Inserts **E14**

FMPSA3000



AA 0°

- AR : 10°
- RR : -9° ~ -8°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMASA	**3100HS**	2	1.00	1.00	1.378	4.528	0.275	0.9
	3125HS	3	1.25	1.00	1.575	4.921	0.275	1.1
	3125HS-S125	3	1.25	1.25	1.575	5.118	0.275	1.3
	3150HS	4	1.50	1.25	1.575	5.118	0.275	1.8
	3200HS	5	2.00	1.25	1.575	5.315	0.275	2.2
	3200HS-S150	5	2.00	1.50	1.575	5.512	0.275	2.9
	3250HS	6	2.50	1.25	1.772	5.709	0.275	2.6
	3250HS-S150	6	2.50	1.50	1.772	5.709	0.275	3.5

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM

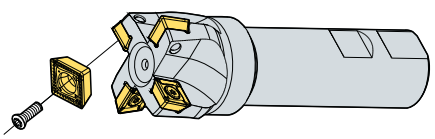

SDXT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PD2000	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	**09M402R-MA**							●							●	E14
	09M405R-MF															
	09M405R-MM															
SDXT	**09M405R-MF**			●	●		●		●	●	●	●				
	09M405L-MF															
	09M405R-MM			●	●	●	●		●	●	●	●				
	09M405L-MM						●			●						
	09M405R-MA														●	

Parts

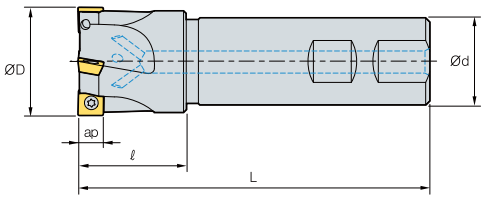
Specification	Screw	Wrench
Ø1.00~Ø2.50	FTGA03508	TW15S

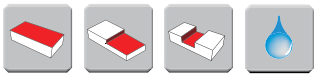
■ Assembling



Available Inserts **E14**

FMPSA4000





AA 0°

- AR : 10°
- RR : -9° ~ -8°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMPSA	**4150HS**	3	1.5	1.25	1.575	5.180	0.433	2.2
	4200HS	4	2.0	1.25	1.772	5.315	0.433	3.3
	4200HS-S150	4	2.0	1.50	1.772	5.709	0.433	3.7
	4250HS	5	2.5	1.25	1.772	5.315	0.433	4.6
	4250HS-S150	5	2.5	1.50	1.772	5.709	0.433	5.3

Available Inserts


SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

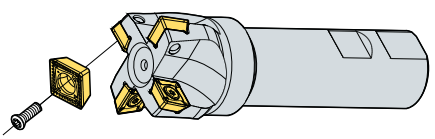
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDET	**130504R-MA**														●	
	130508R-MF															
	130508R-MM															
SDXT	**130508R-MF**			●	●		●		●	●	●	●				E14
	130508R-MM			●	●	●	●	●	●	●	●	●				
	130538-MM															
	130508R-MA														●	

Parts

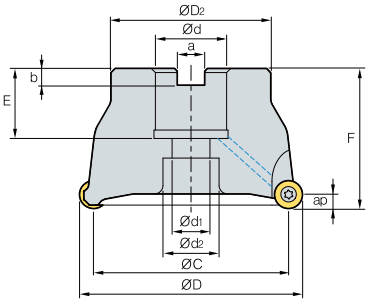
Specification	Screw	Wrench
Ø1.5~Ø2.5	FTNC04511	TW20S

Available Inserts **E14**

■ **Assembling**



FMRCA3000



- AR : 5°
- RR : -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	**3150HRD**	3	1.5	1.11	1.417	0.50	0.250	0.169	0.630	1.50	0.287	0.433	0.196	0.4
	3150HRD-H	4	1.5	1.11	1.417	0.50	0.250	0.169	0.630	1.50	0.287	0.433	0.196	0.4
	3200HRD	4	2.0	1.61	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	0.7
	3200HRD-H	5	2.0	1.61	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	0.7
	3250HRD	5	2.5	2.11	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	1.4
	3250HRD-H	6	2.5	2.11	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	1.4
	3300HRD	6	3.0	2.61	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.196	2.4
	3300HRD-H	7	3.0	2.61	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.196	2.4
	3400HRD	7	4.0	3.61	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.196	4.6
	3400HRD-H	8	4.0	3.61	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.196	4.6

Available Inserts

RDKT-MF

RDKT-MM

RDCT-MA

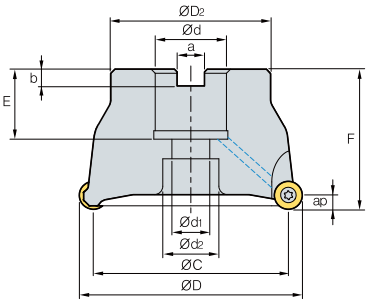
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDCT	**10T3M0-MA**														●	E12 E13
RDKT	**10T3M0-MF**								●		●					
	10T3M0-MM			●	●	●		●	●	●	●					

Parts

Specification	Screw	Wrench
Ø1.5~Ø4.0	FTGA03508	TW15S

Available Inserts **E12, E13**

FMRCA4000



- AR : 5°
- RR : -5°

(inch)

Designation		⊙	ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	**4200HRD**	4	2.0	1.53	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	0.9
	4250HRD	4	2.5	2.03	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	1.3
	4250HRD-M	5	2.5	2.03	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	1.3
	4300HRD	5	3.0	2.53	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.236	2.2
	4300HRD-M	6	3.0	2.53	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.236	2.2
	4400HRD	6	4.0	3.53	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.236	4.2
	4400HRD-M	7	4.0	3.53	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.236	4.2
	4500HRD	7	5.0	4.53	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.236	6.6
	4500HRD-M	8	5.0	4.53	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.236	6.6

Available Inserts

RDKT-MF

RDKT-MM

RDCT-MA

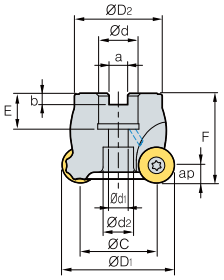
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDCT	**1204M0-MA**														●	E12 E13
RDKT	**1204M0-MF**					●			●		●					
	1204M0-MM			●	●	●		●	●	●	●					

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTKA0410	TW15S

Available Inserts **E12, E13**

FMRCA5000



- AR : 5°
- RR : -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	**5200HRD**	3	2.0	1.37	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	0.9
	5250HRD	4	2.5	1.87	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	1.3
	5250HRD-H	5	2.5	1.87	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	1.3
	5300HRD	5	3.0	2.37	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.314	2.0
	5300HRD-H	6	3.0	2.37	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.314	2.0
	5400HRD	6	4.0	3.37	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.314	4.2
	5400HRD-H	7	4.0	3.37	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.314	4.2
	5500HRD	7	5.0	4.37	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.314	6.6
	5500HRD-H	8	5.0	4.37	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.314	6.6

Available Inserts

RDHW-E,F,S

RDKT-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDHW	**1605M0E**															
	1605M0F															
	1605M0S															E12
RDKT	**1605M0-MM**					●		●								E13
	1605M0-ML															
	1605M0-MF															

Parts

Specification	 Screw	 Wrench
Ø2.0~Ø5.0	FTGA0513-P	TW20-100

Available Inserts **E12, E13**

FMRCA6000

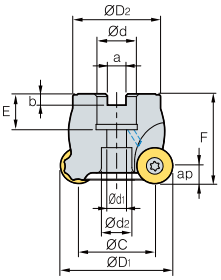


Fig. 1

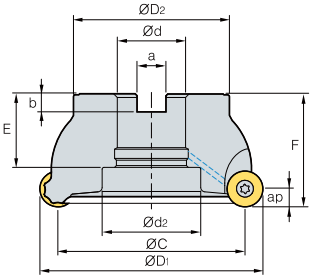


Fig. 2

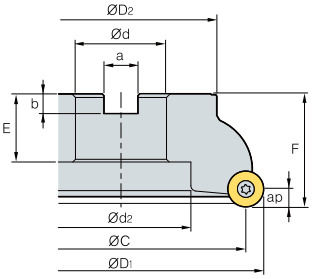


Fig. 3

- AR : 5°
- RR : -5°

(inch)

Designation		⚙	ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMRCA	**6250HRD**	3	2.5	1.72	1.772	0.75	0.313	0.220	0.787	2.00	0.433	0.630	0.393	1.1	1
	6250HRD-M	4	2.5	1.72	1.772	0.75	0.313	0.220	0.787	2.00	0.433	0.630	0.393	1.1	1
	6300HRD	4	3.0	2.22	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.393	1.8	1
	6300HRD-M	5	3.0	2.22	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.393	1.8	1
	6400HRD	5	4.0	3.22	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.393	3.5	1
	6400HRD-M	6	4.0	3.22	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.393	3.5	1
	6500HRD	6	5.0	4.22	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.393	6.0	2
	6500HRD-M	7	5.0	4.22	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.393	6.0	2
	6600HRD	7	6.0	5.22	3.937	1.50	0.626	0.394	1.181	2.50	-	3.150	0.393	9.7	3
	6600HRD-M	8	6.0	5.22	3.937	1.50	0.626	0.394	1.181	2.50	-	3.150	0.393	9.7	3

Available Inserts


RDHW-E,F,S


RDKT-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDHW	**2006M0E**															E12
	2006M0F															E13
	2006M0S															
RDKT	**2006M0-MM**					●		●								

Parts

Specification	Screw	Wrench
Ø2.5~Ø6.0	FTGA0515-P	TW20-100

Available Inserts **E12, E13**

FMRSA1000 / 1500

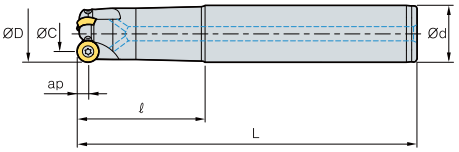


Fig. 1

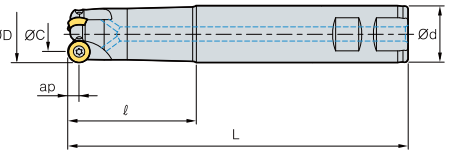


Fig. 2

- AR : 5°
- RR : -5° ~ -1°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	**10031HRD-M**	1	0.312	0.118	0.375	1.181	3.150	0.098	0.4	1
	10031HRD-L	1	0.312	0.118	0.375	1.969	3.937	0.098	0.4	1
	10037HRD-M	2	0.375	0.177	0.500	1.732	3.937	0.098	0.4	1
	10037HRD-L	2	0.375	0.177	0.500	2.520	4.724	0.098	0.4	1
	10050HRD-M	2	0.500	0.303	0.500	1.732	3.937	0.098	0.7	1
	10050HRD-L	2	0.500	0.303	0.625	3.150	6.299	0.098	0.7	1
	10062HRD-M	3	0.625	0.425	0.625	3.150	6.299	0.098	0.7	1
	10062HRD-L	3	0.625	0.425	0.625	3.937	7.874	0.098	0.9	1
	15037HRD-M	1	0.375	0.138	0.500	1.732	3.937	0.118	0.4	1
	15037HRD-L	1	0.375	0.138	0.500	2.520	4.724	0.118	0.4	1
	15050HRD-M	2	0.500	0.264	0.500	2.126	4.331	0.118	0.7	1
	15050HRD-L	2	0.500	0.264	0.625	3.150	6.299	0.118	0.7	1
	15062HRD-M	3	0.625	0.386	0.625	2.362	5.118	0.118	0.7	1
	15062HRD-L	3	0.625	0.386	0.750	3.543	7.087	0.118	0.9	1
	15075HRD-M	3	0.750	0.512	0.750	3.150	5.906	0.118	0.9	1
	15075HRD-L	3	0.750	0.512	0.750	3.543	7.874	0.118	1.1	1

Available Inserts

RDHW-E,F,S

RDKW

Type	Designation		Cermet		Coated									Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	RDHW	**0501M0E**								●							
		0501M0F															
		0501M0S															
	RDKW	**0501M0E**					●										E12
1500 type	RDHW	**06T1M0E**								●							E13
		06T1M0F															
		06T1M0S															
	RDKW	**06T1M0E**					●										

Parts

Specification	Screw	Wrench
Ø0.312~Ø0.625 (1000type)	FTNA0203	TW06P
Ø0.375~Ø0.750 (1500type)	FTNA02205	TW06P

Available Inserts **E12, E13**

FMRSA2000 / 2500

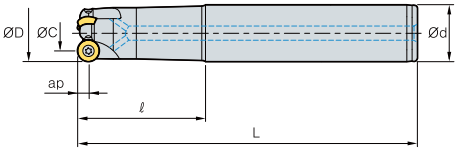


Fig. 1

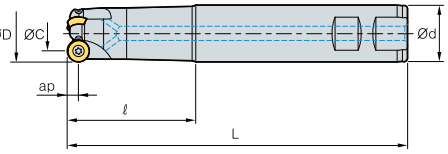


Fig. 2

- AR : 5°
- RR : -5° ~ -1°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	20062HRD-S	2	0.625	0.346	0.625	2.165	4.528	0.138	0.7	2
	20062HRD-M	2	0.625	0.346	0.750	3.150	5.906	0.138	0.9	1
	20062HRD-L	2	0.625	0.346	0.750	3.543	7.874	0.138	1.1	1
	20075HRD-S	3	0.750	0.472	0.750	2.559	4.921	0.138	1.1	2
	20075HRD-M	3	0.750	0.472	0.750	3.150	5.906	0.138	1.1	1
	20075HRD-L	3	0.750	0.472	1.000	3.543	7.874	0.138	1.1	1
	25062HRD-S	2	0.625	0.307	0.625	2.559	4.921	0.157	1.1	2
	25062HRD-M	2	0.625	0.307	0.625	3.150	5.906	0.157	1.1	1
	25062HRD-L	2	0.625	0.307	0.750	3.543	7.874	0.157	1.1	1
	25075HRD-S	2	0.750	0.433	0.750	2.559	4.921	0.157	0.9	2
	25075HRD-M	2	0.750	0.433	0.750	3.150	5.906	0.157	1.1	1
	25075HRD-L	2	0.750	0.433	1.000	3.543	7.874	0.157	1.3	1
	25100HRD-S	3	1.000	0.685	1.000	2.165	4.921	0.157	1.1	2
	25100HRD-M	3	1.000	0.685	1.000	3.543	7.874	0.157	1.3	1
	25100HRD-L	3	1.000	0.685	1.250	4.331	9.843	0.157	1.5	1

Available Inserts

RDHW-E,F,S

RDKW

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	RDHW	0702M0E								●							
		0702M0F															
		0702M0S															
	RDKW	0702M0E					●										E12
2500 type	RDHW	0803M0E								●							E13
		0803M0F															
		0803M0S															
	RDKW	0803M0E					●										

Parts

Specification	 Screw	 Wrench
Ø0.625~Ø0.750 (2000type)	FTNA02555	TW07S
Ø0.625~Ø1.000 (2500type)	FTNA0305 FTNA0306 (Ø0.750이상)	TW09S

Available Inserts E12, E13

FMRSA3000

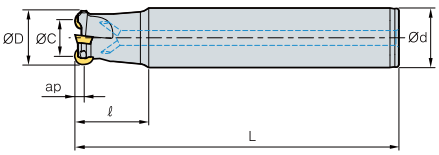


Fig. 1

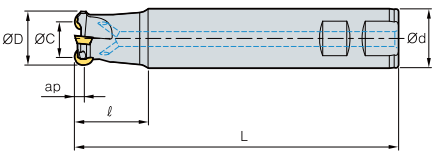


Fig. 2

- AR : 5°
- RR : -8° ~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	**3075HRD-M**	1	0.750	0.358	0.750	1.575	5.906	0.197	0.9	1
	3087HRD-M	2	0.875	0.480	0.750	1.575	5.906	0.197	0.9	1
	3087HRD-M2	1	0.875	0.480	0.750	1.575	5.906	0.197	1.3	1
	3087HRD-L	2	0.875	0.480	0.750	1.969	7.874	0.197	1.3	1
	3087HRD-L2	2	0.875	0.480	0.750	1.969	7.874	0.197	1.1	1
	3100HRD-S	2	1.000	0.606	1.000	1.378	4.528	0.197	1.5	1
	3100HRD-M	2	1.000	0.606	1.000	2.756	7.874	0.197	1.5	1
	3100HRD-L	2	1.000	0.606	1.000	3.937	9.843	0.197	1.5	1
	3125HRD-S	2	1.250	0.858	1.250	1.575	4.921	0.197	1.5	1
	3125HRD-M	3	1.250	0.858	1.250	2.756	7.874	0.197	2.2	2
	3125HRD-L	3	1.250	0.858	1.250	5.906	11.811	0.197	2.9	1
	3150HRD-S	3	1.500	1.106	1.250	1.575	4.921	0.197	3.5	1
	3150HRD-M	4	1.500	1.106	1.250	2.756	7.874	0.197	2.9	2
	3150HRD-L	4	1.500	1.106	1.250	5.906	11.811	0.197	3.3	1
	3040HRD-L	4	1.500	1.106	1.250	1.575	4.921	0.197	4.0	1

Available Inserts

RDKT-MF

RDKT-MM

RDCT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDCT	**10T3M0-MA**														●	E12
RDKT	**10T3M0-MF**								●		●					E13
	10T3M0-MM			●	●	●		●	●	●	●					

Parts

Specification	Screw	Wrench
Ø0.750~Ø1.500	FTGA03508(07)	TW15S

Available Inserts **E12, E13**

FMRSA4000

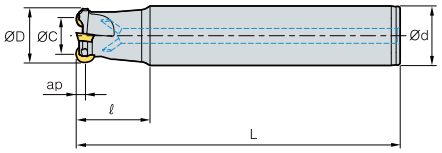


Fig. 1

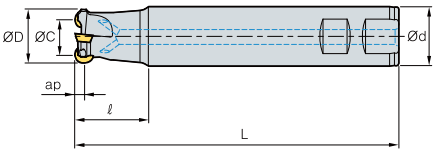


Fig. 2

- AR : 5°
- RR : -8° ~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	**4125HRD-S**	2	1.250	0.708	1.250	1.575	4.921	0.197	1.8	2
	4125HRD-M	2	1.250	0.708	1.250	2.756	7.874	0.236	2.4	1
	4125HRD-L	2	1.250	0.708	1.250	5.906	11.811	0.236	3.5	1
	4150HRD-S	3	1.500	1.028	1.250	1.575	4.921	0.236	2.0	2
	4150HRD-M	3	1.500	1.028	1.250	2.756	7.874	0.236	2.4	1
	4150HRD-L	3	1.500	1.028	1.250	5.906	11.811	0.236	3.7	1
	4150HRD-S150	3	1.500	1.028	1.500	1.575	4.921	0.236	2.2	2
	4150HRD-M150	3	1.500	1.028	1.500	2.756	7.874	0.236	3.5	1
	4150HRD-L150	3	1.500	1.028	1.500	5.906	11.811	0.236	4.0	1
	4200HRD-S	4	2.000	1.528	1.500	1.969	5.906	0.236	2.9	2
	4200HRD-M	4	2.000	1.528	1.500	1.969	9.843	0.236	4.4	1
	4200HRD-L	4	2.000	1.528	1.500	1.969	11.811	0.236	5.3	1

Available Inserts

RDKT-MF

RDKT-MM

RDCT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDCT	**1204M0-MA**														●	E12 E13
RDKT	**1204M0-MF**					●			●		●					
	1204M0-MM			●	●	●		●	●	●	●					

Parts

Specification	Screw	Wrench
Ø1.250~Ø2.000	FTKA0410	TW15S

Available Inserts **E12, E13**

FMRSA5000

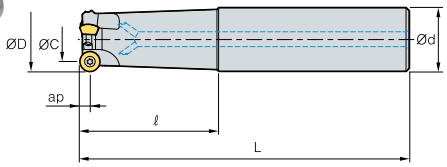


Fig. 1

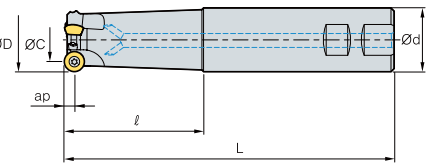


Fig. 2

- AR : 5°
- RR : -8° ~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	**5150HRD-S**	2	1.500	0.870	1.250	1.575	4.921	0.315	3.1	2
	5150HRD-M	2	1.500	0.870	1.250	1.969	7.874	0.315	4.0	1
	5150HRD-L	2	1.500	0.870	1.250	1.969	11.811	0.315	4.4	1
	5150HRD-S150	2	1.500	0.870	1.500	1.575	4.921	0.315	3.5	2
	5150HRD-M150	2	1.500	0.870	1.500	2.756	7.874	0.315	4.0	1
	5150HRD-L150	2	1.500	0.870	1.500	5.906	11.811	0.315	5.3	1
	5200HRD-S	3	2.000	1.370	1.500	1.969	5.906	0.315	4.0	2
	5200HRD-M	3	2.000	1.370	1.500	1.969	9.843	0.315	5.3	1
	5200HRD-L	3	2.000	1.370	1.500	1.969	11.811	0.315	6.2	1
	5250HRD-S	4	2.500	1.862	1.500	1.969	5.906	0.315	4.0	2
	5250HRD-M	4	2.500	1.862	1.500	1.969	9.843	0.315	5.3	1
	5250HRD-L	4	2.500	1.862	1.500	1.969	11.811	0.315	5.7	1

Available Inserts

RDHW-E,F,S

RDKT-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDHW	**1605M0E**															
	1605M0F															
	1605M0S															E12
RDKT	**1605M0-MM**					●		●								E13
	1605M0-ML															
	1605M0-MF															

Parts

Specification	 Screw	 Wrench
Ø1.500~Ø2.500	FTGA0513-P	TW20-100

Available Inserts **E12, E13**

FMRSA6000

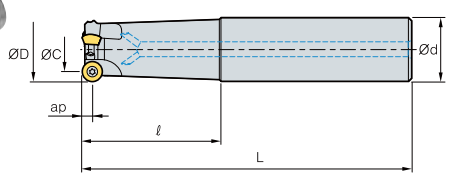


Fig. 1

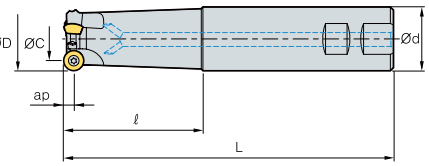


Fig. 2

- AR : 5°
- RR : -8° ~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	**6200HRD-S**	3	2.000	1.213	1.500	1.969	5.906	0.394	2.9	2
	6200HRD-M	3	2.000	1.213	1.500	1.969	9.843	0.394	3.1	1
	6200HRD-L	3	2.000	1.213	1.500	1.969	11.811	0.394	4.9	1
	6250HRD-S	4	2.500	1.713	1.500	1.969	5.906	0.394	5.3	2
	6250HRD-M	4	2.500	1.713	1.500	1.969	9.843	0.394	6.0	1
	6250HRD-L	4	2.500	1.713	1.500	1.969	11.811	0.394	6.6	1

Available Inserts

RDHW-E,F,S

RDKT-MM

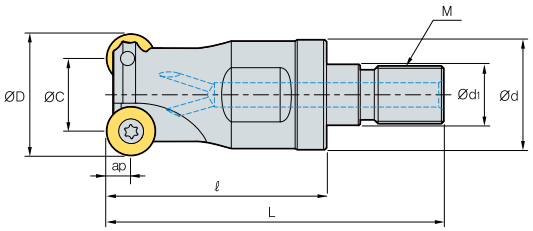
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RDHW	**2006M0E**															E12 E13
	2006M0F															
	2006M0S															
RDKT	**2006M0-MM**					●		●								

Parts

Specification	Screw	Wrench
Ø2.000~Ø2.500	FTGA0515-P	TW20-100

Available Inserts **E12, E13**

FMRMA1000 / 1500 / 2000 / 2500



- AR : 0°~5°
- RR : -5°~-1°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	10031HRD-M06	1	0.312	0.118	0.256	0.374	0.984	1.575	M06	0.098	0.04
	10037HRD-M06	2	0.375	0.177	0.256	0.374	0.984	1.575	M06	0.098	0.04
	10050HRD-M06	2	0.500	0.303	0.256	0.433	0.984	1.575	M06	0.098	0.09
	10062HRD-M08	3	0.625	0.425	0.335	0.570	1.181	1.850	M08	0.098	0.09
	15037HRD-M06	1	0.375	0.138	0.256	0.374	0.984	1.575	M06	0.118	0.07
	15050HRD-M06	2	0.500	0.264	0.256	0.433	0.984	1.575	M06	0.118	0.04
	15062HRD-M08	3	0.625	0.390	0.335	0.700	1.181	1.850	M08	0.118	0.04
	15075HRD-M010	3	0.750	0.512	0.413	0.709	1.378	2.205	M10	0.118	0.15
	20062HRD-M08	2	0.625	0.350	0.335	0.570	1.181	1.850	M08	0.138	0.09
	20075HRD-M010	3	0.790	0.472	0.413	0.709	1.378	2.205	M10	0.138	0.15
	25062HRD-M08	2	0.625	0.311	0.335	0.570	1.181	1.850	M08	0.157	0.09
	25075HRD-M010	2	0.750	0.433	0.413	0.709	1.378	2.205	M10	0.157	0.15
	25100HRD-M12	3	1.000	0.685	0.492	0.886	1.772	2.717	M12	0.157	0.29

Available Inserts

RDHW-E,F,S

RDKW

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
1000 type	RDHW	0501M0E,F,S								●							E12 E13
	RDKW	0501M0E					●										
1500 type	RDHW	06T1M0E,F,S								●							
	RDKW	06T1M0E					●										
2000 type	RDHW	0702M0E.F,S								●							
	RDKW	0702M0E					●										
2500 type	RDHW	0803M0E,F,S								●							
	RDKW	0803M0E					●										

Available Adaptor

Designation		Available Adaptor	Designation		Available Adaptor
FMRMA	10031HRD-M06	MATA - M06	FMRMA	15075HRD-M10	MATA - M10
	10037HRD-M06			20062HRD-M08	MATA - M08
	10050HRD-M06			20075HRD-M08	MATA - M10
	10062HRD-M08	MATA - M08		25062HRD-M10	MATA - M08
	15037HRD-M06	MATA - M06		25075HRD-M10	MATA - M10
	15050HRD-M06			25100HRD-M12	MATA - M12
	15062HRD-M08	MATA - M08			

Designation : FMRMA10031HRD-M06
Modular Head Threading Measure size(M06)

=

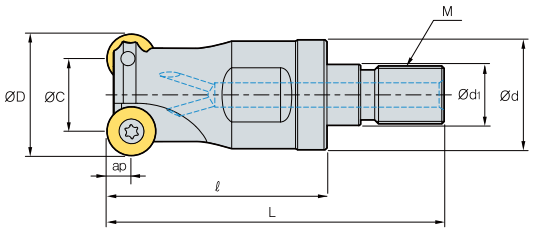
Adaptor Spec. : MATA-M06-078-S038S
Adaptor Threading Measure(M06)

Parts

Specification	Screw	Wrench	Wrench
Ø0.312~Ø0.625 (1000type)	FTNA0203	TW06P	-
Ø0.375~Ø0.750 (1500type)	FTNA02205	TW06P	-
Ø0.625~Ø0.790 (2000type)	FTNA02555	-	TW07S
Ø0.625~Ø1.000 (2500type)	FTNA0305	-	TW09S

Available Inserts E12, E13 Available Adaptors E252~E253

FMRMA3000 / 4000 / 5000



- AR : 0°~5°
- RR : -8°~-5°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	3087HRD-M10	2	0.875	0.480	0.413	0.709	1.378	2.205	M10	0.197	0.2
	3100HRD-M12	2	1.000	0.606	0.492	0.886	1.772	2.717	M12	0.197	0.3
	3125HRD-M16	3	1.250	0.858	0.650	1.142	1.969	3,031	M16	0.197	0.4
	3150HRD-M16	4	1.500	1.106	0.650	1.142	1.969	3.031	M16	0.197	0.5
	4100HRD-M12	2	1.000	0.528	0.492	0.886	1.772	2.717	M12	0.236	0.3
	4125HRD-M16	2	1.250	0.780	0.669	1.142	1.969	3.031	M16	0.236	0.5
	4150HRD-M16	3	1.500	1.028	0.669	1.142	1.969	3.031	M16	0.236	0.5
	5150HRD-M16	2	1.500	0.870	0.669	1.142	1.969	3.031	M16	0.315	0.6

Available Inserts


RDHW-E,F,S


RDCT-MA


RDKT-MF


RDKT-MM

Type	Designation		Cermet		Coated									Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	RDCT	10T3M0-MA														●	E12 E13
	RDKT	10T3M0-MF								●		●					
		10T3M0-MM			●	●	●		●	●	●	●					
4000 type	RDCT	1204M0-MA														●	
	RDKT	1204M0-MF					●			●		●					
		1204M0-MM			●	●	●		●	●	●	●					
5000 type	RDHW	1605M0E,F,S															
	RDKT	1605M0-MM					●		●								
		1605M0-ML															

Available Adaptor

Designation		Available Adaptor	Designation		Available Adaptor
FMRM	3087HRD-M10	MATA - M10	FMRM	4100HRD-M12	MATA - M12
	3100HRD-M12	MATA - M12		4125HRD-M16	MATA - M16
	3125HRD-M16	MATA - M16		4150HRD-M16	
	3150HRD-M16			4042HRD-M16	
				4150HRD-M16	MATA - M16

Designation : FMRMA10031HRD-M06
Modular Head Threading Measure size(M06)

II

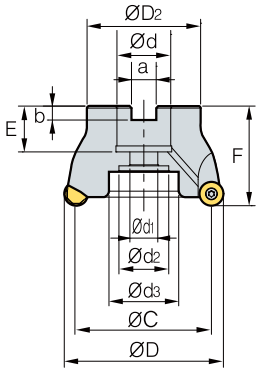
Adaptor Spec. : MATA-M06-078-S038S
Adaptor Threading Measure(M06)

Parts

Specification	Screw	Wrench
Ø0.875~Ø1.500 (3000type)	FTGA03508(07)	TW15S
Ø25~Ø1.500 (4000type)	FTKA0410	TW15S
Ø1.500 (5000type)	FTGA0513-P	TW20-100

Available Inserts E12, E13 Available Adaptors E252~E253

FMRCA3000 Neu



- AR : 5°
- RR : -4°~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Insert size
FMRCA	3150HRP-5	5	1.500	38.100	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.20	0.49	0.394
	3200HRP-6	6	2.000	50.800	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.750	0.20	0.77	0.394
	3250HRP-6	6	2.500	63.500	2.205	1.000	0.551	0.827	0.374	0.248	0.787	1.750	0.20	1.21	0.394
	3250HRP-7	7	2.500	63.500	2.205	1.000	0.551	0.827	0.374	0.248	0.787	1.750	0.20	1.23	0.394

Available Inserts


RPCT-MA


RPMT-ML


RPMT-MF


RPMT-MM


RPMW

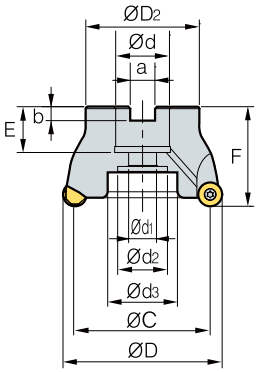
Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	10T3M0-MA														●	E13
RPET	10T3M0E-ML										●	●				
RPMT	10T3M0E-MF						●				●	●				
	10T3M0S-MM						●				●	●				
RPMW	10T3M0E1						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.500~Ø2.500	FTGA03508	TW15S	Ø1.500~Ø2.500

Available Inserts E13

FMRCA4000



- AR : 5°
- RR : -2°~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Insert size
FMRCA	**4200HRP-4**	4	2.000	50.800	1.772	0.750	0.413	0.630	-	0.315	0.220	0.787	1.750	0.24	0.57	0.472
	4200HRP-5	5	2.000	50.800	1.772	0.750	0.413	0.630	-	0.315	0.220	0.787	1.750	0.24	0.62	0.472
	4250HRP-5	5	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.24	0.97	0.472
	4250HRP-6	6	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.24	1.06	0.472
	4300HRP-6	6	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.24	2.03	0.472
	4300HRP-7	7	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.24	1.98	0.472
	4400HRP-7	7	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.24	3.22	0.472

Available Inserts


RPCT-MA


RPMT-ML


RPMT-MF


RPMT-MM


RPMW

Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	**1204M0-MA**														●	E13
RPET	**1204M0E-ML**										●	●				
RPMT	**1204M0E-MF**						●				●	●				
	1204M0S-MM						●				●	●				
RPMW	**1204M0S1**						●				●	●				
	1204M0S2										●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø2.000~Ø4.000	FTKA0410	TW15S	Ø2.000~Ø4.000

Available Inserts **E13**

FMRCA5000

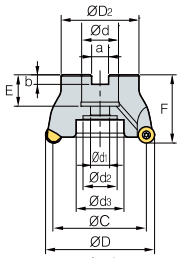


Fig.1

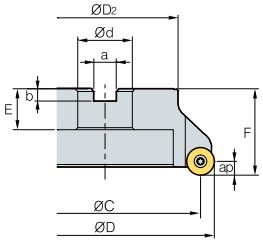


Fig.2

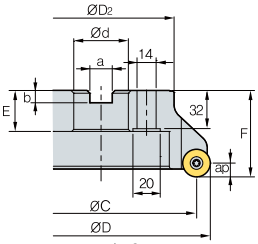


Fig.3

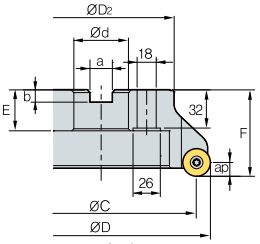


Fig.4

- AR : 5°
- RR : -1°~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.	Insert size
FMRCA	**5250HRP-4**	4	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.31	0.95	1	0.630
	5250HRP-5	5	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.31	0.97	1	0.630
	5300HRP-5	5	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.31	1.70	1	0.630
	5300HRP-6	6	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.31	1.81	1	0.630
	5400HRP-6	6	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.31	3.13	1	0.630
	5500HRP-7	7	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.31	6.13	1	0.630
	5500HRP-8	8	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.31	6.15	1	0.630
	5600RP-8	8	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.31	8.84	2	0.630

Available Inserts


RPCT-MA


RPMT-ML


RPMT-MF


RPMT-MM


RPMW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	**1606M0-MA**														●	E13
RPET	**1606M0E-ML**										●	●				
RPMT	**1606M0E-MF**						●				●	●				
	1606M0S-MM						●				●	●				
RPMW	**1606M0S1**						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø2.500~Ø6.000	FTGA0512-P	TW20-100	Ø2.500~Ø6.000

Available Inserts **E13**

FMRCA6000

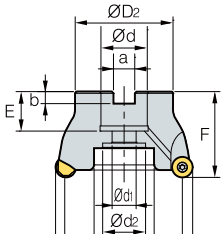


Fig.1

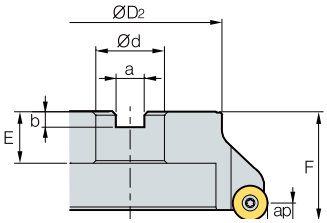


Fig.2

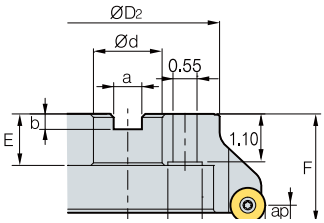


Fig.3

- AR : 5°
- RR : -1°~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.	Insert size
FMRCA	6250HRP-4	4	2.500	63.500	2.205	1.000	0.551	0.787	-	0.374	0.248	0.787	1.750	0.39	0.82	1	0.787
	6300HRP-5	5	3.000	76.200	2.205	1.000	0.551	0.827	-	0.374	0.248	0.866	2.000	0.39	1.92	1	0.787
	6400HRP-5	5	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.39	2.89	1	0.787
	6400HRP-6	6	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.39	3.09	1	0.787
	6500HRP-5	5	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.39	6.11	1	0.787
	6500HRP-7	7	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.39	6.37	1	0.787
	6600RP-6	6	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.39	7.89	2	0.787
	6600RP-8	8	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.39	7.78	2	0.787
	6800RP-8	8	8.000	203.200	5.118	2.500	-	-	-	1.000	0.551	1.496	2.500	0.39	11.36	3	0.787
	61000RP-9	9	10.000	254.000	7.087	2.500	-	-	-	1.000	0.551	1.496	2.500	0.39	21.43	3	0.787

Available Inserts


RPCT-MA


RPMT-ML


RPMT-MF


RPMT-MM


RPMW

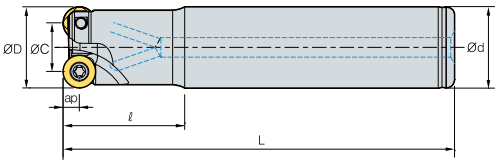
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	2007M0-MA														●	E13
RPET	2007M0E-ML										●	●				
RPMT	2007M0E-MF						●				●	●				
	2007M0S-MM						●				●	●				
RPMW	2007M0S1						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø2.500~Ø10.000	FTKA0615-P	TW25-100	Ø2.500~Ø10.000

Available Inserts E13

FMRSA2500 New



- AR : -4°
- RR : -4°~-1°

(inch)

Designation			ØD(inch)	ØD(mm)	Ød	ℓ	L	ap	lbs	Insert size
FMRSA	25068HRP-2S062	2	0.688	17.463	0.625	1.378	3.543	0.16	0.24	0.315
	25068HRP-2M062	2	0.688	17.463	0.625	1.378	5.906	0.16	0.44	0.315
	25068HRP-2L062	2	0.688	17.463	0.625	1.378	7.874	0.16	0.60	0.315
	25075HRP-3S075	3	0.750	19.050	0.750	1.378	5.118	0.16	0.60	0.315
	25075HRP-3M075	3	0.750	19.050	0.750	3.937	7.087	0.16	0.79	0.315
	25075HRP-3L075	3	0.750	19.050	0.750	5.118	9.843	0.16	1.10	0.315
	25081HRP-3S075	3	0.813	20.638	0.750	1.378	5.118	0.16	0.62	0.315
	25081HRP-3M075	3	0.813	20.638	0.750	1.378	7.087	0.16	0.88	0.315
	25081HRP-3L075	3	0.813	20.638	0.750	1.378	9.843	0.16	1.21	0.315
	25100HRP-4S100	4	1.000	25.400	1.000	1.378	5.906	0.16	1.06	0.315
	25100HRP-4M100	4	1.000	25.400	1.000	2.362	7.087	0.16	1.32	0.315
	25100HRP-4L100	4	1.000	25.400	1.000	5.118	9.843	0.16	1.79	0.315
	25106HRP-4S100	4	1.063	26.988	1.000	1.378	5.906	0.16	1.06	0.315
	25106HRP-4L100	4	1.063	26.988	1.000	5.118	9.843	0.16	1.87	0.315

Available Inserts

RPET-ML

RPMT-MF

RPMT-MM

RPMW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPET	0803M0E-ML										●	●				E13
RPMT	0803M0E-MF						●				●	●				
	0803M0S-MM						●				●	●				
RPMW	0803M0E1						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø0.688	FTNA0305	TW09S	Ø0.688
Ø0.750~Ø1.063	FTNA0306		Ø0.750~Ø1.063

Available Inserts E13

FMRSA3000 New

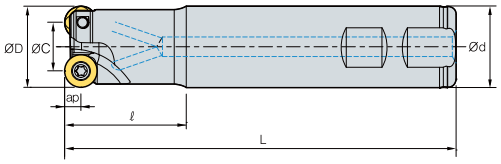


Fig. 1

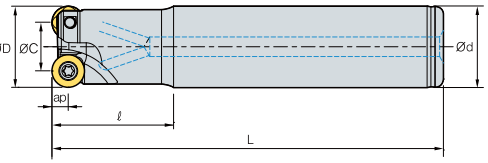


Fig. 2

- AR : -4°
- RR : -1°

(inch)

Designation			ØD(inch)	ØD(mm)	Ød	ℓ	L	ap	lbs	Fig.	Insert size
FMRSA	**3100HRP-2M075**	2	1.000	25.400	0.750	1.575	6.693	0.20	0.88	2	0.394
	3100HRP-2S100	2	1.000	25.400	1.000	1.575	4.724	0.20	0.86	1	0.394
	3100HRP-2M100	2	1.000	25.400	1.000	2.362	6.299	0.20	1.15	2	0.394
	3100HRP-2L100	2	1.000	25.400	1.000	5.118	9.843	0.20	1.76	2	0.394
	3106HRP-2L100	2	1.063	26.988	1.000	1.181	7.874	0.20	1.52	2	0.394
	3125HRP-3S125	3	1.250	31.750	1.250	1.575	4.921	0.20	1.50	1	0.394
	3125HRP-3L125	3	1.250	31.750	1.250	2.362	7.874	0.20	2.38	2	0.394
	3125HRP-4S125	4	1.250	31.750	1.250	1.575	4.921	0.20	1.46	1	0.394
	3125HRP-4L100	4	1.250	31.750	1.250	2.362	7.874	0.20	1.63	2	0.394
	3131HRP-4S125	4	1.313	33.338	1.250	1.575	4.921	0.20	1.48	1	0.394
	3131HRP-4M125	4	1.313	33.338	1.250	2.362	7.087	0.20	2.21	2	0.394
	3131HRP-4L125	4	1.313	33.338	1.250	7.087	11.811	0.20	3.62	2	0.394

Available Inserts

RPCT-MA

RPET-ML

RPMT-MF

RPMT-MM

RPMW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	**10T3M0-MA**														●	E13
RPET	**10T3M0E-ML**										●	●				
RPMT	**10T3M0E-MF**						●				●	●				
	10T3M0S-MM						●				●	●				
RPMW	**10T3M0E1**						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.000~Ø1.063	FTGA03507	TW15S	Ø1.000~Ø1.063
Ø1.250~Ø1.313	FTGA03508		Ø1.250~Ø1.313

Available Inserts **E13**

FMRSA4000 Neu

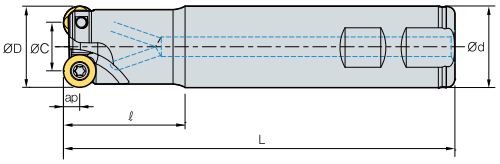


Fig. 1

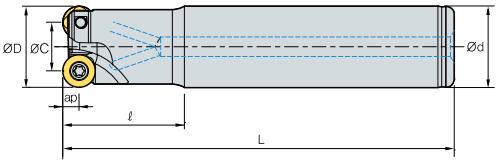


Fig. 2

- AR : -4°
- RR : -2°~ 0°

(inch)

Designation		⊚	ØD(inch)	ØD(mm)	Ød	ℓ	L	ap	lbs	Fig.	Insert size
FMRSA	4100HRP-2S100	2	1.000	25.400	1.000	2.362	6.299	0.24	1.01	1	0.472
	4106HRP-2L100	2	1.063	26.988	1.000	2.362	7.874	0.24	1.06	2	0.472
	4125HRP-2L100	2	1.250	31.750	1.000	1.575	7.480	0.24	1.50	2	0.472
	4125HRP-2S125	2	1.250	31.750	1.250	1.969	4.921	0.24	1.41	1	0.472
	4125HRP-2L125	2	1.250	31.750	1.250	1.969	9.843	0.24	3.09	2	0.472
	4125HRP-3S125	3	1.250	31.750	1.250	1.969	4.921	0.24	1.41	1	0.472
	4125HRP-3M125	3	1.250	31.750	1.250	2.362	6.299	0.24	1.87	2	0.472
	4131HRP-3M125	3	1.313	33.338	1.250	2.362	7.874	0.24	2.23	2	0.472
	4131HRP-3L125	3	1.313	33.338	1.250	2.362	11.811	0.24	3.68	2	0.472
	4150HRP-3S125	3	1.500	38.100	1.250	1.378	4.134	0.24	1.32	1	0.472
	4150HRP-3M125	3	1.500	38.100	1.250	1.969	6.299	0.24	2.12	2	0.472
	4150HRP-4S125	4	1.500	38.100	1.250	1.378	4.134	0.24	1.32	1	0.472
	4150HRP-4M125	4	1.500	38.100	1.250	1.378	5.906	0.24	1.92	2	0.472
	4150HRP-4L125	4	1.500	38.100	1.250	1.378	9.843	0.24	3.22	2	0.472
	4200HRP-4M125	4	2.000	50.800	1.250	1.969	5.906	0.24	2.43	2	0.472
	4200HRP-4M150	4	2.000	50.800	1.500	1.969	5.906	0.24	3.18	2	0.472

Available Inserts

RPCT-MA

RPET-ML

RPMT-MF

RPMT-MM

RPMW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
RPCT	1204M0-MA														●	E13
RPET	1204M0E-ML										●	●				
RPMT	1204M0E-MF						●				●	●				
	1204M0S-MM						●				●	●				
RPMW	1204M0S1						●				●	●				
	1204M0S2										●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.000~Ø1.063	FTKA0408	TW15S	Ø1.000~Ø1.063
Ø1.250~Ø1.313	FTKA0410		Ø1.250~Ø1.313

Available Inserts E13

FMRSA5000 / 6000 Neu

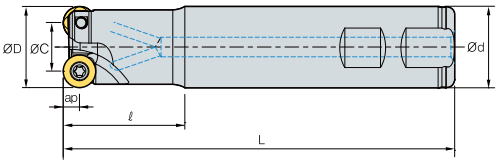


Fig. 1

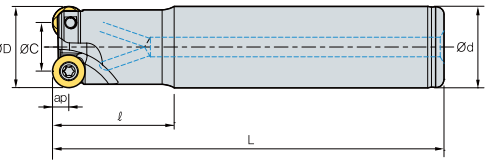


Fig. 2

- AR : -4°
- RR : -2° ~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	Ød	ℓ	L	ap	lbs	Insert size	Fig.
FMRSA	5150HRP-2M125	2	1.500	38.100	1.250	1.969	6.299	0.31	2.03	2	0.630
	5150HRP-2L125	2	1.500	38.100	1.250	1.969	9.843	0.31	3.20	2	0.630
	5200HRP-3M150	3	2.000	50.800	1.500	1.969	6.299	0.31	3.26	2	0.630
	5200HRP-3L150	3	2.000	50.800	1.500	1.969	11.811	0.31	6.31	2	0.630
	6200HRP-3S125	3	2.000	50.800	1.250	1.969	6.299	0.39	2.34	1	0.787
	6200HRP-3M125	3	2.000	50.800	1.250	1.969	7.874	0.39	2.87	2	0.787
	6200HRP-3S150	3	2.000	50.800	1.500	1.969	4.921	0.39	3.20	1	0.787
	6200HRP-3M150	3	2.000	50.800	1.500	1.969	7.874	0.39	4.08	2	0.787

Available Inserts

RPCT-MA

RPET-ML

RPMT-MF

RPMT-MM

RPMW

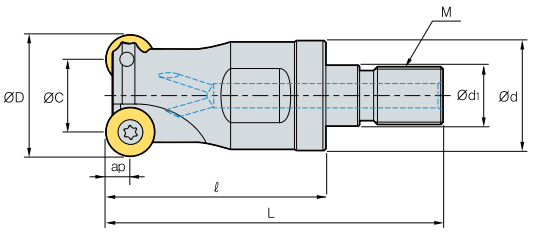
Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
5000 type	RPCT	1606M0-MA														●	E13
	RPET	1606M0E-ML										●	●				
	RPMT	1606M0E-MF						●				●	●				
		1606M0S-MM						●				●	●				
	RPMW	1606M0S1						●				●	●				
6000 type	RPCT	2007M0-MA														●	E13
	RPMT	2007M0E-ML										●	●				
		2007M0E-MF						●				●	●				
		2007M0S-MM						●				●	●				
	RPMW	2007M0S1						●				●	●				

Parts

Specification	Screw	Wrench	Cutter Dia.
Ø1.500~Ø2.000 (5000type)	FTGA0511-P	TW20-100	Ø1.500~Ø2.000
Ø2.000 (6000 type)	FTKA0615-P	TW25-100	Ø2.000

Available Inserts E13

FMRMA2500 / 3000 / 4000 / 5000 New



- AR : -4°
- RR : -4°~ 0°

(inch)

Designation			ØD(inch)	ØD(mm)	Ød	Ød1	ℓ	L	M	ap	lbs	Insert size
FMRMA	25068HRP-M08	2	0.688	17.463	0.571	0.335	0.984	1.654	M08	0.16	0.07	0.315
	25075HRP-M10	3	0.750	19.050	0.709	0.413	1.181	2.008	M10	0.16	0.13	0.315
	25100HRP-M12	4	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.16	0.24	0.315
	25125HRP-M16	4	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.16	0.49	0.315
	25150HRP-M16	5	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.16	0.57	0.315
	3100HRP-M12	2	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.20	0.22	0.394
	3125HRP-M16	3	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.20	0.44	0.394
	3150HRP-M16	3	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.20	0.55	0.394
	4100HRP-M12	2	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.24	0.22	0.472
	4125HRP-M16	3	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.24	0.46	0.472
	4150HRP-M16	4	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.24	0.53	0.472
	5150HRP-M16	2	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.31	0.46	0.630

Available Inserts


RPCT-MA


RPET-ML


RPMT-MF


RPMT-MM


RPMW

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2500 type	RPET	0803M0E-ML										●	●				E13
	RPMT	0803M0E-MF						●				●	●				
		0803M0S-MM						●				●	●				
	RPMW	0803M0E1						●				●	●				
3000 type	RPCT	10T3M0-MA														●	E13
	RPET	10T3M0E-ML										●	●				
	RPMT	10T3M0E-MF						●				●	●				
		10T3M0S-MM						●				●	●				
	RPMW	10T3M0E1						●				●	●				
4000 type	RPCT	1204M0-MA														●	E13
	RPET	1204M0E-ML										●	●				
	RPMT	1204M0E-MF						●				●	●				

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
4000 type	RPMT	1204M0S-MM						●				●	●				E13
	RPMW	1204M0S1						●				●	●				
		1204M0S2										●	●				
5000 type	RPCT	1606M0-MA														●	E13
	RPET	1606M0E-ML										●	●				
	RPMT	1606M0E-MF						●				●	●				
		1606M0S-MM						●				●	●				
	RPMW	1606M0S1						●				●	●				

Parts

Specification	Screw	Wrench	Wrench	Cutter Dia.
Ø0.688 (2500type)	FTNA0305	TW09S	-	Ø0.688
Ø0.750~Ø1.500 (2500type)	FTNA0306			Ø0.750~Ø1.500
Ø1.000 (3000type)	FTGA03507	TW15S	-	Ø1.000
Ø1.250~Ø1.500 (3000type)	FTGA03508			Ø1.250~Ø1.500
Ø1.000 (4000type)	FTKA0408	TW15S	-	Ø1.000
Ø1.250~Ø1.500 (4000type)	FTKA0410			Ø1.250~Ø1.500
Ø1.500 (5000type)	FTGA0511-P	-	TW20-100	Ø1.500

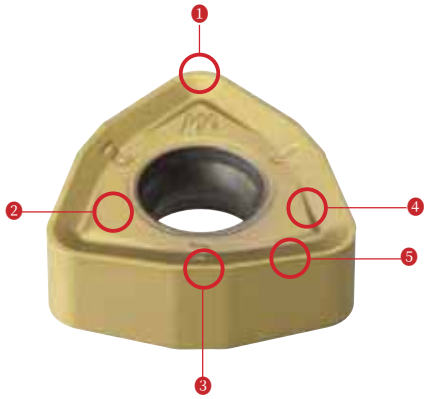
Available Inserts E13 Available Adaptor E252~E253

HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with a 3 edge positive insert

HRMDouble

- HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with a 3 edge positive insert
- High rake angle cutting edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting edge and double sided function
- Simple screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting edge is applicable for both R and L type machining

Features of Insert



❶ Nose-R

- Security of rigid edge in ramping Pocket machining
- Round edge suitable for high feed rates Insert geometry
- Possible to use R/L type machining

❷ Clamping surface

- Design for stable clamping
- Prevention of friction by chip

❸ Minor cutting edge

- Improvement of surface roughness in high feed machining
- Special design for decreasing thrust force
- Symmetrical insert design for R/L type tool

❹ Chip breaker

- Reduction of cutting load due to high rake angle
- Improvement of chip flow and evacuation in various applications
- Prevention of damage on clamping face of insert

❺ Major cutting edge

- Symmetrical design insert for R/L type tool
- Superior cutting performance due to high rake angle cutting edge
- Low cutting resistance in high feed
- Special design for decreasing thrust force

Features of Cutter

Inner coolant system

- Improvement of chip control and evacuation
- Longer tool life due to reduced cutting temperature

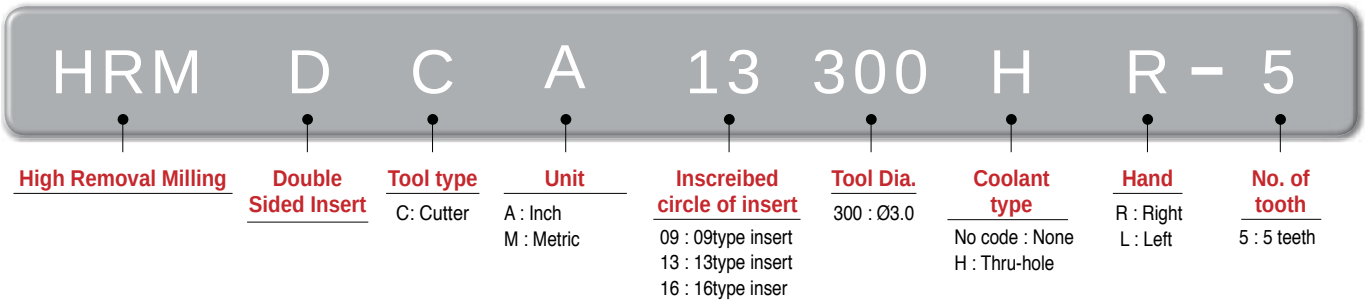
3-surface constrained system

- Strong clamping system
- Stable clamping system against different cutting resistances in various machining applications

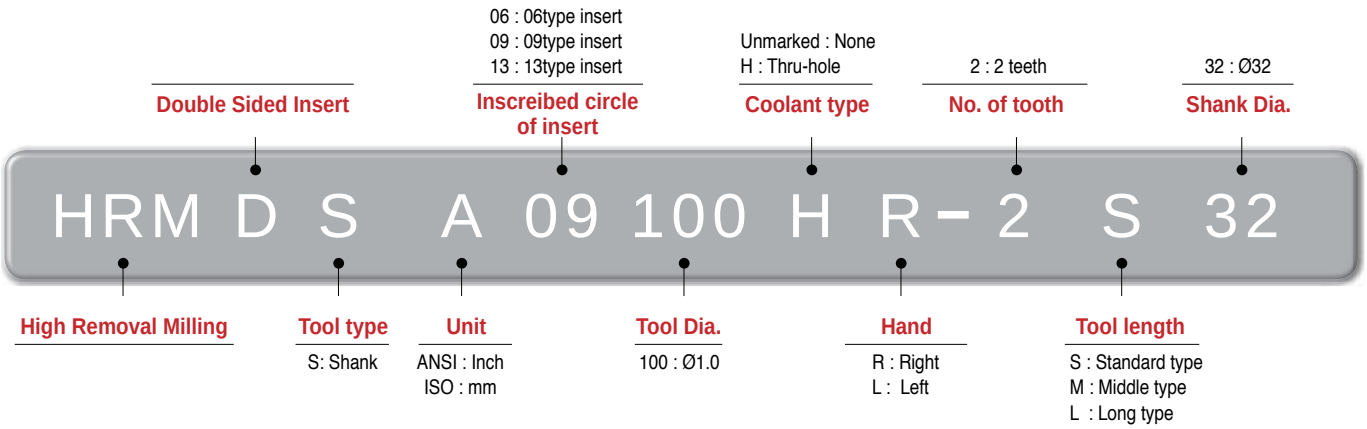
Simple screw on system

- Strong clamping of screw on system
- Convenient clamping system
- Wide chip pocket for better chip evacuation

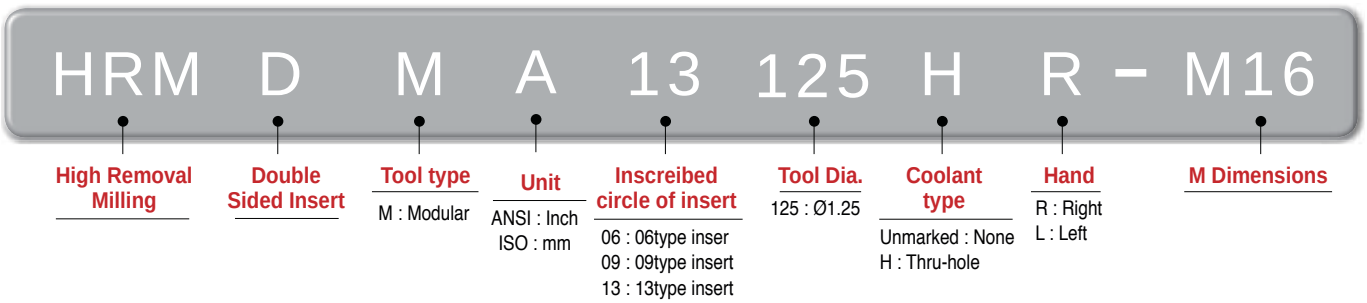
Cutter type Code system



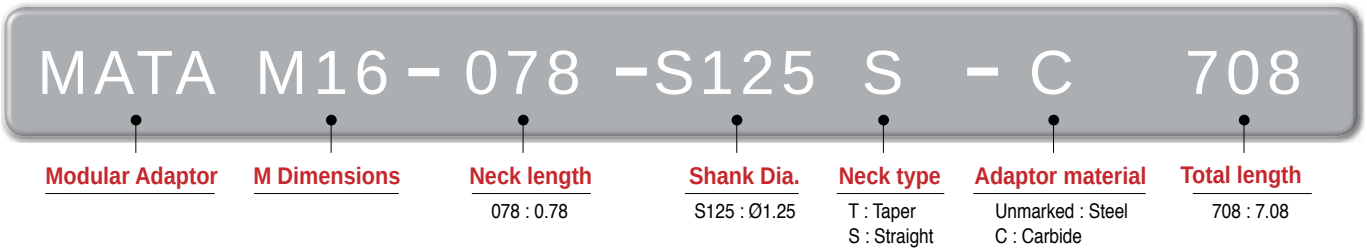
Shank type Code system



Modular Head Code system



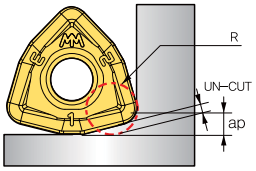
Modular Adaptor Code system



Corner R programming

Designation	Cutting condition		Approx. R (inch)	
	Max.ap(inch)	Max.fz(ipt)	Input. R	Uncut
WNMX060312ZNN-MM	0.04	0.05	0.07	0.015
WNMX09T316ZNN-MM	0.06	0.08	0.10	0.024
WNMX130520ZNN-MM	0.08	0.12	0.12	0.032
WNMX160720ZNN-MM	0.10	0.14	0.14	0.047

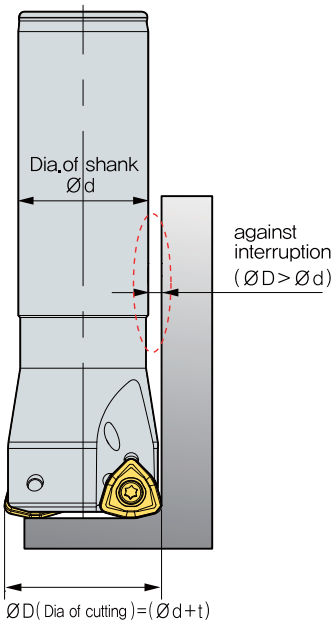
·Information for uncut part by using "Input.R" for CAM program



·Uncut part can be changed by poor machine condition or weak clamp of workpiece, etc

Interference prevent system

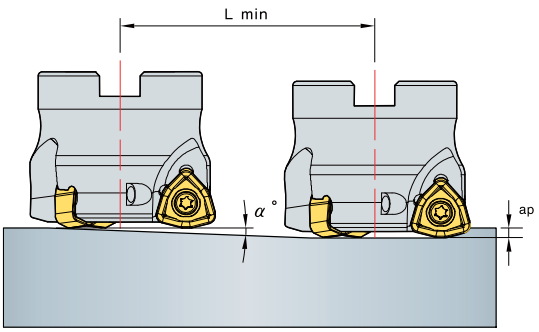
Designation	ØD(inch)	Ød(inch)	t(inch)
HRMDSA06068HR-2□ 062	0.6880	0.625	0.063
HRMDSA06087HR-2□ 075	0.8750	0.750	0.125
HRMDSA06112HR-3□ 100	1.1250	1.000	0.125
HRMDSA06137HR-4□ 125	1.3750	1.250	0.125
HRMDSA09106HR-2□ 100	1.0625	1.000	0.060
HRMDSA09131HR-3□ 125	1.3125	1.250	0.060
HRMDSA09137HR-4□ 125	1.3750	1.250	0.130
HRMDSA09150HR-4□ 125	1.5000	1.250	0.250
HRMDSA09200HR-4□ 150	2.0000	1.500	0.500
HRMDSA13131HR-2□ 125	1.3130	1.250	0.060
HRMDSA13137HR-2□ 125	1.3750	1.250	0.130
HRMDSA13150HR-3□ 125	1.5000	1.250	0.250
HRMDSA13162HR-3□ 125	1.6250	1.250	0.380
HRMDSA13162HR-3□ 150	1.6250	1.500	0.130
HRMDSA13200HR-3□ 150	2.0000	1.500	0.500
HRMDSA13250HR-4□ 150	2.5000	1.500	1.000



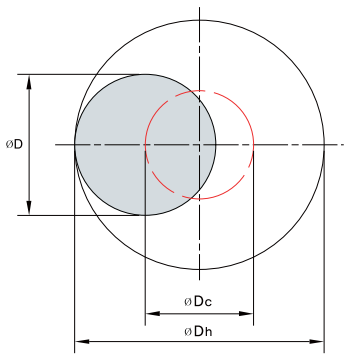
•The side clearance prevents to interference between tool and workpiece even in deep hole machining

Ramping & Helical cutting technical data

Ramping



Helical cutting



$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

$$ØDc = ØDh - ØD$$

ØDc = Tool pass of tool center
ØDh = Desirable hole diameter on workpiece
ØD = Tool Dia.

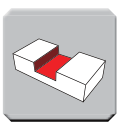
- Adjust feed to under 70% of Recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size

Designation		Tool 1.457	Efficient cutting diameter ØDe(inch)	Ramping			Helical ramping	
				Max. ap(inch)	Max. angle α°	Cutting Length Lmin (inch)	Dh Min. Cutting diameter(mm) (inch)	Dh Max. Cutting diameter(inch)
HRMDSA	06068HR	0.688	0.433	0.039	3.7	0.603	1.052	1.281
	06075HR	0.750	0.495	0.039	3.3	0.676	1.177	1.406
	06087HR	0.875	0.619	0.039	2.1	1.063	1.427	1.656
	06100HR	1.000	0.741	0.039	2.6	0.858	1.677	1.909
	06112HR	1.125	0.866	0.039	1.9	1.175	1.927	2.156
	06125HR	1.250	0.992	0.039	0.6	3.724	2.177	2.406
	06137HR	1.375	1.115	0.039	0.4	5.586	2.427	2.656
HRMDSA	09100HR-2□□□	1.000	0.606	0.059	5.4	0.622	1.480	1.843
	09106HR-2□□□	1.063	0.646	0.059	5.0	0.669	1.559	1.921
	09118HR-3□□□	1.188	0.803	0.059	3.9	0.866	1.874	2.236
	09125HR-3□□□	1.250	0.878	0.059	3.5	0.965	2.031	2.394
	09131HR-3□□□	1.313	0.917	0.059	3.3	1.016	2.110	2.472
	09137HR-4□□□	1.375	1.000	0.059	3.0	1.114	2.268	2.630
	09150HR-4□□□	1.500	1.125	0.059	2.5	1.351	2.512	2.874
	09162HR-4□□□	1.625	1.189	0.059	2.5	1.358	2.661	3.024
	09200HR-□□□□	2.000	1.583	0.059	1.8	1.850	3.449	3.811
	13125HR-2□□□□	1.250	0.760	0.079	5.7	0.787	1.850	2.362
	13131HR-2□□□□	1.313	0.799	0.079	5.4	0.839	1.929	2.441
	13137HR-2□□□□	1.375	0.878	0.079	4.8	0.945	2.087	2.598
	13150HR-3□□□□	1.500	0.996	0.079	3.7	1.222	2.331	2.843
	13162HR-3□□□□	1.625	1.071	0.079	3.7	1.209	2.480	2.992
	13200HR-□□□□	2.000	1.457	0.079	2.6	1.732	3.268	3.780
	13250HR-□□□□	2.500	1.969	0.079	1.9	2.413	4.291	4.803
HRMDCA	09200HR-□	2.000	1.583	0.059	1.8	1.850	3.449	3.811
	09250HR-□	2.500	2.091	0.059	1.4	2.492	4.472	4.835
	09300HR-□	3.000	2.760	0.059	1.0	3.327	5.811	6.173
	09400HR-□	4.000	3.543	0.059	0.8	4.311	7.386	7.748
	13200HR-□	2.000	1.457	0.079	2.6	1.732	3.268	3.780
	13250HR-□	2.500	1.969	0.079	1.9	2.413	4.291	4.803
	13300HR-□	3.000	2.634	0.079	1.4	3.307	5.630	6.142
	13400HR-□	4.000	3.421	0.079	1.0	4.358	7.205	7.717
	13500HR-□	5.000	4.406	0.079	0.8	4.488	9.173	9.685
HRMDCA	16300HR-□	3.000	2.343	0.098	1.5	3.742	5.134	5.843
	16400HR-□	4.000	3.344	0.098	1.0	5.614	7.134	7.843
	16500HR-□	5.000	4.345	0.098	0.8	7.018	9.134	9.843
	16600R-□	6.000	5.345	0.098	0.6	9.357	11.134	11.843
	16800R-□	8.000	7.346	0.098	0.3	18.716	15.134	15.843
	161000R-□	10.000	9.346	0.098	0.2	28.074	19.134	19.843
	161200R-□	12.000	11.346	0.098	0.1	56.149	23.134	23.843

Application area


Copying

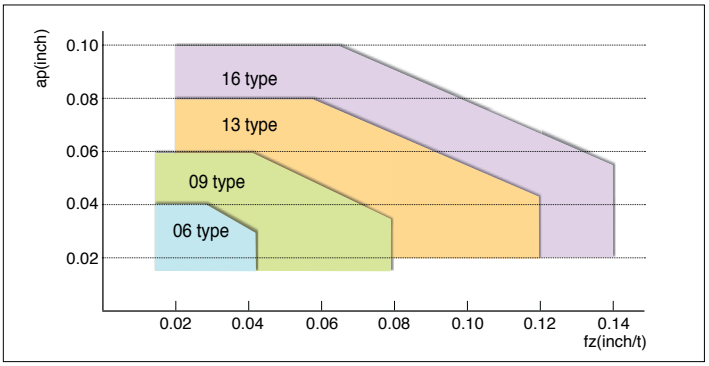

Facing


Slotting


Ramping


Helical cutting


Through coolant system



Recommended cutting condition

ISO	Workpiece		Material	Grade	Cutting speed, vc(sfm)
P	Carbon steel	Low carbon steel	1213, C=0.1~25	PC5300	919
				PC5400	804
		General carbon steel	C=0.30~55	PC5300	837
				PC5400	722
		High carbon steel	C=0.55~80	PC5300	787
				PC5400	673
	Low alloy steel (Alloy constituent < 5%)	-	4115, 4120, 4140	PC5300	640
				PC5400	558
		Hardened	-	PC5300	377
				PC5400	328
	High alloy steel (Alloy constituent > 5%)	annealed	H13	PC5300	492
				PC5400	427
		Hardened	M2, M35	PC5300	394
				PC5400	344
M	Stainless steel	Ferritic / martensitic	S41000, S42000, S43000	PC5300	525
				PC5400	443
		Austenitic	S30300, S30400, S31600	PC5300	427
				PC5400	361
		Duplex(Austenitic / Ferrictic)	31803	PC5300	328
				PC5400	279
K	Gray cast iron	Low tensile	No30B, No35B	PC5300	476
				PC5400	361
		Hight tensile	No45B, No50B	PC5300	394
				PC5400	295
		Ferric	60-40-18, 80-55-06	PC5300	312
				PC5400	230
		Pearlitic	80-55-06, 100-70-03	PC5300	279
				PC5400	213
S	Fe Base	-	Incoloy	PC5300	197
				PC5400	164
	Ni Base	-	Inconel, Nimonic, Hastelloy	PC5300	180
				PC5400	148
	Co base	-	stelite	PC5300	82
				PC5400	66
	Titanium alloys	-	pure Ti	PC5300	427
				PC5400	344
			alloy(TiAl6V4)	PC5300	213
				PC5400	180

Machining Example

Working condition

Work piece : AISI 1045 (SM45C, HRC22)
Cutting speed : vc = 930sfm
fz = 0.055ipt
vf = 398ipm
ap = 0.032inch
ae = 1.378inch
Coolant : Dry, Machining: Copying
Machine : Horizontal MCT
Overhang of tool : 10inch

Tool information : HRMDCM13050HR-4
WNMX130520ZNN-MM(PC3500)

40% Increased productivity
80% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 40% and the tool life was increased to over 60%. HRMD is economically more efficient due to the use of 6 cutting edges compared to EDNW type with positive insert

Working condition

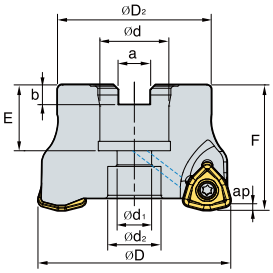
Work piece : AISI 304 (STS304)
Cutting speed : vc = 430sfm
fz = 0.047ipt
vf = 117ipm
ap = 0.04inch
ae = 3.15inch
Coolant : Wet, Machining : Facing and Slotting
Machine : Facing and Slotting
Overhang of tool : 10inch

Tool information : HRMDCM13100HR-6
WNMX130520ZNN-MM(PC3545)

80% Increased productivity
25% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 80% and the tool life was same, but HRMD is economically more efficient due to the use of 6 cutting edges compared to SDKN type with positive insert

HRMDCA09



AA 76°

- AR : -7°
- RR : -12°~-18°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
HRMDCA	**09200HR-4**	4	2.000	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	0.662	3/8-24UNF
	09200HR-5	5	2.000	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	0.662	3/8-24UNF
	09250HR-5	5	2.500	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	1.103	3/8-24UNF
	09250HR-6	6	2.500	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	1.103	3/8-24UNF
	09300HR-6	6	3.000	2.205	1.000	0.551	0.827	0.374	0.248	0.866	2.00	0.06	3.308	1/2-20UNF
	09300HR-7	7	3.000	2.205	1.000	0.551	0.827	0.374	0.248	0.866	2.00	0.06	3.308	1/2-20UNF
	09400HR-7	7	4.000	2.874	1.250	0.709	1.024	0.500	0.319	0.866	2.00	0.06	4.631	5/8-18UNF
	09400HR-8	8	4.000	2.874	1.250	0.709	1.024	0.500	0.319	0.866	2.00	0.06	4.631	5/8-18UNF

Available Inserts

WNMX-MF

WNMX-MM

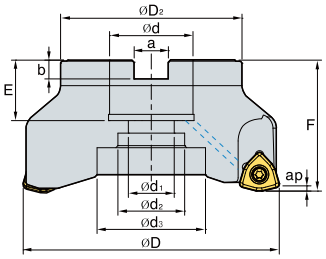
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	**09T316ZNN-MF**						●				●	●				E22
	09T316ZNN-MM					●	●		●		●	●				

Parts

Specification	Screw	Wrench
Ø2.000~Ø4.000	FTKA0307	TW09S

Available Inserts **E22**

HRMDCA13



AA 76°

- AR : -7°
- RR : -12° ~ -4°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Bolt
HRMDCA	**13200HR-3**	3	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	0.662	3/8-24UNF
	13200HR-4	4	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	0.662	3/8-24UNF
	13250HR-4	4	2.5	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	1.103	3/8-24UNF
	13250HR-5	5	2.5	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	1.103	3/8-24UNF
	13300HR-5	5	3.0	2.205	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.08	2.205	1/2-20UNF
	13300HR-6	6	3.0	2.205	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.08	2.205	1/2-20UNF
	13400HR-6	6	4.0	2.874	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.08	3.528	5/8-18UNF
	13400HR-7	7	4.0	2.874	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.08	3.528	5/8-18UNF
	13500HR-7	7	5.0	3.433	1.50	0.827	1.220	2.125	0.626	0.394	1.181	2.50	0.08	4.410	3/4-16UNF
	13500HR-8	8	5.0	3.433	1.50	0.827	1.220	2.125	0.626	0.394	1.181	2.50	0.08	4.410	3/4-16UNF

Available Inserts

WNMX-MF

WNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	**130520ZNN-MF**										●	●				E22
	130520ZNN-MM					●	●	●	●		●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTKA0412B	TW15S

Available Inserts E22

HRMDCA16 New

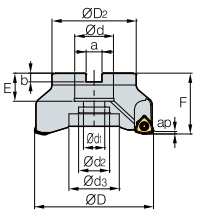


Fig. 1

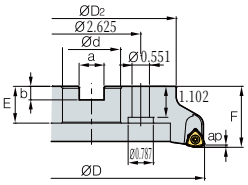


Fig. 2

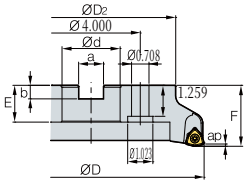


Fig. 3

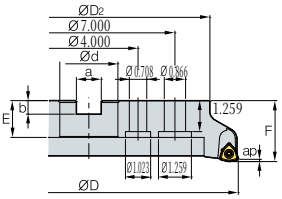


Fig. 4







- AR : -7°
- RR : -12°~-4°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Bolt	Fig.
HRMDCA	**16300HR-4**	4	3.0	2.362	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.098	1.94	1/2-20UNF	1
	16300HR-5	5	3.0	2.362	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.098	1.81	1/2-20UNF	1
	16400HR-5	5	4.0	3.346	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.098	3.77	5/8-18UNF	1
	16400HR-6	6	4.0	3.346	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.098	3.86	5/8-18UNF	1
	16500HR-6	6	5.0	3.937	1.50	0.827	1.220	2.205	0.626	0.394	1.181	2.50	0.098	7.23	3/4-16UNF	1
	16500HR-7	7	5.0	3.937	1.50	0.827	1.220	2.205	0.626	0.394	1.181	2.50	0.098	7.25	3/4-16UNF	1
	16600R-7	7	6.0	5.039	2.00	-	3.543	-	0.752	0.433	1.181	2.50	0.098	8.99	1-14UNF	2
	16600R-8	8	6.0	5.039	2.00	-	3.543	-	0.752	0.433	1.181	2.50	0.098	9.13	1-14UNF	2
	16800R-8	8	8.0	5.701	2.50	-	5.197	-	1.000	0.551	1.496	2.50	0.098	14.7	-	3
	16800R-10	10	8.0	5.701	2.50	-	5.197	-	1.000	0.551	1.496	2.50	0.098	14.79		3
	161000R-10	10	10.0	7.480	2.50	-	7.087	-	1.000	0.551	1.496	2.50	0.098	24.98	-	3
	161000R-12	12	10.0	7.480	2.50	-	7.087	-	1.000	0.551	1.496	2.50	0.098	24.89		3
	161200R-12	12	12.0	9.646	2.50	-	9.370	-	1.000	0.551	1.496	2.50	0.098	37.15	-	4
	161200R-14	14	12.0	9.646	2.50	-	9.370	-	1.000	0.551	1.496	2.50	0.098	37.39		4

Available Inserts

WNMX-MF


WNMX-MM

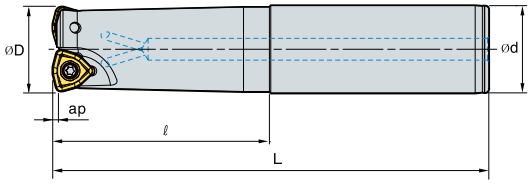
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	**160720ZNN-MF**										●	●				E22
	160720ZNN-MM										●	●				

Parts

Specification	Screw	Wrench
Ø3.0~Ø12.0	FTGA0513-P	TW20-100

Available Inserts **E22**

HRMDSA06 New









- AR : -7°
- RR : -17°~ -25°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	06068HR-2S062	2	0.688	0.625	0.787	4.331	0.039	0.32
	06068HR-2M062	2	0.688	0.625	0.787	5.906	0.039	0.44
	06068HR-2L062	2	0.688	0.625	0.787	7.874	0.039	0.60
	06075HR-2S075	2	0.750	0.750	1.969	5.118	0.039	0.55
	06075HR-2M075	2	0.750	0.750	3.937	7.087	0.039	0.75
	06075HR-2L075	2	0.750	0.750	5.118	9.843	0.039	1.06
	06087HR-2S075	2	0.875	0.750	0.787	5.118	0.039	0.59
	06087HR-2M075	2	0.875	0.750	0.787	7.087	0.039	0.82
	06087HR-2L075	2	0.875	0.750	0.787	9.843	0.039	1.14
	06100HR-3S100	3	1.000	1.000	2.362	5.512	0.039	1.01
	06100HR-3M100	3	1.000	1.000	3.150	7.087	0.039	1.31
	06100HR-3L100	3	1.000	1.000	4.724	9.843	0.039	1.84
	06112HR-3S100	3	1.125	1.000	1.181	5.512	0.039	1.09
	06112HR-3M100	3	1.125	1.000	1.181	7.087	0.039	1.40
	06112HR-3L100	3	1.125	1.000	1.181	9.843	0.039	1.95
	06125HR-4S125	4	1.250	1.250	2.756	5.906	0.039	1.76
	06125HR-4M125	4	1.250	1.250	3.937	7.874	0.039	2.38
	06125HR-4L125	4	1.250	1.250	7.087	11.811	0.039	3.58
	06137HR-4S125	4	1.375	1.250	1.575	7.874	0.039	2.53
	06137HR-4M125	4	1.375	1.250	1.575	9.843	0.039	3.17
	06137HR-4L125	4	1.375	1.250	1.575	11.811	0.039	3.81

Available Inserts

WNMX-MF

WNMX-MM

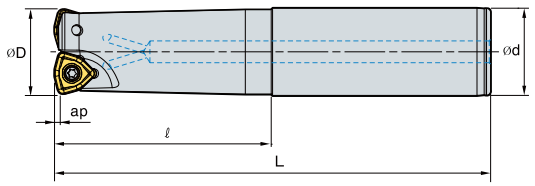
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF										●	●				E22
	060312ZNN-MM										●	●				

Parts

Specification	Screw	Wrench
Ø0.688~Ø1.375	ETNA02506	TW07S

Available Inserts E22

HRMDSA09



AA 76°

- AR : -7°
- RR : -17°~-25°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	09100HR-2S100	2	1.0000	1.00	2.362	5.512	0.06	1.103
	09100HR-2M100	2	1.0000	1.00	4.724	7.874	0.06	1.323
	09100HR-2L100	2	1.0000	1.00	7.087	11.811	0.06	2.205
	09106HR-2S100	2	1.0625	1.00	2.362	5.512	0.06	1.103
	09106HR-2M100	2	1.0625	1.00	2.362	7.874	0.06	1.544
	09106HR-2L100	2	1.0625	1.00	2.362	11.811	0.06	2.205
	09118HR-3S125	3	1.1875	1.25	2.756	5.906	0.06	1.764
	09118HR-3M125	3	1.1875	1.25	4.724	7.874	0.06	2.205
	09118HR-3L125	3	1.1875	1.25	7.087	11.811	0.06	3.308
	09125HR-3S125	3	1.2500	1.25	2.756	5.906	0.06	1.764
	09125HR-3M125	3	1.2500	1.25	4.724	7.874	0.06	2.426
	09125HR-3L125	3	1.2500	1.25	7.087	11.811	0.06	3.749
	09131HR-3S125	3	1.3125	1.25	2.756	5.906	0.06	1.764
	09131HR-3M125	3	1.3125	1.25	2.756	7.874	0.06	2.426
	09131HR-3L125	3	1.3125	1.25	2.756	11.811	0.06	3.749
	09137HR-4S125	4	1.3750	1.25	1.969	5.906	0.06	1.985
	09137HR-4M125	4	1.3750	1.25	1.969	7.874	0.06	2.426
	09137HR-4L125	4	1.3750	1.25	1.969	11.811	0.06	3.749
	09150HR-4S125	4	1.5000	1.25	1.969	5.906	0.06	1.985
	09150HR-4M125	4	1.5000	1.25	1.969	9.843	0.06	3.308
	09150HR-4L125	4	1.5000	1.25	1.969	11.811	0.06	3.969
	09200HR-4S150	4	2.0000	1.50	1.575	5.906	0.06	3.087
	09200HR-4M150	4	2.0000	1.50	1.575	9.843	0.06	5.292
	09200HR-4L150	4	2.0000	1.50	1.575	11.811	0.06	6.395
	09200HR-5S150	5	2.0000	1.50	1.575	5.906	0.06	3.087
	09200HR-5M150	5	2.0000	1.50	1.575	9.843	0.06	5.292
	09200HR-5L150	5	2.0000	1.50	1.575	11.811	0.06	6.395

Available Inserts

WNMX-MF

WNMX-MM

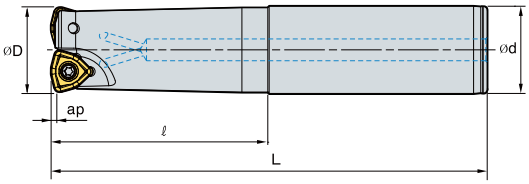
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF						●				●	●				E22
	09T316ZNN-MM					●	●		●		●	●				

Parts

Specification	Screw	Wrench
Ø1.0000~Ø2.0000	FTKA0307	TW09S

Available Inserts **E22**

HRMDSA13



AA 76°

- AR : -7°
- RR : -14° ~ -16°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	13125HR-2S125	2	1.250	1.250	2.756	5.906	0.08	1.764
	13125HR-2M125	2	1.250	1.250	4.724	7.874	0.08	2.205
	13125HR-2L125	2	1.250	1.250	7.087	11.811	0.08	3.528
	13131HR-2S125	2	1.313	1.250	2.756	5.906	0.08	1.754
	13131HR-2M125	2	1.313	1.250	2.756	7.874	0.08	2.426
	13131HR-2L125	2	1.313	1.250	2.756	11.811	0.08	3.749
	13137HR-2S125	2	1.375	1.250	1.969	5.906	0.08	1.764
	13137HR-2M125	2	1.375	1.250	1.969	7.874	0.08	2.426
	13137HR-2L125	2	1.375	1.250	1.969	11.811	0.08	3.749
	13150HR-3S125	3	1.500	1.250	1.969	5.906	0.08	1.764
	13150HR-3M125	3	1.500	1.250	1.969	9.843	0.08	3.087
	13150HR-3L125	3	1.500	1.250	1.969	11.811	0.08	3.749
	13150HR-3S150	3	1.500	1.500	2.362	5.906	0.08	2.646
	13150HR-3M150	3	1.500	1.500	5.118	9.843	0.08	4.631
	13150HR-3L150	3	1.500	1.500	7.087	11.811	0.08	5.733
	13162HR-3S125	3	1.625	1.250	1.969	5.906	0.08	1.985
	13162HR-3M125	3	1.625	1.250	1.969	9.843	0.08	2.646
	13162HR-3L125	3	1.625	1.250	1.969	11.811	0.08	3.969
	13162HR-3S150	3	1.625	1.500	1.969	5.906	0.08	2.867
	13162HR-3M150	3	1.625	1.500	1.969	9.843	0.08	4.851
	13162HR-3L150	3	1.625	1.500	1.969	11.811	0.08	5.954
	13200HR-3S150	3	2.000	1.500	1.969	5.906	0.08	2.426
	13200HR-3M150	3	2.000	1.500	1.969	9.843	0.08	3.749
	13200HR-3L150	3	2.000	1.500	1.969	11.811	0.08	4.410
	13200HR-4S150	4	2.000	1.500	1.969	5.906	0.08	3.308
	13200HR-4M150	4	2.000	1.500	1.969	9.843	0.08	5.292
	13200HR-4L150	4	2.000	1.500	1.969	11.811	0.08	6.395
	13250HR-4S150	4	2.500	1.500	1.969	5.906	0.08	3.087
	13250HR-4M150	4	2.500	1.500	1.969	9.843	0.08	4.631
	13250HR-4L150	4	2.500	1.500	1.969	11.811	0.08	5.292
	13250HR-5S150	5	2.500	1.500	1.969	5.906	0.08	3.969
	13250HR-5M150	5	2.500	1.500	1.969	9.843	0.08	6.174
	13250HR-5L150	5	2.500	1.500	1.969	11.811	0.08	7.056

Available Inserts

WNMX-MF

WNMX-MM

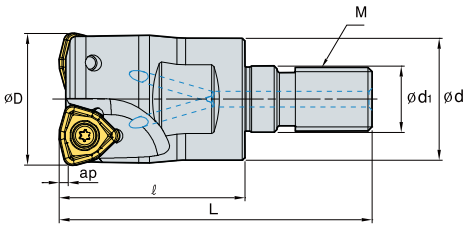
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF										●	●				E22
	130520ZNN-MM					●	●	●	●		●	●				

Parts

Specification	Screw	Wrench
Ø1.250~Ø2.500	FTKA0412B	TW15S

Available Inserts E22

HRMDMA06 New



AA 76°

- AR : -7°
- RR : -18°~-25°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
HRMDMA	06068HR-M08	2	0.688	0.571	0.335	0.984	1.654	M08	0.039	0.07
	06075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.039	0.13
	06087HR-M10	2	0.875	0.709	0.413	1.181	2.008	M10	0.039	0.15
	06100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.039	0.23
	06112HR-M12	3	1.125	0.906	0.492	1.378	2.323	M12	0.039	0.28
	06125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.039	0.45
	06137HR-M16	4	1.375	1.142	0.669	1.575	2.638	M16	0.039	0.51

Available Inserts

WNMX-MF

WNMX-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF										●	●				E23
	060312ZNN-MM										●	●				

Available Adaptor

Designation		Available Adaptor	Designation		Available Adaptor
HRMDMA	06068HR-M08	MATA- M08	HRMDMA	06112HR-M12	MATA- M12
	06075HR-M10	MATA- M10		06125HR-M16	MATA- M16
	06087HR-M10	MATA- M10		06137HR-M16	MATA- M16
	06100HR-M12	MATA- M12			

Designation : HRMDMA06125HR-M16
Modular Head Threading Measure size(M16)

=

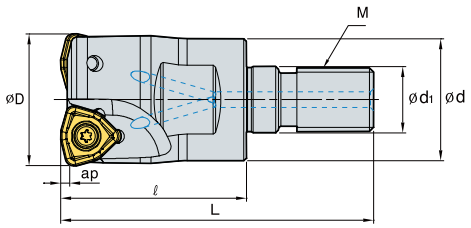
Adaptor Spec. : MATA-M16-137-S125S
Adaptor Threading Measure(M16)

Parts

Specification	Screw	Wrench
Ø0.688~Ø1.375	ETNA02506	TW07S

Available Inserts E23 Available Adaptor E252~E253

HRMDMA09 / 13



AA 76°

- AR : -7°
- RR : -18°~ -25°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
HRMDMA	09100HR-M12	2	1.000	0.906	0.492	1.378	2.323	M12	0.06	0.22
	09106HR-M12	2	1.063	0.906	0.492	1.378	2.323	M12	0.06	0.24
	09118HR-M16	3	1.188	1.142	0.669	1.575	2.638	M16	0.06	0.42
	09125HR-M16	3	1.250	1.142	0.669	1.575	2.638	M16	0.06	0.44
	09131HR-M16	3	1.313	1.142	0.669	1.575	2.638	M16	0.06	0.46
	09137HR-M16	4	1.375	1.142	0.669	1.575	2.638	M16	0.06	0.49
	09150HR-M16	4	1.500	1.142	0.669	1.575	2.638	M16	0.06	0.55
	13125HR-M16	2	1.250	1.142	0.669	1.575	2.638	M16	0.08	0.44
	13131HR-M16	2	1.313	1.142	0.669	1.575	2.638	M16	0.08	0.44
	13137HR-M16	2	1.375	1.142	0.669	1.575	2.638	M16	0.08	0.49
	13150HR-M16	3	1.500	1.142	0.669	1.772	2.835	M16	0.08	0.57

Available Inserts

WNMX-MF

WNMX-MM

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
09 type	WNMX	09T316ZNN-MF						●				●	●				E23
		09T316ZNN-MM					●	●		●		●	●				
13 type	WNMX	130520ZNN-MF										●	●				
		130520ZNN-MM					●	●	●	●		●	●				

Available Adaptor

Designation		Available Adaptor	Designation		Available Adaptor
HRMDMA	09100HR-M12	MATA- M12	HRMDMA	13125HR-M16	MATA- M16
	09106HR-M12			13131HR-M16	
	09118HR-M16	MATA- M16		13137HR-M16	
	09125HR-M16			13150HR-M16	
	09131HR-M16				
	09137HR-M16				
	09150HR-M16				

Designation : HRMDMA09125HR-M16
Modular Head Threading Measure size(M16)

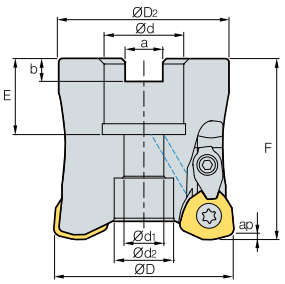
Adaptor Spec. : MATA-M16-035-S32S
Adaptor Threading Measure(M16)

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500 (09type)	FTKA0307	TW09S
Ø1.250~Ø1.500 (13type)	FTKA0412B	TW15S

Available Inserts E23 Available Adaptors E252~E253

HRMCA13 / 15



AA 75°

- AR : 7°
- RR : -15° ~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
HRMCA	13200HR-3	3	2	1.850	3 /4	0.433	0.646	0.321	0.220	0.787	1.75	0.08	0.88	3/8-24UNF
	13200HR-4	4	2	1.850	3 /4	0.433	0.646	0.321	0.220	0.787	1.75	0.08	0.88	3/8-24UNF
	13250HR-4	4	2 1/2	2.362	3/4	0.433	0.669	0.321	0.220	0.787	1.75	0.08	1.54	3/8-24UNF
	13300HR-5	5	3	2.992	1	0.709	1.024	0.384	0.248	0.866	2.00	0.08	3.52	1/2-20UNF
	15250HR-3	3	2 1/2	2.362	3/4	0.433	0.669	0.321	0.220	0.787	1.75	0.10	1.54	3/8-24UNF
	15300HR-4	4	3	2.992	1	0.709	1.024	0.384	0.248	0.866	2.00	0.10	3.74	1/2-20UNF
	15400HR-5	5	4	3.780	1 1/4	0.709	1.024	0.510	0.319	0.866	2.00	0.10	6.16	1/2-20UNF
	15400HR-6	6	4	3.780	1 1/4	0.709	1.024	0.510	0.319	0.866	2.00	0.10	7.04	1/2-20UNF
	15500HR-6	6	5	3.858	1 1/2	0.866	1.260	0.636	0.394	1.181	2.50	0.10	7.26	3/4-16UNF
	15600HR-7	7	6	3.937	2	-	2.835	0.758	0.433	1.181	2.50	0.10	9.46	1-14UNF

Available Inserts

WDKT-MH

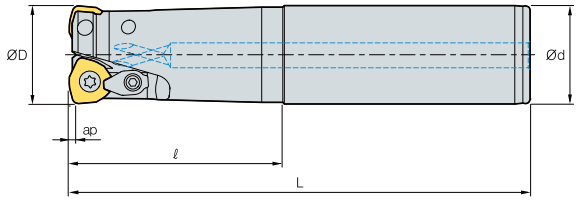
Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
13 type	WDKT	130520ZDSR-MH					●	●	●	●	●	●	●				E22
15 type	WDKT	150625ZDSR-MH					●	●		●	●	●	●				

Parts

Specification	Screw	Clamp	Clamp Screw	C-Ring	Wrench
Ø2~Ø3 (13type)	FTGA0513-P	CHH4.5R1	CTX04513H	CR03	TW20-100
Ø2 1/2~6 (15type)	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20-100

Available Inserts E22

HRMSA08 / 10



AA 75°

- AR : 7°
- RR : -11°~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	**08075HR-2S075**	2	3/4	3/4	1.969	5.118	0.04	0.66
	08075HR-2M075	2	3/4	3/4	3.937	7.087	0.04	0.88
	08075HR-2L075	2	3/4	3/4	5.118	9.843	0.04	1.10
	08087HR-2S075	2	7/8	3/4	1.969	5.118	0.04	0.66
	08087HR-2M075	2	7/8	3/4	1.969	7.087	0.04	0.88
	08087HR-2L075	2	7/8	3/4	1.969	9.843	0.04	1.10
	10100HR-2S100	2	1	1	2.362	5.512	0.06	0.88
	10100HR-2M100	2	1	1	4.724	7.874	0.06	0.32
	10100HR-2L100	2	1	1	7.087	11.811	0.06	0.98
	10106HR-2S100	2	1 1/16	1	2.362	5.512	0.06	0.88
	10106HR-2M100	2	1 1/16	1	2.362	7.874	0.06	1.32
	10106HR-2L100	2	1 1/16	1	2.362	11.811	0.06	2.20
	10118HR-2S125	2	1 3/16	1 1/4	2.756	5.906	0.06	1.76
	10118HR-2M125	2	1 3/16	1 1/4	4.724	7.874	0.06	2.20
	10118HR-2L125	2	1 3/16	1 1/4	7.087	11.811	0.06	3.30

Available Inserts

WDKT-MH

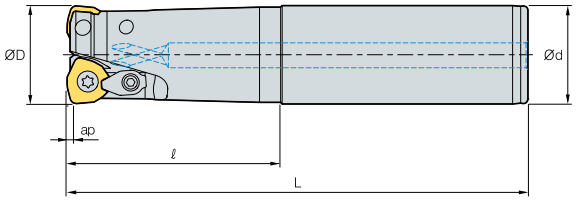
Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
08 type	WDKT	**080316ZDSR-MH**					●	●	●	●	●	●	●				E22
10 type	WDKT	**10T320ZDSR-MH**					●	●		●	●	●	●				

Parts

Specification	Screw	Clamp	Clamp Screw	C-Ring	Wrench
Ø3/4~Ø7/8 (08type)	FTNA0306	-	-	-	TW09P
Ø1~Ø1 3/16 (10type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S

Available Inserts **E22**

HRMSA13



AA 75°

- AR : 7°
- RR : -11° ~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	13125HR-2S125	2	1 1/4	1 1/4	2.756	5.906	0.08	1.76
	13125HR-2M125	2	1 1/4	1 1/4	4.724	7.874	0.08	2.20
	13125HR-2L125	2	1 1/4	1 1/4	7.087	11.811	0.08	3.52
	13131HR-2S125	2	1 5/16	1 1/4	2.756	5.906	0.08	1.76
	13131HR-2M125	2	1 5/16	1 1/4	2.756	7.874	0.08	2.42
	13131HR-2L125	2	1 5/16	1 1/4	2.756	11.811	0.08	3.74
	13137HR-2S125	2	1 3/8	1 1/4	1.969	5.906	0.08	1.76
	13137HR-2M125	2	1 3/8	1 1/4	1.969	7.874	0.08	2.42
	13137HR-2L125	2	1 3/8	1 1/4	1.969	11.811	0.08	3.74
	13150HR-3S125	3	1 1/2	1 1/4	1.969	5.906	0.08	1.76
	13150HR-3M125	3	1 1/2	1 1/4	1.969	9.843	0.08	3.08
	13150HR-3L125	3	1 1/2	1 1/4	1.969	11.811	0.08	3.74
	13150HR-3S150	3	1 1/2	1 1/2	2.362	5.906	0.08	2.64
	13150HR-3M150	3	1 1/2	1 1/2	5.118	9.843	0.08	4.62
	13150HR-3L150	3	1 1/2	1 1/2	7.087	11.811	0.08	5.72

Available Inserts

WDKT-MH

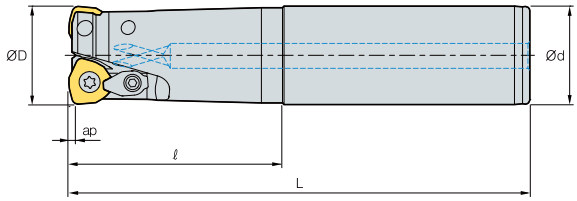
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	130520ZDSR-MH					●	●	●	●	●	●	●				E22

Parts

Specification	Screw	Clamp	Clamp Screw	C-Ring	Wrench
Ø1 1/4, 1 5/16, 1 3/8	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	TW20
Ø1 1/2	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	TW20

Available Inserts E22

HRMSA15



AA 75°

- AR : 7°
- RR : -8° ~ -6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	**15200HR-3S125**	3	2	1 1/4	1.969	5.906	0.10	2.20
	15200HR-3M125	3	2	1 1/4	1.969	9.843	0.10	3.52
	15200HR-3L125	3	2	1 1/4	1.969	11.811	0.10	4.18
	15200HR-3S150	3	2	1 1/2	1.969	5.906	0.10	3.08
	15200HR-3M150	3	2	1 1/2	1.969	9.843	0.10	5.06
	15200HR-3L150	3	2	1 1/2	1.969	11.811	0.10	6.16
	15250HR-4S125	4	2 1/2	1 1/4	1.969	5.906	0.10	2.86
	15250HR-4M125	4	2 1/2	1 1/4	1.969	9.843	0.10	4.18
	15250HR-4L125	4	2 1/2	1 1/4	1.969	11.811	0.10	4.84
	15250HR-4S150	4	2 1/2	1 1/2	1.969	5.906	0.10	3.74
	15250HR-4M150	4	2 1/2	1 1/2	1.969	9.843	0.10	5.72
	15250HR-4L150	4	2 1/2	1 1/2	1.969	11.811	0.10	6.82

Available Inserts

WDKT-MH

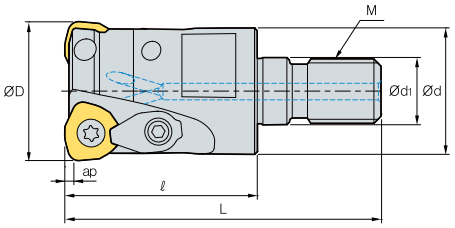
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	**150625ZDSR-MH**					●	●		●	●	●	●				E22

Parts

Specification	Screw	Clamp	Clamp Screw	C-Ring	Wrench
Ø2~Ø2 1/2	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20

Available Inserts **E22**

HRMMA08 / 10 / 13



AA 75°

- AR : 7°
- RR : -11° ~ -5°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
HRMMA	08075HR-M10	2	3/4	0.689	0.413	1.181	2.008	M10	0.04	0.11
	08081HR-M10	2	13/16	0.689	0.413	1.181	2.008	M10	0.04	0.11
	08100HR-M12	3	1	0.906	0.492	1.378	2.323	M12	0.04	0.22
	08106HR-M12	3	1 1/16	0.906	0.492	1.378	2.323	M12	0.04	0.26
	08112HR-M12	3	1 1/8	0.906	0.492	1.378	2.323	M12	0.04	0.46
	08125HR-M16	4	1 1/4	1.142	0.669	1.575	2.638	M16	0.04	0.48
	08131HR-M16	4	1 5/16	1.142	0.669	1.575	2.638	M16	0.04	0.48
	08137HR-M16	4	1 3/8	1.142	0.669	1.575	2.638	M16	0.04	0.51
	08150HR-M16	5	1 1/2	1.142	0.669	1.575	2.638	M16	0.04	0.55
	10100HR-M12	2	1	0.906	0.492	1.378	2.323	M12	0.06	0.20
	10106HR-M12	2	1 1/16	0.906	0.492	1.378	2.323	M12	0.06	0.20
	10118HR-M16	2	1 3/16	1.142	0.669	1.575	2.638	M16	0.06	0.37
	10125HR-M16	3	1 1/4	1.142	0.669	1.772	2.835	M16	0.06	0.46
	10137HR-M16	3	1 3/8	1.142	0.669	1.772	2.835	M16	0.06	0.51
	10150HR-M16	4	1 1/2	1.142	0.669	1.772	2.835	M16	0.06	0.59
	13125HR-M16	2	1 1/4	1.142	0.669	1.575	2.638	M16	0.08	0.37
	13131HR-M16	2	1 5/16	1.142	0.669	1.575	2.638	M16	0.08	0.37
	13137HR-M16	2	1 3/8	1.142	0.669	1.575	2.638	M16	0.08	0.42
	13150HR-M16	3	1 1/2	1.142	0.669	1.772	2.835	M16	0.08	0.53

Available Inserts

WDKT-MH

Type	Designation		Cermet		Coated							Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
08 type	WDKT	080316ZDSR-MH					●	●	●	●	●	●	●				E23
10 type	WDKT	10T320ZDSR-MH					●	●		●	●	●	●				
13 type	WDKT	130520ZDSR-MH					●	●	●	●	●	●	●				

Available Adaptor

Designation		Available Adaptor	Designation		Available Adaptor	Designation		Available Adaptor
HRMMA	08075HR-M10	MATA-M10	HRMMA	08137HR-M16	MATA-M16	HRMMA	10150HR-M16	MATA-M16
	08081HR-M10			08150HR-M16			13125HR-M16	MATA-M16
	08100HR-M12	MATA-M12		10100HR-M12	MATA-M12		13131HR-M16	
	08106HR-M12			10106HR-M12			13137HR-M16	
	08112HR-M12			10118HR-M16	MATA-M16		13150HR-M16	
	08125HR-M16	MATA-M16		10125HR-M16				
	08131HR-M16			10137HR-M16				

Designation : HRMM0820HR-M10
Modular Head Threading Measure size(M10)

II

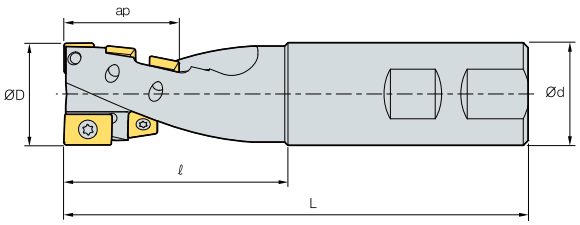
Adaptor Spec. : MAT-M10-030-S20S
Adaptor Threading Measure(M10)

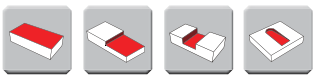
Parts

Specification	Screw	Clamp	Clamp Screw	C-Ring	Wrench	Wrench
Ø3/4~Ø1 1/2 (08type)	FTNA0306	-	-	-	-	-
Ø1~Ø1 1/2 (10type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S	-
Ø1 1/4, 1 5/16, 1 3/8 (13type)	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	-	TW20
Ø1 1/2 (13type)	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	-	TW20

Available Inserts E23 Available Adaptors E252~E253

THEA





- AR : 5°, 10°
- RR : -5°

(inch)

Designation		ØD	Ød	ℓ	L	ap	No. of flute	lbs	Available Inserts			
									Lower cutting edge		External cutting edge	
THEA	**098R**	0.984	3/4	2.165	4.724	0.984	2	0.88	APLT070304R	1	SPMT221	4
	125R	1.259	1	2.756	5.709	1.575	2	1.10	ADLT150308R	1	SDMT322-MM	5
	157R	1.574	1 1/4	3.465	6.89	2.126	2	2.86	ZPMT1504PPSR-MM	1	SPMT432-MM	5
	196R	1.968	1 1/2	3.346	6.89	2.126	4	3.08	ZPMT1504PPSR-MM 2z	2	SPMT432-MM	10

Available Inserts


ADLT


APLT


SPMT-MM


SPMT


SDMT-MM


ZPMT-MM

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	**221**			●												E04 E05 E14 E21 E24
SDMT	**322-MM**					●					●					
SPMT	**432-MM**					●					●					
APLT	**070304R**										●					
ADLT	**150308R**			●							●					
ZPMT	**1504PPSR-MM**					●		●			●					

Recommended cutting condition

• Grooving

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	290~460	0.002~0.010	PC5300
M	165~295	0.002~0.010	PC5300
K	230~390	0.002~0.010	PC5300

• Side cutting

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	490~790	0.002~0.008	PC5300
M	295~490	0.002~0.008	PC5300
K	390~655	0.004~0.010	PC5300

Parts

Specification	 Screw	 Wrench	 Wrench
Ø0.984	ETNA02506	TW07P	-
Ø1.259	ETNA0408	-	TW15S
Ø1.574	ETNA0511	-	TW20S
Ø1.968	ETNA0511	-	TW20S

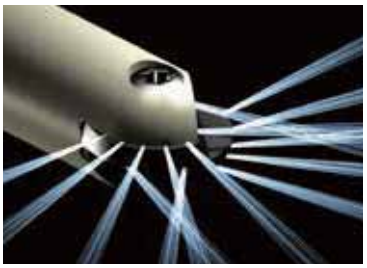
Available Inserts **E04, E05, E14, E21, E24**

Longer tool life is achieved due to the excellent cutting performance of the insert grade

Laser Mill

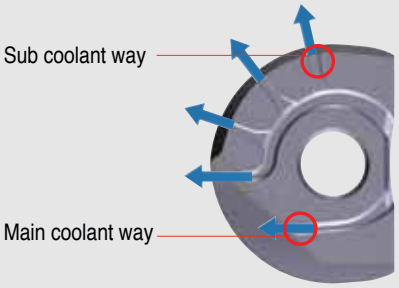
- Long tool life has been achieved due to the excellent cutting performance of the insert grade
- Optimum machining of molds has been achieved with the MQL available system
- Easy clamping with simple screw on system
- Various holder line up: steel shank, carbide shank, modular type
- High accuracy indexable endmills for mold finishing

MQL System

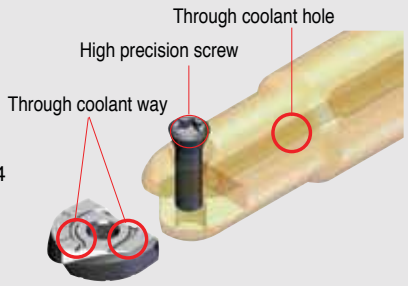


- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting edge
- Improved chip control property
- Increased tool life & improved surface quality

Clamping system



- **High precision (ground internal diameter)**
  Run-out : 0.0008inch
  Accuracy of 'R part : below 0.0004
- **Through coolant system**



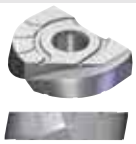
Features

LBE

- Six types of inserts are available with one holder
- Single screw for clamping of insert : Easy clamping system
- Various types of holders
  (Steel shank, Carbide shank, Modular type)
- MQL applicable - environmentally responsible with longer tool life & improved surface quality.

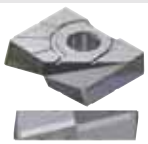
LBS, LR Order-made items

LBH-Ball



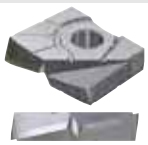
- Helical cutting edge
- Suitable for harder material with high feed

LRH-Corner radius



- Helical cutting edge
- Variety of nose -R

LFH-High feed



- Helical cutting edge
- Suitable for high feed

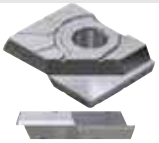
LCF-Chamfer

- Straight cutting edge
- Center drilling and chamfering

LBS-Ball type

- Straight cutting edge
- Suitable for precise

LR-Corner R type

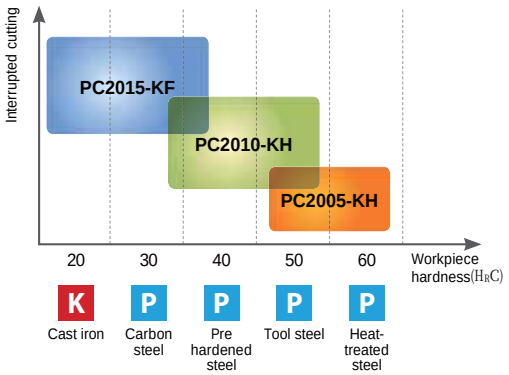


- Straight cutting edge
- Variety of nose-R

Features of Laser Mill Grades

PC2005	• Extremely high hardness grade • The harmony between improved blade design and strong chip breaker • Optimized for machining heat-treated steel and high hardness steel
PC2010	• High wear resistance and excellent toughness • The harmony between excellent thermal shock resistance and strong cutting edges. • Optimized for machining tool steel and pre hardened steel
PC2015	• High welding resistance and excellent toughness • The harmony between tough grade and excellent cutting edge design • Optimized for machining carbon steel

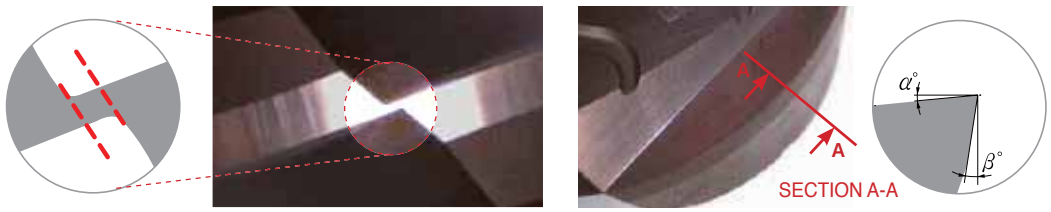
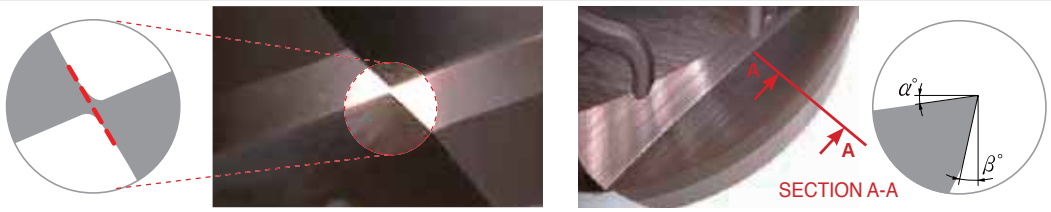
Application Guideline per Workpiece



Features of KF / KH Chip Breaker

▶ KF : Exclusive chip breaker for stable machining of carbon steel with its characteristics of high wear resistance at center part and improved blade design.

▶ KH : Stronger insert with the combination of rake angle and relief angle that are ideal for machining high hardness workpiece.

Type	Shape comparison
Standard (For general cutting)	 • Proper to general cutting • Insert shape for uniform performance
KH (For high hardness steel)	 • Center shaper proper for machining high hardness workpiece and uniformed tool life at center part • Improved cutting edge design by higher rake angle(α°) • Lower relief angle(ß°) increases strength of cutting edges than universal inserts.
KF (For carbon steel)	 • Smaller chisel improves wear resistance at center for machining carbon steel. • Improved cutting edge design by higher rake angle(α°) • Longer tool life and better cutting performance with the use of excellent blade design

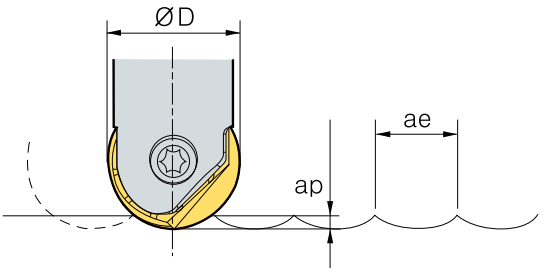
Recommended Cutting Conditions

Workpiece				Grade	Chip breaker	Recommended cutting conditions			
ISO		Material	HB(HRC)			vc(sfm)	fz(ipt)	ap(inch)	ae(inch)
K	Gray cast iron	GC250	180(8)	PC2015 PC2010 PC2005	KF	427~689	0.008~0.020	0.003D	0.003D
K	Ductile cast iron	GCD600	250(24)						
P	Carbon steel	S20C~S50C	150			558~820	0.008~0.020	0.003D	0.003D
P	Alloy steel	SCM21~SCM5H	270(28)	PC2010 PC2015 PC210F	KH	427~689	0.004~0.012	0.003D	0.003D
P	Pre hardened steel	KP4M	300(32)			328~525	0.004~0.012	0.020D	0.020D
P	Pre hardened steel	NIMAX	370(40)						
P	Pre hardened steel	CENA1	370(40)						
P	Pre hardened steel	NAK80	400(43)						
P	Pre hardened steel	STAVAX	510(52)						
P	High speed tool steel	SKH51~SKH59	550(55)	PC2005 PC2010	KH	262~427	0.004~0.080	0.012D	0.012D
P	Alloy tool steel	STD61(Hot forging)	630(60)			230~394	0.004~0.080	0.020D	0.020D
P	Alloy tool steel	STD11(Cold forging)							

Overhang	vc(sfm)	fz(ipt)
Under 3D	100%	100%
3D ~ 5D	70%	70%
5D ~ 8D	60%	60%
8D ~ 10D	50%	50%

Cutting condition formula for milling

Practical Cutting speed	RPM
$vc = \frac{\pi \times De \times n}{12}$ (sfm)	$n = \frac{vce \times 12}{\pi \times De}$ (min^{-1})
Feed per tooth	**Feed per minute**
$fz = \frac{vf}{n \times z}$ (ipt)	$vf = fz \times n \times z$ (ipm)
Chip removal amount	**Power requirement**
$Q = ap \times ae \times vf$ ($inch^3$/min)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $H = \frac{Pc}{0.75}$ (kw)



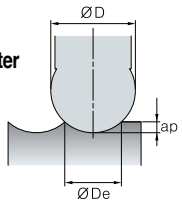
vc	= Cutting speed(m/min)	Pkw	= Power Requirement (kW)
vc_e	= Practical cutting speed(m/min)	Php	= Horsepower requirement(hp)
n	= Revolution per Minute(min^{-1})	Q	= Chip removal amount(cm^3/min)
D	= Cutting diameter(mm)	ap	= Depth of cut(mm)
De	= Actual diameter(mm)	ae	= Width of cut(mm)
vf	= Feed per minute(mm/min)	kc	= Specific cutting resistance(kg/mm^2)
fz	= Feed per tooth(mm/t)	η	= Mechanical efficiency(%)
z	= Number of tooth		

Practical cutting speed calculation formulas

1. Formula of actual diameter

• **Formula : Actual diameter**

$De = 2\sqrt{ap(D-ap)}$



2. θ°Using : Calculating cutting speed at P point (Cutting speed according to depth of cut when ramping)

• **Formula : Practical cutting speed**

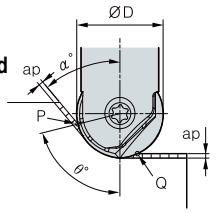
$vce = \frac{\pi \times De \sin\theta \times n}{12}$ (sfm)

$\theta = \cos^{-1}\left(\frac{De - 2ap}{De}\right) + 90 - \alpha°$

3.In case of using ap : Calculating cutting speed at Q point

• **Formula : Pratical cutting speed**

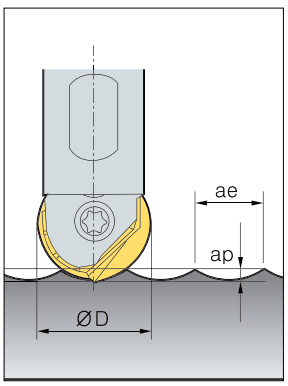
$vce = \frac{2\pi n\sqrt{ap(De - ap)}}{12}$



Practical cutting speed calculation formulas

R(inch) \ ae(inch)	h(surface roughness) (μm)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	0.3	1.0	2.3	4.0	6.3	9.0	12.3	16.0	20.3	25.0
6	0.2	0.8	1.9	3.3	5.2	7.5	10.2	13.3	16.9	20.8
8	0.2	0.6	1.4	2.5	3.9	5.6	7.7	10.0	12.7	15.6
10	0.1	0.5	1.1	2.0	3.1	4.5	6.1	8.0	10.1	12.5
12.5	0.1	0.4	0.9	1.6	2.5	3.6	4.9	6.4	8.1	10.0
15	0.1	0.3	0.8	1.3	2.1	3.0	4.1	5.3	6.8	8.3
16	0.1	0.3	0.7	1.3	2.0	2.8	3.8	5.0	6.3	7.8

• Formula of surface roughness : h(surface finish) = $\frac{(ae)^2}{8R} \times 1000(\mu m)$



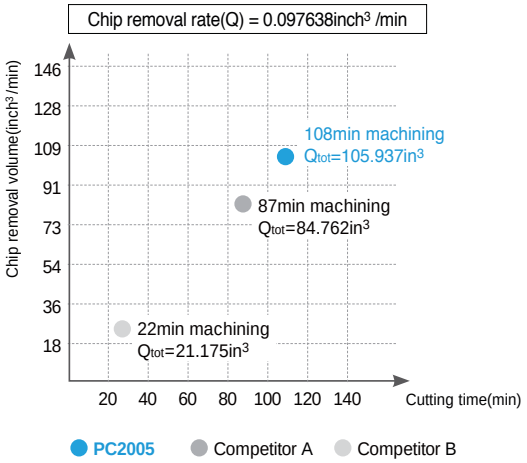
Actual diameter data

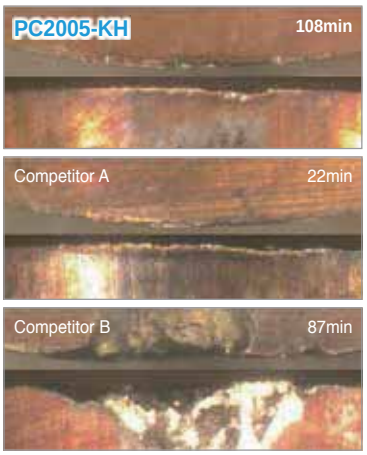
ap \ ØD	Ø0.31	Ø0.38	Ø0.50	Ø0.63	Ø0.75	Ø1.00	Ø1.25
0.0039	0.0709	0.0787	0.0866	0.0984	0.1102	0.1260	0.1401
0.0079	0.0984	0.1102	0.1220	0.1417	0.1575	0.1772	0.1978
0.0118	0.1181	0.1339	0.1457	0.1693	0.1929	0.2126	0.2419
0.0197	0.1535	0.1732	0.1890	0.2205	0.2441	0.2756	0.2794
0.0394	0.2087	0.2362	0.2598	0.3031	0.3425	0.3858	0.4367
0.0591	0.2441	0.2795	0.3110	0.7598	0.4134	0.4685	0.5304
0.0787	0.2717	0.3150	0.3504	0.4173	0.4724	0.5354	0.6074
0.0984	0.2913	0.3425	0.3819	0.4567	0.5197	0.5906	0.6733
0.1181	0.3031	0.3622	0.4094	0.4921	0.5630	0.6378	0.7313
0.1378	0.3110	0.3740	04291	0.5197	0.5984	0.6811	0.7803
0.1575	0.3150	0.3858	0.4449	0.5472	0.6299	0.7205	0.8296
0.1969			0.4646	0.5827	0.6811	0.7874	0.9106
0.2362			0.4724	0.6102	0.7205	0.8425	0.9787
0.2756				0.6260	0.7520	0.8819	1.0364
0.3150				0.6299	0.7717	0.9173	1.0854
0.3937					0.7874	0.9646	1.1613

Performance Test

PC2005 tool life test — High hardness heat-treated steel (X100CrMoV5 1, heat-treated HRC60)

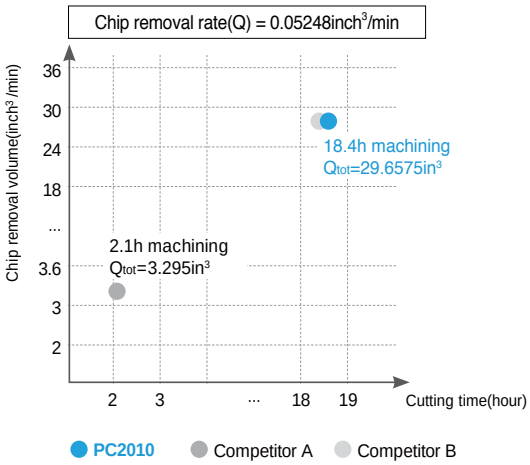
- Cutting conditions
  vc = 459sfm
  fz = 0.006ipt
  ap = 0.047inch
  ae = 0.047inch
  Dry
- Tools
  Insert LBH0500-KH (PC2005)

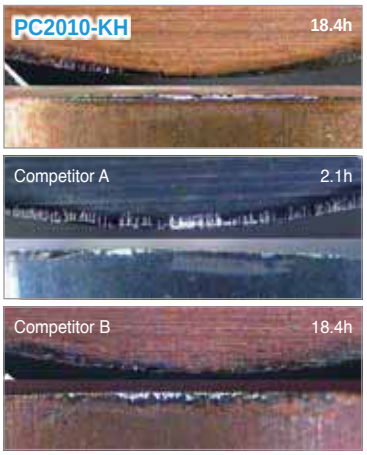




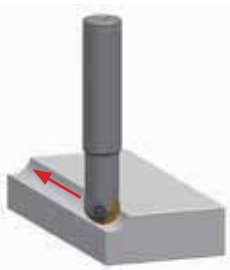
PC2010 tool life test — Pre hardened steel (X40CrMnNiMo8-6-4)

- Cutting conditions
  vc = 906sfm
  fz = 0.006ipt
  ap = 0.012inch
  ae = 0.047inch
  Dry
- Tools
  Insert LBH0500-KH (PC2010)

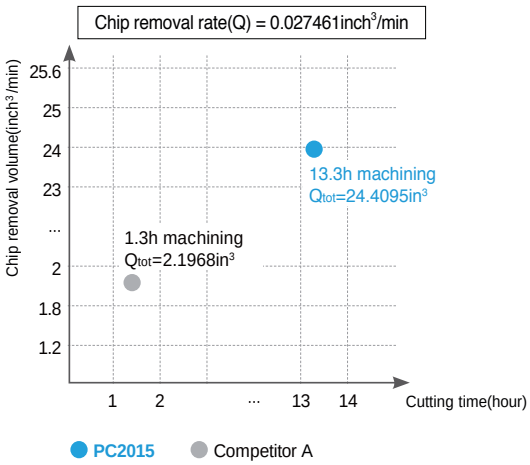


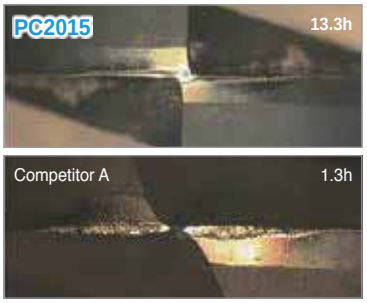


PC2015 tool life test — Carbon steel (C45)

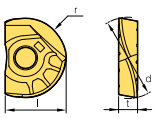
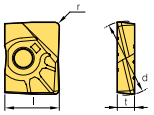
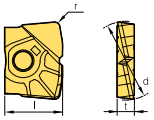
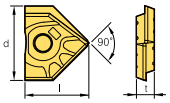
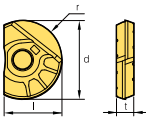
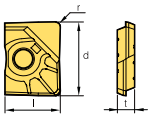


- Cutting conditions
  vc = 820sfm
  fz = 0.014ipt
  ap = 0.012inch
  ae = 0.012inch
  Dry
- Tools
  Insert LBH0500 (PC2015)





Available Inserts

Holders			LFH (High feed type)	LCF (Chamfer type)	LBS(Ball type)	
					 R accuracy ±0.005	
LBEA031	LBH0312 LBH0312-KF LBH0312-KH				LBS0312	
LBEA037	LBH0375 LBH0375-KF LBH0375-KF	LRH0375-R015 LRH0375-R031 LRH0375-R062	LFH0375		LBS0375	LR0375-R015 LR0375-R031 LR0375-R062
LBEA050	LBH0500 LBH0500-KF LBH0500-KH	LRH0500-R015 LRH0500-R031 LRH0500-R062	LFH0500		LBS0500	LR0500-R015 LR0500-R031 LR0500-R062
LBEA062	LBH0625 LBH0625-KF LBH0625-KH	LRH0625-R015 LRH0625-R062 LRH0625-R031 LRH0625-R125	LFH0625	LCF0625-D90	LBS0625	LR0625-R015 LR0625-R062 LR0625-R031 LR0625-R125
LBEA075	LBH0750 LBH0750-KF LBH0750-KH	LRH0750-R015 LRH0750-R062 LRH0750-R031 LRH0750-R125	LFH0750	LCF0750-D90	LBS0750	LR0750-R015 LR0750-R062 LR0750-R031 LR0750-R125
LBEA100	LBH1000 LBH1000-KF LBH1000-KH	LRH1000-R015 LRH1000-R062 LRH1000-R031 LRH1000-R125	LFH1000	LCF1000-D90	LBS1000	LR1000-R015 LR1000-R062 LR1000-R031 LR1000-R125
LBEA125	LBH1250 LBH1250-KF LBH1250-KH	LRH1250-R015 LRH1250-R031 LRH1250-R062	LFH1250		LBS1250	LR1250-R015 LR1250-R031 LR1250-R062

Available Inserts E07, E08

Long tool life due to high hardness grade

GBE

- Indexable Ballnose Endmill for Molds in medium & roughing applications
- Long tool life with high hardness grade
- Helical high accuracy cutting edge
- Optimized mold machining process with our internal coolant system
- Able to adjust to medium processing in middle & big roughing mold process
- Various holders in normal & long style holders

Holder Code System

GBEA	063	–	S	125
Product Name	**Machining Dia.**		**Type**	**Shank Dia.**
General Indexable Ball Endmill	Ø0.630, Ø0.790, Ø0.980, Ø1.180 Ø1.260, Ø1.530, Ø1.970		S : Standard shank L : Long shank	125 : Ø1.25

Internal	External
 Flank support	 Concave bottom

- ▶ Ability to handle high accuracy & large depth of cut applications.
  - Run-out : within 0.002inch
  - R accuracy : within 0.002inch
- ▶ Various diameters (Ø0.630, Ø0.790, Ø0.980, Ø1.180, Ø1.260, Ø1.530, Ø1.970)
- ▶ Minimal cutting resistance due to Helical cutting edge
- ▶ Anti-rotation of insert due to concave bottom & stable setting by flank support
- ▶ Long tool life & better processing due to 2 cutting inserts
- ▶ Better tool life with new grade


Multi Edge type


Single Edge type


Modular type

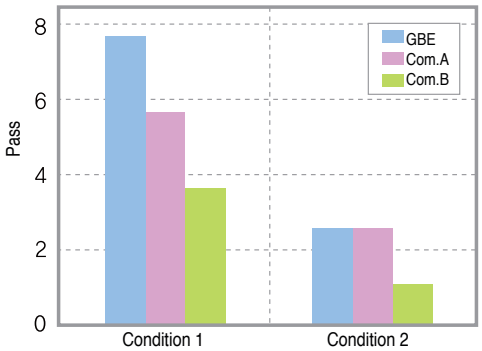

Projection

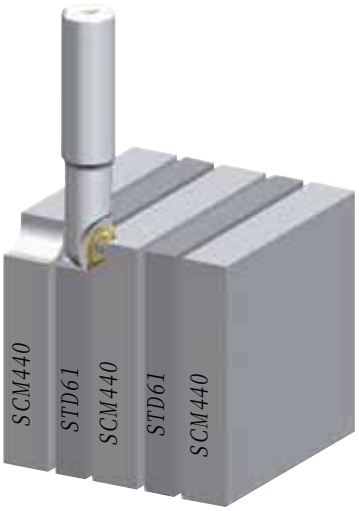
- ▶ Various diameters (Ø0.630, Ø0.790, Ø0.980, Ø1.180, Ø1.260, Ø1.530, Ø1.970)
- ▶ Improved chip treatment with internal coolant(cutting edge portion)
- ▶ Long tool life & better processing
- ▶ Easy insert setting with projection part to prevent vibration during processing

How to set insert

1. Set the insert to the holder projection seat
2. Push the insert into the pocket as shown by red arrows and screw down with wrench

Cutting Performance Test

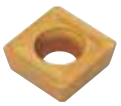




Cutting condition

Class.	Cutting speed(vc)	Feed(fz)	Depth of cut(ap)	Depth of cut(ae)	Workpiece	Etc.
Condition 1	492sfm	0.006ipt	0.197inch	0.315inch	H13(HRC50) + 4140(HRC20)	Dry
Condition 2	492sfm	0.004ipt	0.315inch	0.315inch		

Inserts / Parts

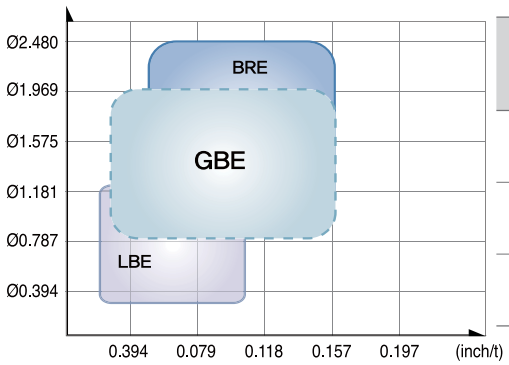
Type	Insert			Parts			
							

Dia.	Internal I/S	External I/S	External main I/S	Screw		Wrench	
				Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type
Ø0.630	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-
Ø0.709	ZPET090M-MM	ZPET090S-MM	-	FTKA0307	-	TW09S	-
Ø0.787	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P
Ø0.866	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P
Ø0.984	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P
Ø1.024	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S
Ø1.102	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S
Ø1.181	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø1.260	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø1.575	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20-100	TW20S
Ø1.969	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25S	TW20S

Recommended cutting condition

Workpiece	Machining type	Hardness (HRC)	vc(sfm)	fz(ipt)	ap(inch)	ae(inch)
Carbon, Alloy steel	Flank Groove Deep flank	Under 25	520~820 300~650 520~820	0.020~0.012 0.020~0.012 0.020~0.039	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Carbon, Alloy steel	Flank Groove Deep flank	Under 45	300~650 300~520 300~650	0.020~0.012 0.020~0.012 0.020~0.039	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Mold Alloy steel	Flank Groove Deep flank	30~40	300~650 300~520 300~650	0.012~0.012 0.012~0.012 0.012~0.039	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Cast iron(GC, GCD)	Flank Groove Deep flank	20~30	150~300 150~300 150~300	0.028~0.012 0.028~0.012 0.028~0.039	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Heat treatment steel	Flank Groove Deep flank	50~60	130~320 130~320 130~320	0.012~0.012 0.012~0.012 0.012~0.039	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D

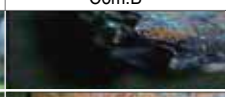
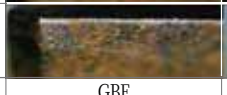
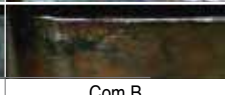
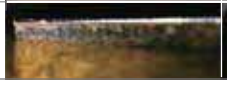
Line-up for Indexable ball Endmill



Type	Application				
	Machining Dignity	Machining Efficiency	Machining Dia. Equivalence	Economical	Flank Machining with LongEdge
Laser Mill	●	○	◐	○	○
GBE	◐	●	◐	◐	●
BRE	○	●	●	●	●

● : Very Good ◐ : Good ○ : Normal

Test Result for wear resistance

Cutting conditioin		Wear resistance photos			
				GBE	Com.A	Com.B
	• Workpiece KP4M(HRC33), Dry • Condition vc = 920sfm fz = 0.01ipt ap = 0.2~0.4inch ae = 0.2~0.4inch vf = 58.5sfm n = 2,971rpm • Tool Holder : GBE300-S32 Insert : ZPET150M-MM(PC3500) ZPET150S-MM(PC3500)	Top	Internal			
			External			
		Flank	Internal			
Cutting time : 4 Pass			External			
				GBE	Com.A	Com.B
	• Workpiece STD11(HRC20), Dry • Condition vc = 820sfm fz = 0.008ipt ap = 0.2inch ae = 0.2inch vf = 42.45sfm n = 2,653rpm • Tool Holder : GBE300-S32 Insert : ZPET150M-MM(PC3500) ZPET150S-MM(PC3500)	Top	Internal			
			External			
		Flank	Internal			
Cutting time : 4 Pass			External			

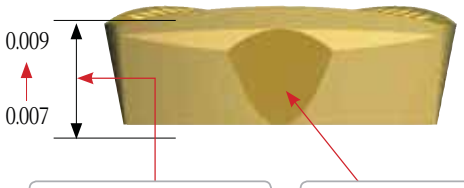
Better tool life and anti-breakage with special surface treatment on the holder

BRE

- Cutting Performance : Good chip control & Superior cutting performance with optimal cutting edge line
- High rigidity body : Better tool life and special surface treatment to strengthen the holder
  Easy to set and good durability with TCRX screw
  Good chip control with our 3D flute design & improved external quality
- Insert : Able to apply in high speed & feed applications due to special grade which has wear & breakage resistance and stable cutting performance with high cutting edge toughness & high rake angle chip breaker

Multi edge holder ISO View

• Good chip flow
• Good heat emission

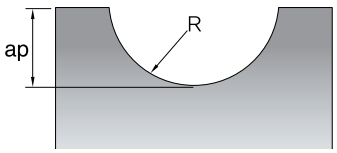


• Wider insert ensures cutting edge strength

• Better setting force by recess

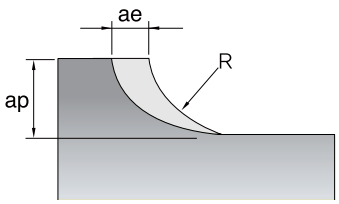
BRE machining type for roughing & Recommended cutting condition

Machining Type 1



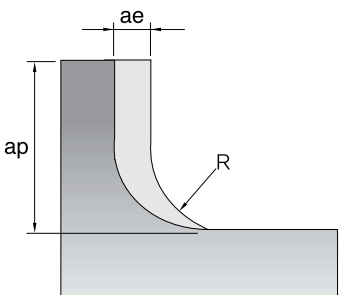
ap=0.3D~0.5D

Machining Type 2



ae=0.2D~0.3D ap=0.3D~0.5D

Machining Type 3



ae=0.1D~0.5D ap=1.2D~1.5D

Workpiece	Machining Type	Velocity(sfm)	Feed(ipt)	Grade
Carbon / Alloy steel	1 2 3	390~720 390~720 330~590	0.004~0.016 0.008~0.016 0.004~0.012	NCM325 NCM325 NCM325
Alloy steel	1 2 3	330~655 330~655 260~525	0.004~0.016 0.008~0.016 0.004~0.012	NCM325 NCM325 NCM325
Tool steel	1 2 3	260~490 260~490 195~395	0.004~0.012 0.006~0.014 0.004~0.012	NCM325 NCM325 NCM325
High hardness material (H_R35-45)	1 2 3	195~395 195~395 165~260	0.004~0.012 0.004~0.012 0.004~0.008	NCM325 NCM325 NCM325
Cast iron	1 2 3	330~590 330~590 260~525	0.008~0.020 0.008~0.020 0.006~0.016	NCM320K NCM320K NCM320K

Steel Shank(Ball, Corner R type)

Straight type

LBEA031-C/037-C/050-C/062-C/075-C/100-C/125-C

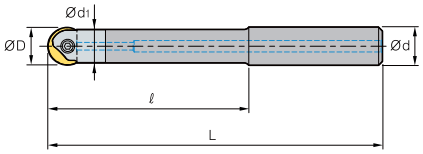


Fig. 1

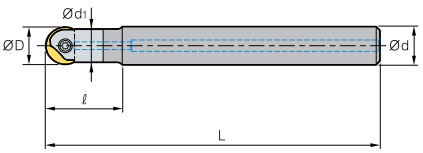


Fig. 2

(inch)

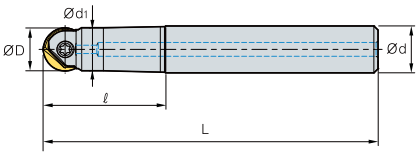
Designation		Dimensions					Parts		Available Inserts(Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench		
LBEA	031315S-S031C	5/16	5/16	0.283	3.150	5.354	ETND02506F	TWP07S	5/16	1
	031394S-S031C	5/16	5/16	0.283	3.937	6.142				1
	031079S-S031C-512	5/16	5/16	0.283	0.787	5.118	ETND02506F	TWP07S	5/16	2
	031079S-S031C-591	5/16	5/16	0.283	0.787	5.906				2
	037315S-S037C	3/8	3/8	0.335	3.150	5.354	ETND0307F	TWP08S	3/8	1
	037472S-S037C	3/8	3/8	0.335	4.724	6.929				1
	037091S-S037C-512	3/8	3/8	0.335	0.906	5.118	ETND0307F	TWP08S	3/8	2
	037091S-S037C-669	3/8	3/8	0.335	0.906	6.693				2
	050394S-S050C	1/2	1/2	0.433	3.937	6.142	ETND03509	TWP10S	1/2	1
	050591S-S050C	1/2	1/2	0.433	5.906	8.110				1
	050098S-S050C-591	1/2	1/2	0.433	0.984	5.906	ETND03509	TWP10S	1/2	2
	050098S-S050C-787	1/2	1/2	0.433	0.984	7.874				2
	062394S-S062C	5/8	5/8	0.571	3.937	6.299	ETND0413	TWP15S	5/8	1
	062591S-S063C	5/8	5/8	0.571	5.906	8.268				1
	062118S-S062C-630	5/8	5/8	0.571	1.181	6.299	ETND0413	TWP15S	5/8	2
	062118S-S062C-827	5/8	5/8	0.571	1.181	8.268				2
	075472S-S075C	3/4	3/4	0.689	4.724	7.480	ETKD0516	TWP20	3/4	1
	075669S-S075C	3/4	3/4	0.689	6.693	9.449				1
	075138S-S075C-748	3/4	3/4	0.689	1.378	7.480	ETKD0516	TWP20	3/4	2
	075138S-S075C-945	3/4	3/4	0.689	1.378	9.449				2
	100551S-S100C	1	1	0.906	5.512	8.661	ETKD0620	TWP25	1	1
	100669S-S100C	1	1	0.906	6.693	9.843				1
	150157S-S100C-866	1	1	0.906	1.575	8.661	ETKD0620	TWP25	1	2
	150157S-S100C-984	1	1	0.906	1.575	9.843				2
	125551S-S125C	1 1/4	1 1/4	1.142	5.512	9.055	ETGD0825	TWP40	1 1/4	1
	125669S-S125C	1 1/4	1 1/4	1.142	6.693	10.236				1
	125197S-S125C-906	1 1/4	1 1/4	1.142	1.969	9.055	ETGD0825	TWP40	1 1/4	2
	125197S-S125C1024	1 1/4	1 1/4	1.142	1.969	10.236				2

Available Inserts **E07, E08**

Steel Shank(Ball, Corner R type)

Taper type

LBEA031/037/050/062/075/100/125



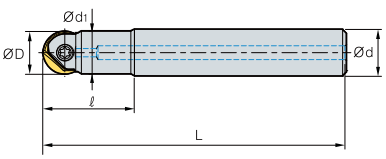
(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench	
LBEA	031138T-S050	5/16	1/2	0.283	1.378	3.583	ETND02506F	TWP07S	5/16
	031217T-S050	5/16	1/2	0.283	2.165	4.370			
	031295T-S050	5/16	1/2	0.283	2.953	5.157			
	037138T-S050	3/8	1/2	0.335	1.378	3.583	ETND0307F	TWP08S	3/8
	037217T-S050	3/8	1/2	0.335	2.165	4.370			
	037295T-S050	3/8	1/2	0.335	2.953	5.157			
	050217T-S050	1/2	1/2	0.433	2.165	4.370	ETND03509	TWP10S	1/2
	050335T-S050	1/2	5/8	0.433	3.346	5.709			
	062256T-S062	5/8	5/8	0.571	2.559	4.921	ETND0413	TWP15S	5/8
	062394T-S075	5/8	3/4	0.571	3.937	6.693			
	075295T-S100	3/4	1	0.689	2.953	5.709	ETKD0516	TWP20	3/4
	075453T-S100	3/4	1	0.689	4.528	7.677			
	100354T-S100	1	1	0.906	3.543	6.693	ETKD0620	TWP25	1
	100532T-S125	1	1 1/4	0.906	5.315	8.858			
	125413T-S125	1 1/4	1 1/4	1.142	4.134	7.677	ETGD0825	TWP40	1 1/4
	125630T-S125	1 1/4	1 1/4	1.142	6.299	9.843			

Steel Shank(Ball, Corner R type)

Straight type

LBEA050/062/075/100/125



(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench	
LBEA	050138S-S050	1/2	1/2	0.433	1.378	3.583	ETND03509	TWP10S	1/2
	062138S-S062	5/8	5/8	0.571	1.378	3.74	ETND0413	TWP15S	5/8
	075157S-S075	3/4	3/4	0.689	1.575	4.331	ETKD0516	TWP20	3/4
	100177S-S100	1	1	0.906	1.772	4.921	ETKD0620	TWP25	1
	125217S-S125	1 1/4	1 1/4	1.142	2.165	5.709	ETGD0825	TWP40	1 1/4

Available Inserts **E07, E08**

Carbide Shank(Ball, Corner R type)

Straight type

LREA-C/037-C/050-C/062-C/075-C/100-C/125-C

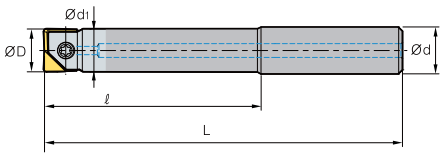


Fig. 1

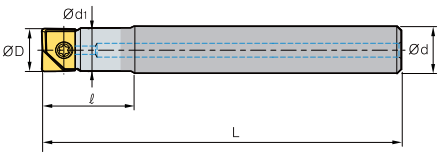


Fig. 2

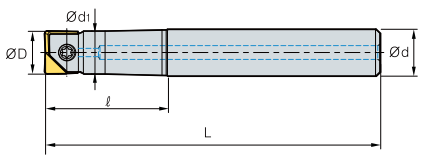
(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench		
LREA	037315S-S037C	3/8	3/8	0.335	3.150	5.354	ETND0307F	TWP08S	3/8	1
	037472S-S037C	3/8	3/8	0.335	4.724	6.929				1
	037091S-S037C-512	3/8	3/8	0.335	0.906	5.118	ETND0307F	TWP08S		2
	037091S-S037C-660	3/8	3/8	0.335	0.906	6.693				2
	050394S-S050C	1/2	1/2	0.433	3.937	6.142	ETND03509	TWP10S	1/2	1
	050591S-S050C	1/2	1/2	0.433	5.906	8.110				1
	050098S-S050C-591	1/2	1/2	0.433	0.984	5.906	ETND03509	TWP10S		2
	050098S-S050C-787	1/2	1/2	0.433	0.984	7.874				2
	062394S-S062C	5/8	5/8	0.571	3.937	6.299	ETND0413	TWP15S	5/8	1
	062591S-S062C	5/8	5/8	0.571	5.906	8.268				1
	062117S-S062C-630	5/8	5/8	0.571	1.181	6.299	ETND0413	TWP15S		2
	062117S-S062C-827	5/8	5/8	0.571	1.181	8.268				2
	075472S-S075C	3/4	3/4	0.689	4.724	7.480	ETKD0516	TWP20	3/4	1
	075669S-S075C	3/4	3/4	0.689	6.693	9.449				1
	075138S-S075C-748	3/4	3/4	0.689	1.378	7.480	ETKD0516	TWP20		2
	075138S-S075C-945	3/4	3/4	0.689	1.378	9.449				2
	100551S-S100C	1	1	0.906	5.512	8.661	ETKD0620	TWP25	1	1
	100669S-S100C	1	1	0.906	6.693	9.843				1
	100157S-S100C-866	1	1	0.906	1.575	8.661	ETKD0620	TWP25		2
	100157S-S100C-984	1	1	0.906	1.575	9.843				2
	125551S-S125C	1 1/4	1 1/4	1.142	5.512	9.055	ETGD0825	TWP40	1 1/4	1
	125669S-S125C	1 1/4	1 1/4	1.142	6.693	10.236				1
	125197S-S125C-906	1 1/4	1 1/4	1.142	1.969	9.055	ETGD0825	TWP40		2
	125197S-S125C1024	1 1/4	1 1/4	1.142	1.969	10.236				2

Steel Shank(Corner R type)

Taper type

LREA037/050



(inch)

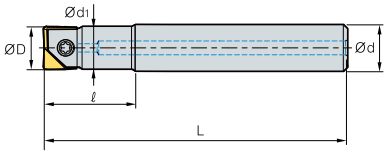
Designation		Dimensions					Parts		Available Inserts(Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench	
LREA	037098T-S050	3/8	1/2	0.335	0.984	4.370	ETND0307F	TWP08S	3/8
	037197T-S050	3/8	1/2	0.335	1.969	5.906			
	050236T-S050	1/2	5/8	0.433	2.362	6.299	ETND03509	TWP10S	1/2

Available Inserts E07, E08

Steel Shank(Corner R type)

Straight type

LREA050/062/075/100/125



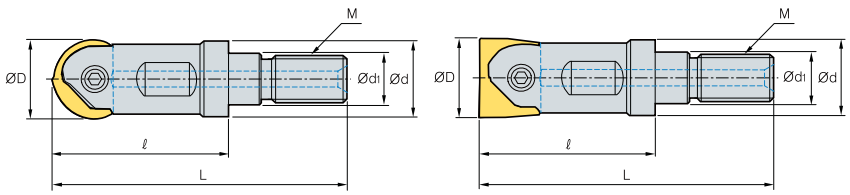
(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench	
LREA	050117S-S050	1/2	1/2	0.433	1.181	4.370	ETND03509	TWP08S	1/2
	062197S-S062	5/8	5/8	0.571	1.969	5.157	ETND0413	TWP15S	5/8
	062236S-S062	5/8	5/8	0.571	2.362	6.299			
	075236S-S075	3/4	3/4	0.689	2.362	5.709	ETKD0516	TWP20	3/4
	075315S-S075	3/4	3/4	0.689	3.150	7.087			
	100276S-S100	1	1	0.906	2.756	5.709	ETKD0620	TWP20	1
	100394S-S100	1	1	0.906	3.937	8.858			
	125315S-S125	1 1/4	1 1/4	1.142	2.756	6.299	ETGD0825	TWP40	1 1/4
	125394S-S125	1 1/4	1 1/4	1.142	3.937	8.858			

Available Inserts **E07, E08**

• T stands for taper type, S stands for straight type

LBEA-MHD



(inch)

Designation		Dimensions						Parts		Available Inserts(Ø)
		M	ØD	L	ℓ	Ød	Ød1	Clamp Screw	Wrench	
LBEA	037-MHD-M06	M06	3/8	1.575	0.984	0.335	0.256	ETND0307F	TWP08S	3/8
	050-MHD-M06	M06	1/2	1.575	0.984	0.433	0.268	ETND03509	TWP10S	1/2
	062-MHD-M08	M08	5/8	1.850	1.181	0.571	0.335	ETND0413	TWP15S	5/8
	075-MHD-M10	M10	3/4	2.205	1.378	0.689	0.413	ETKD0516	TWP20	3/4
	100-MHD-M12	M12	1	2.717	1.772	0.906	0.492	ETKD0620	TWP25	1
	125-MHD-M16	M16	1 1/4	3.031	1.969	1.142	0.650	ETGD0825	TWP40	1 1/4

Designation : LBE320-MHD-M16
Modular Head Threading Measure size(M16)

=

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Available Inserts **E07, E08**

Available Adaptors **E252~E253**

BFEA

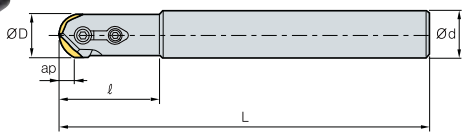


Fig. 1

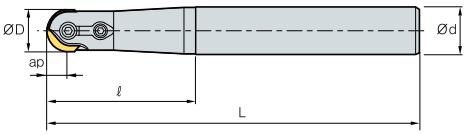


Fig. 2

(inch)

Designation		ØD	Ød	ℓ	L	ap	lbs	Fig.	Available Inserts
BFEA	**062-S**	0.625	0.625	1.417	5.512	0.31	0.44	1	RC062
	062-M	0.625	0.750	2.559	6.693	0.31	0.66	2	
	062-L	0.625	1.000	2.559	7.874	0.31	1.10	2	
	075-S	0.750	0.750	1.772	6.299	0.39	0.88	1	RC075
	075-M	0.750	1.000	3.150	7.874	0.39	1.32	2	
	075-L	0.750	1.000	3.150	9.842	0.39	1.76	2	
	100-S	1.000	1.000	1.772	6.299	0.49	1.54	1	RC100
	100-M	1.000	1.250	3.543	8.268	0.49	2.42	2	
	100-L	1.000	1.250	3.543	11.811	0.49	3.74	2	
	125-S	1.250	1.250	2.205	6.890	0.63	1.98	2	RC125
	125-M	1.250	1.250	3.937	9.842	0.63	3.08	2	
	125-L	1.250	1.250	3.937	13.780	0.63	4.40	2	

Available Inserts

RC

Designation		Coated PC210F	Page
RC	**062**	●	E12
	075	●	
	100	●	
	125	●	

Recommended cutting condition

Workpiece	Cutting Condition	
	vc(sfm)	fz(ipt)
General steel(SS41, SM25C) Over HB180	490~820	0.004~0.012
Alloy steel(SM55C, SCM) Under HB300	330~660	0.004~0.008
Cast iron Under HB300	330~660	0.004~0.012

Parts

Specification	Screw	Clamp	Clamp Screw	Stopper Ring	Wrench
Ø0.625	FTGA0513	CBH4.5R1	CTX04513	ER03	TW20
Ø0.750	FTGA0517	CBH4.5R2	CTX04513	ER03	TW20
Ø1.000	FTGA0621	CBH5R1	CTX0517	ER04	TW20
Ø1.250	FTGA0826	CBH6R1	CTX0621	ER05	TW25

Available Inserts **E12**

GBEA (Single Edge)

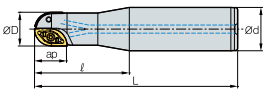


Fig. 1

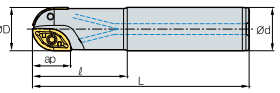


Fig. 2

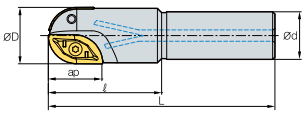


Fig. 2

(inch)

Designation		Dimensions					Available Inserts			Parts				Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Ext. main	Screw		Wrench		
										Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBEA	**063-S075**	0.630	0.750	1.95	5.10	0.6	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-	1
	063-L075	0.630	0.750	3.50	7.90	0.6	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-	1
	071-S075	0.709	0.750	2.35	5.10	0.7	ZPET090M-MM	ZPET090S-MM	-	FTKA0307	-	TW09S	-	1
	071-L075	0.709	0.750	3.15	7.90	0.7	ZPET090M-MM	ZPET090S-MM	-	FTKA0307	-	TW09S	-	1
	079-S100	0.787	1.000	2.35	5.50	0.7	ZPET100M-MM	ZPET100S-MM	-	FTKA0307	-	TW09S	-	1
	079-L100	0.787	1.000	3.10	9.80	0.7	ZPET100M-MM	ZPET100S-MM	-	FTKA0307	-	TW09S	-	1
	086-S100	0.866	1.000	2.75	5.50	0.8	ZPET110M-MM	ZPET110S-MM	-	FTKA0408	-	TW15S	-	1
	086-L100	0.866	1.000	3.95	9.85	0.8	ZPET110M-MM	ZPET110S-MM	-	FTKA0408	-	TW15S	-	1
	098-S125	0.984	1.250	2.70	5.90	0.9	ZPET125M-MM	ZPET125S-MM	-	FTKA0409	-	TW15S	-	1
	098-L125	0.984	1.250	3.90	11.80	0.9	ZPET125M-MM	ZPET125S-MM	-	FTKA0409	-	TW15S	-	1
	102-S125	1.024	1.250	2.75	5.90	1.0	ZPET130M-MM	ZPET130S-MM	-	FTKA0409	-	TW15S	-	1
	102-L125	1.024	1.250	3.95	11.80	1.0	ZPET130M-MM	ZPET130S-MM	-	FTKA0409	-	TW15S	-	1
	110-S125	1.102	1.250	2.75	5.90	1.0	ZPET140M-MM	ZPET140S-MM	-	FTGA0511-P	-	TW20	-	1
	110-L125	1.102	1.250	4.70	11.80	1.0	ZPET140M-MM	ZPET140S-MM	-	FTGA0511-P	-	TW20	-	1
	118-S125	1.181	1.250	2.70	6.30	1.0	ZPET150M-MM	ZPET150S-MM	-	FTGA0511-P	-	TW20-100	-	2
	118-L125	1.181	1.250	4.70	13.80	1.0	ZPET150M-MM	ZPET150S-MM	-	FTGA0511-P	-	TW20-100	-	2
	126-S125	1.260	1.250	2.70	6.30	1.1	ZPET160M-MM	ZPET160S-MM	-	FTGA0511-P	-	TW20-100	-	2
	126-L125	1.260	1.250	4.70	13.80	1.1	ZPET160M-MM	ZPET160S-MM	-	FTGA0511-P	-	TW20-100	-	2
	157-S150	1.575	1.500	3.90	7.90	1.4	ZPET200M-MM	ZPET200S-MM	-	FTGA0614	-	TW20-100	-	2
	157-L150	1.575	1.500	5.90	13.80	1.4	ZPET200M-MM	ZPET200S-MM	-	FTGA0614	-	TW20-100	-	2
	197-S150	1.969	1.500	3.90	7.90	1.8	ZPET250M-MM	ZPET250S-MM	-	FTGA0818	-	TW25-100	-	3
	197-L150	1.969	1.500	3.90	13.80	1.8	ZPET250M-MM	ZPET250S-MM	-	FTGA0818	-	TW25-100	-	3

GBEA-M (Multi Edge)

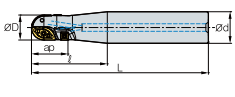


Fig. 1

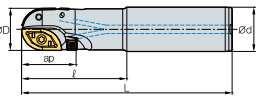


Fig. 2

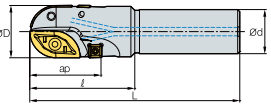


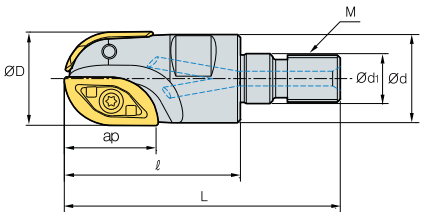
Fig. 3

(inch)

Designation		Dimensions					Available Inserts			Parts				Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Ext. main	Screw		Wrench		
										Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBEA	**079M-S100**	0.787	1.000	2.75	5.90	1.1	ZPET100M-MM	ZPET100S-MM	SPMT221	FTKA0307	ETNA02506	TW09S	TW07P	1
	079M-L100	0.787	1.000	2.75	9.80	1.1	ZPET100M-MM	ZPET100S-MM	SPMT221	FTKA0307	ETNA02506	TW09S	TW07P	1
	086M-S100	0.866	1.000	3.15	5.90	1.2	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	4
	086M-L100	0.866	1.000	3.15	9.85	1.2	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	4
	098M-S125	0.984	1.250	3.10	7.10	1.3	ZPET125M-MM	ZPET125S-MM	SPMT221	FTKA0409	ETNA02506	TW15S	TW07P	1
	098M-L125	0.984	1.250	3.10	11.80	1.3	ZPET125M-MM	ZPET125S-MM	SPMT221	FTKA0409	ETNA02506	TW15S	TW07P	1
	102M-S125	1.024	1.250	3.15	7.10	1.5	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	4
	102M-L125	1.024	1.250	3.15	11.80	1.5	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	4
	110M-S125	1.102	1.250	3.15	7.10	1.6	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	4
	110M-L125	1.102	1.250	3.15	11.80	1.6	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	4
	118M-S125	1.181	1.250	3.90	7.90	1.6	ZPET150M-MM	ZPET150S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	1
	118M-L125	1.181	1.250	3.90	13.80	1.6	ZPET150M-MM	ZPET150S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	1
	126M-S125	1.260	1.250	3.90	7.90	1.6	ZPET160M-MM	ZPET160S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	2
	126M-L125	1.260	1.250	3.90	13.80	1.6	ZPET160M-MM	ZPET160S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	2
	157M-S150	1.575	1.500	3.90	7.90	2.2	ZPET200M-MM	ZPET200S-MM	SPMT432-MM	FTGA0614	ETNA0511	TW20-100	TW20S	2
	157M-L150	1.575	1.500	3.90	13.80	2.2	ZPET200M-MM	ZPET200S-MM	SPMT432-MM	FTGA0614	ETNA0511	TW20-100	TW20S	2
	197M-S150	1.969	1.500	3.90	7.90	2.6	ZPET250M-MM	ZPET250S-MM	SPMT432-MM	FTGA0818	ETNA0511	TW25-100	TW20S	3
	197M-L150	1.969	1.500	3.90	13.80	2.6	ZPET250M-MM	ZPET250S-MM	SPMT432-MM	FTGA0818	ETNA0511	TW25-100	TW20S	3

Available Inserts **E23**

GBEMA



(inch)

Designation		Dimensions							Available Inserts	
		ØD	Ød	Ød1	ℓ	L	M	ap	Internal	External
GBEMA	063-M08	0.630	0.591	0.335	1.2	1.9	M08	0.6	ZPET080M-MM	ZPET080S-MM
	079-M10	0.787	0.732	0.413	1.4	2.2	M10	0.7	ZPET100M-MM	ZPET100S-MM
	098-M12	0.984	0.913	0.492	1.8	2.7	M12	0.9	ZPET125M-MM	ZPET125S-MM
	118-M16	1.181	1.094	0.669	2.0	3.0	M16	1.0	ZPET150M-MM	ZPET150S-MM
	126-M16	1.260	1.173	0.669	2.0	3.0	M16	1.1	ZPET160M-MM	ZPET160S-MM

Available Inserts

ZPET-M

ZPET-S

SPMT

SPMT-MM

Designation		Coated				Page
		NCM325	PC3500	PC5300	PC3545	
ZPET	080M-MM					E23
	090M-MM					
	100M-MM		●	●		
	110M-MM					
	125M-MM		●	●		
	130M-MM					
	140M-MM					
	150M-MM		●	●		
	160M-MM		●	●		
	200M-MM		●			
	250M-MM					
ZPET	080S-MM					
	090S-MM					
	100S-MM		●	●		
	110S-MM					
	125S-MM		●	●		
	130S-MM					
	140S-MM					
	150S-MM		●	●		
	160S-MM		●	●		
	200S-MM		●			
	250S-MM					
SPMT	221	●				E20
SDMT	322-MM		●	●		E14
SPMT	432-MM		●	●	●	E20

Parts

Specification	Screw		Wrench		Cutter Dia.
	Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
Ø0.630	FTKA02555	-	TW08S	-	Ø0.630
Ø0.787	FTKA0307	ETNA02506	TW09S	TW07P	Ø0.787
Ø0.984	FTKA0409	ETNA02506	TW15S	TW07P	Ø0.984
Ø1.181	FTGA0511-P	ETNA0408	TW20-100	TW15S	Ø1.181
Ø1.260	FTGA0511-P	ETNA0408	TW20-100	TW15S	Ø1.260

Designation : GBEM320-M16
Modular Head Threading Measure size(M16)

"

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Available Inserts E14, E20, E23

Available Adaptors E252~E253

BREA

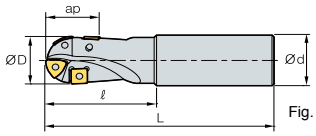


Fig. 1

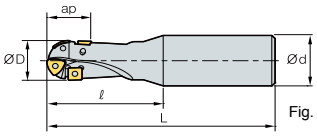


Fig. 2

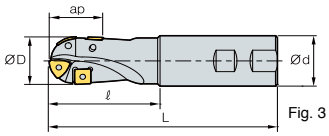


Fig. 3

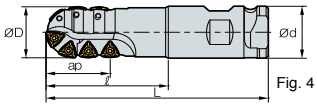


Fig. 4


• AR : 0°~10°
• RR : -3°~0°

(inch)

Designation		Dimensions					Available Inserts		Parts		lbs	Fig.
		ØD	Ød	ℓ	L	ap	Main	Ext. main	Screw	Wrench		
BREA	079-S	0.787	3/4	0.787	4.921	0.03	ZDMT08T2-R10-MM	SPMT221	ETNA02506	TW07P	0.3	1
	079-M	0.787	3/4	0.787	5.906	0.03					0.3	1
	079-L	0.787	1	0.787	7.874	0.03					0.3	2
	079-SL	0.787	1	0.787	4.921	0.03					0.3	3
	098-S	0.984	1	0.906	5.906	0.04	ZDMT110312.5R-MM	SPMT221	ETNA02506	TW07P	0.5	1
	098-M	0.984	1	0.906	6.890	0.04					0.5	1
	098-L	0.984	1 1/4	0.906	7.874	0.04					0.4	2
	098-SL	0.984	1	0.906	5.315	0.04					0.4	3
	126-S	1.260	1 1/4	1.220	6.890	0.05	ZDMT130416R-MM	SDMT322-MM	ETNA0408	TW15S	0.9	1
	126-M	1.260	1 1/4	1.220	7.874	0.05					0.9	1
	126-L	1.260	1 1/4	1.220	9.843	0.05					0.7	1
	126-SL	1.260	1 1/4	1.220	5.906	0.05					0.7	3
	157-S	1.575	1 1/2	1.614	6.890	0.06	ZPMT160520R-MM	SPMT432-MM SPMT442-MMN	ETNA0511	TW20-100	1.3	1
	157-S-150	1.575	1 1/2	1.614	6.890	0.06					1.3	1
	157-M	1.575	1 1/2	1.614	7.874	0.06					1.3	1
	157-M-150	1.575	1 1/2	1.614	7.874	0.06					1.3	1
	157-L	1.575	1 1/2	1.614	9.843	0.06					1.3	1
	157-L-150	1.575	1 1/2	1.614	9.843	0.06					1.3	1
	157-SL	1.575	1 1/2	1.614	6.299	0.06					1.3	3
	157-SL-150	1.575	1 1/2	1.614	6.299	0.06					1.3	3

Available Inserts

SDMT-MM SPMT SPMT-MM ZDMT-R-MM ZPMT-R-MM ZPMT-R-MR

Designation		Coated						Page
		NCM325	PC3500	PC5300	PC3525	PC3545	PC6510	
SDMT	322-MM		●	●				E14
SPMT	221	●						E20
	432-MM		●	●		●		
	442-MMN							
ZDMT	08T2-R10-MM		●	●				E23
	110312.5R-MM		●	●				
	130416R-MM		●	●				
ZPMT	160520R-MM		●	●				
	160525R-MM		●	●				
	160525R-MR							
	160531.5R-MM		●	●				

Parts

Specification	Screw	Wrench	Wrench
Ø0.787~Ø1.575	ETNA02506* ETNA0408** ETNA0511	TW15S** TW20-100	TW07P*

Available Inserts E14, E20, E23

Recommended cutting condition

Machining • Slotting-A • Shouldering(general cutting edge)-B • Shouldering(long cutting edge)-C

Workpiece		Hardness	Cutting Condition		Mach-ining
			vc(sfm)	fz(ipt)	
P	Carbon steel, Alloy steel (S50, SCM440)	180 ~ 280HB	860(590 ~ 1020)	0.005 (0.004~0.006)	A
				0.006 (0.004~0.008)	B
			790(530 ~ 960)	0.004 (0.002~0.006)	C
		280 ~ 380HB	630(430 ~ 760)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			560(400 ~ 660)	0.004 (0.002~0.006)	C
	Pre-Hardened (NAK55)	35 ~ 45HRC	560(360 ~ 630)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			530(360 ~ 590)	0.004 (0.002~0.006)	C
	High alloy steel (STD, STT)	≤300HB	630(430 ~ 760)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			530(360 ~ 590)	0.004 (0.002~0.006)	C
M	Stainless steel (STS4202J)	≤260HB	860(590 ~ 1020)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			790(530 ~ 960)	0.004 (0.002~0.006)	C
K	General cast iron (GC250)	Tensile strength ≤350MPa	860(590 ~ 1020)	0.006 (0.004~0.008)	A
				0.006 (0.004~0.008)	B
			790(530 ~ 960)	0.004 (0.002~0.006)	C
	Ductile cast iron (GCD450)	Tensile strength 360~500MPa	660(460 ~ 790)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			630(430 ~ 760)	0.004 (0.002~0.006)	C
	Ductile cast iron (GCD450)	Tensile strength 500~800MPa	560(330 ~ 660)	0.004 (0.002~0.006)	A
				0.006 (0.004~0.008)	B
			490(360 ~ 590)	0.004 (0.002~0.006)	C
H	Hardened steel (STD, STT)	45 ~ 60HRC	360(230 ~ 430)	0.006 (0.004~0.008)	A
				0.006 (0.004~0.008)	B
			330(200 ~ 400)	0.004 (0.002~0.006)	C

All applications for chamfers

Chamfer Tool

- All chamfer applications
- Chamfer angles 15°, 30°, 45°, 60° for various customer's needs
- The long cutting edge provides a wide chamfering range

Back & Front Champer Tools

Long Champer Tools

Code System

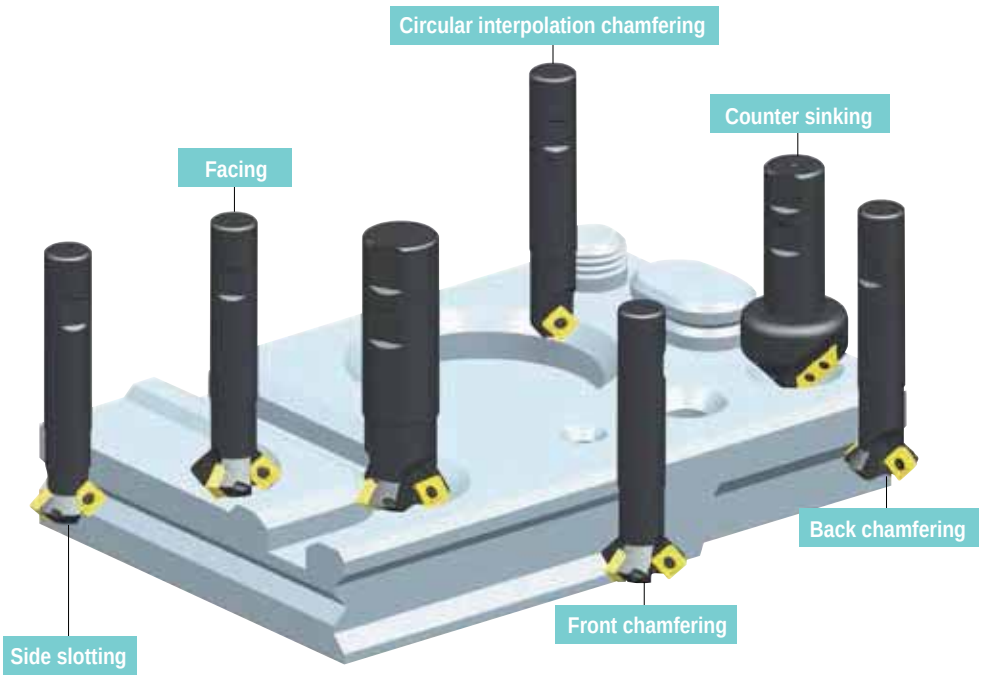
CEA 45 – 11 100 R – S 075

Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	11 : SPMT110408-KC 12 : SPMN120308 31 : XCET310404ER-KC	Ø1 inch	R: Right L: Left	S : Standard M : Middle L : Long	Ø0.75 inch

Recommended cutting condition

Workpiece	Grades	ØD (Ø0.20 ~Ø0.79)		ØD (Ø0.10 ~Ø1.38)	
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
P	PC3500	350~550	0.002~0.020	350~550	0.002~0.020
	PC5300				
	ST30A				
M	PC5300	300~400	0.002~0.008	300~400	0.004~0.012
	PC3545				
K	PC5300	350~550	0.004~0.012	350~550	0.019~0.020
	G10				

Application example



Multi-functional Chamfer Tool

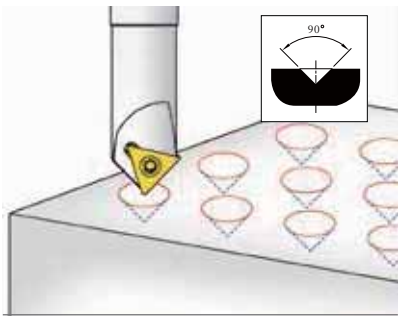
Code System

CEA 45 – 16 00 R – S 075

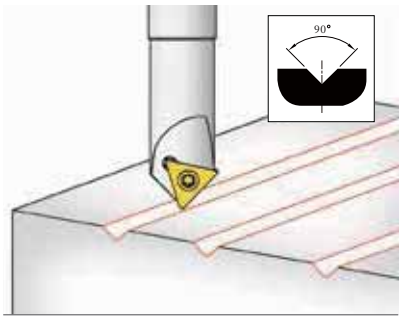
Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	16 : TWX16R-KC 22 : TWX22R-KC	Ø0	R : Right L : Left	S : 90,110 L : 200	Ø0.75 inch

Application area and Recommended cutting condition

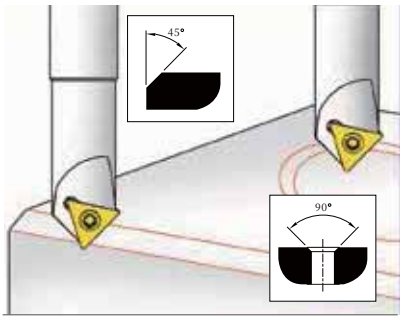
Centering



Grooving



Chamfering



Workpiece	Hardness (HRC)	Centering, Grooving		Chamfering	
		vc (ipm)	fz (ipt)	vc (ipm)	fz (ipt)
Mild steel, Carbon steel, Alloy steel	Under HRC 30	360~655	0.0004~0.0016	330~820	0.0016~0.0024
High Carbon steel, Alloy steel	HRC 30~40	490~820	0.0008~0.0024	490~985	0.0020~0.0039
Aluminum, Copper	-	490~985	0.0016~0.0031	490~1,150	0.0020~0.0039
Cast iron	-	260~490	0.0008~0.0024	330~820	0.0020~0.0039
Stainless steel	-	195~395	0.0004~0.0012	195~490	0.0012~0.0024
HRSA		195~260	0.0004~0.0012	195~330	0.0012~0.0024

Note) Please keep fz. Backtouch & Chipping one caused by wrong fz

Machining Example

Chamfering

Grooving

Centering

CEA (Back & Front)

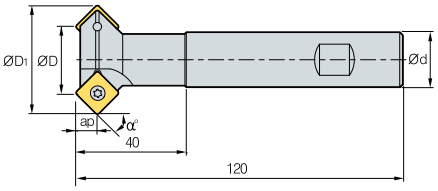


Fig. 1

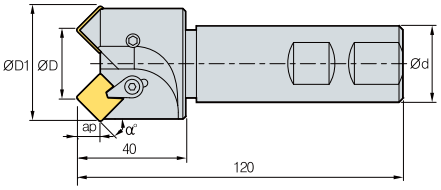


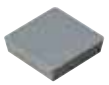
Fig. 2

(inch)

Designation			ØD	ØD1	Ød	ap	Fig.	Available Inserts	α°(Chamfer angle)		Machining range (Min~Max)	Uses
									Front	Back		
CEA	**15-11100R-S075**	2	1	1.217	3/4	0.374	1	SPMT110408 - KC	15°	-	Ø1.00~Ø1.18	Front chanfering
	30-11100R-S075	2	1	1.413	3/4	0.335	1		30°	60°	Ø1.00~Ø1.37	Front, Back chanfering
	45-11028R-S075	1	9/32	0.868	3/4	0.276	1		45°	-	Ø0.28~Ø0.82	Front chanfering
	45-11075R-S075	2	3/4	1.337	3/4	0.276	1		45°	45°	Ø0.75~Ø1.29	Front, Back chanfering
	45-11100R-S075	3	1	1.587	3/4	0.276	1		45°	45°	Ø1.00~Ø1.53	Front, Back chanfering
	60-11100R-S125	3	1	1.72	1 1/4	0.197	1		60°	30°	Ø1.00~Ø1.65	Front, Back chanfering
	45-12028R-S125	1	9/32	0.923	1 1/4	0.307	2	SPMN422	45°	-	Ø0.28~Ø0.86	Front chanfering
	45-12075R-S125	2	3/4	1.431	1 1/4	0.307	2		45°	-	Ø0.75~Ø1.41	Front chanfering
	45-12100R-S125	2	1	1.681	1 1/4	0.307	2		45°	-	Ø1.00~Ø1.61	Front chanfering
	45-12137R-S125	2	1 3/8	2.056	1 1/4	0.307	2		45°	-	Ø1.37~Ø2.00	Front chanfering

Available Inserts

SPMT-KC



SPMN

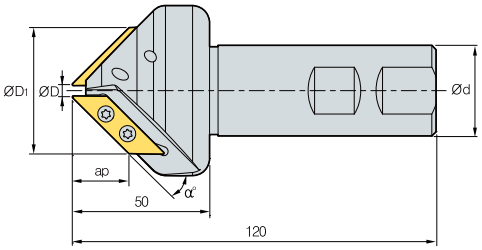
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	**110408-KC**					●							●	●		E21
SPMN	**422**															

Parts

Specification	Screw	Clamp	C-Ring	Wrench	Wrench
Ø1~Ø9/32 (11□□□type)	FTKA0408	-	-	TW15S	-
Ø9/32~Ø1 3/8 (12□□□type)	CHX0617L	CH6R2	CR05	-	HW30L

Available Inserts **E21**

CEA (Long Champer)



• AR : -5°~1°
• RR : 0°

(inch)

Designation			ØD	ØD1	Ød	ap	α° (Chamfer angle)	Machining range (Min~Max)	Uses
CEA	**30-31020R-S125**	1	13/64	1.384	1 1/4	1.039	30°	Ø0.20~Ø1.37	Front Chamfering
	45-31020R0-S125	2	13/64	1.896	1 1/4	0.846	45°	Ø0.20~Ø1.89	Front Chamfering
	60-31020R-S125	2	13/64	2.278	1 1/4	0.598	60°	Ø0.20~Ø2.27	Front Chamfering

Available Inserts

XCET-KC

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XCET	**310404ER-KC**					●							●	●		E22

Parts

Specification	Screw	Wrench
Ø13/64	FTKA03510	TW15S

Available Inserts **E22**

CEA (Multi-functional)

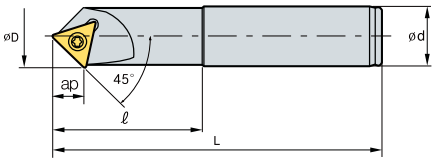


Fig. 1

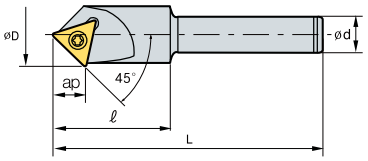


Fig. 2

- AR : -12°~15°
- RR : 0°

(inch)

Designation		ØD	Ød	ℓ	L	ap	Fig.	Available Inserts	Machining range (Min~Max)	Uses
CEA	**45-1600R-S050**	0.87	0.50	1.6	3.5	0.4	2	TWX16R-KC	Ø0.8	Centering Grooving Chamfering
	45-1600R-S075	0.87	0.75	2.0	4.5	0.4	1	TWX16R-KC	Ø0.8	
	45-1600R-L075	0.87	0.75	2.4	8.0	0.4	1	TWX16R-KC	Ø0.8	
	45-2200R-S050	1.14	0.50	1.6	3.5	0.6	2	TWX22R-KC	Ø1.1	
	45-2200R-S100	1.14	1.00	2.0	4.5	0.6	1	TWX22R-KC	Ø1.1	
	45-2200R-L100	1.14	1.00	2.4	8.0	0.6	1	TWX22R-KC	Ø1.1	

Available Inserts

TWX-KC

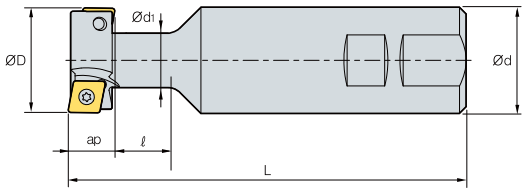
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TWX	**16R-KC**					●										E22
	22R-KC					●										

Parts

Specification	Screw	Wrench
Ø0.87~Ø1.14	FTNA0408	TW15L

Available Inserts **E22**

TFEA



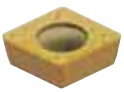
AA 90°

- AR : 5°
- RR : -5°

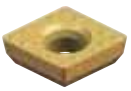
(inch)

Designation			ØD	Ød	Ød1	ℓ	L	ap	Available Inserts
TFEA	083100R/L	2	0.83	1.00	0.41	0.79	4.25	0.35	CPMT21.51-MM
	098100R/L	2	0.98	1.00	0.49	0.83	4.50	0.43	CPMT21.51-MM
	126125R/L	2	1.26	1.25	0.65	1.02	5.00	0.55	CPMT2.522-MM
	157125R/L	2	1.57	1.25	0.81	1.26	5.25	0.71	CPMT32.52-MM
	197125R/L	4	1.97	1.25	1.00	1.50	5.50	1.30	CPMH432-MM

Available Inserts



CPMT

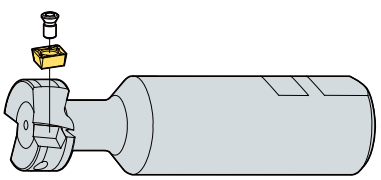


CPMH

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
CPMT	21.51-MM					●										E07
	2.522-MM					●										
	32.52-MM					●										
CPMH	432-MM					●										

Parts

Specification	Screw	Wrench
Ø0.83	FTNA02555	TW08S
Ø0.98	FTNA0306	TW09S
Ø1.26	FTNA0407	TW15S
Ø1.57	PTMA0511A	TW15S
Ø1.97		

Assembling	

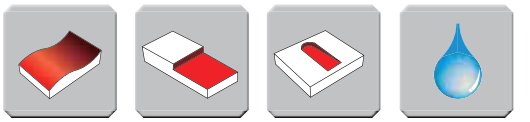
Available Inserts E07

Buffed on top face of insert ensure good chip control and reduces built-up edge

Pro-A Mill

- Buffed top face of insert ensures good chip control and reduces built-up edge
- Small size modular type for aluminum machining
- Various line up of modular system for aluminum machining
- For shouldering, curved surface and ramping
- High rake angle chip breaker ensures excellent surface roughness improved cooling effect, and chip control by through coolant system, even in deep pocket machining

Uses



Copying | Shouldering | Ramping | Through coolant system

Pro-A Mill series

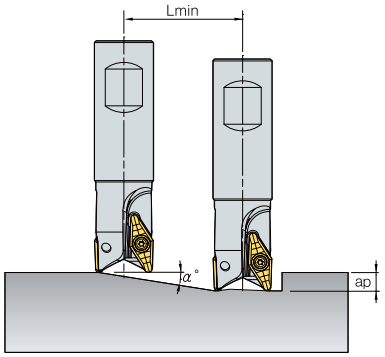
Type	Series	Pro-A mill	Through coolant system
Application of small-sized Aluminum machining	**Pro-A 2000**	 • Modular : Ø1/2~Ø1 1/2 • Shank : Ø1/2~Ø1 1/2 • Insert : VDKT11T210N-MA VDKT11T220N-MA	O
General application of Aluminum machining	**Pro-A 4000**	 • cutter : Ø1 1/2~Ø4 • Shank : Ø5/8~Ø1 1/2 • Insert : VCKT220530N-MA	O

Recommended cutting condition

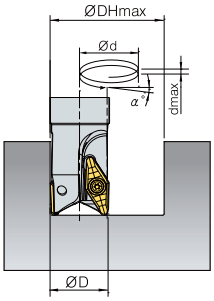
Workpiece		Cutting speed vc(sfm)
Aluminum alloy	Rm < 280 MPa	3300
	Rm > 280 MPa	2640
Copper alloy	Long chip	830
Thermo plastic	-	990
Aluminum alloy	Si < 12%	2640
Copper alloy	Short chip	1320
Magnesium alloy	-	1320
Duroplastics	-	500

Pro-A Mill Ramping & Helical cutting technical data

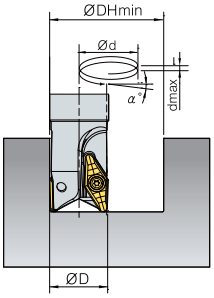
1. Ramping



2. Blind hole Helical cutting



3. Thru hole Helical cutting



Designation	ØD(Inch)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α°(max)	Lmin(Inch)	ØDHmax(Inch)	dmax(Inch)	ØDHmin(Inch)	dmax(Inch)	ØDHmin(Inch)	dmax(Inch)
PASA2012HR	0.500	11.1	1.606	0.961	0.007	0.882	0.007	0.803	0.006
PASA2016HR	0.625	12.6	1.404	1.211	0.011	1.132	0.010	1.053	0.009
PASA2020HR	0.750	10.3	1.738	1.461	0.010	1.382	0.010	1.303	0.009
PASA2025HR	1.000	7.5	2.404	1.961	0.010	1.882	0.010	1.803	0.009
PASA2032HR	1.250	5.9	3.071	2.461	0.010	2.382	0.010	2.303	0.009
PASA2042HR	1.500	4.8	3.738	2.961	0.010	2.882	0.010	2.803	0.009
PASA4032HR	1.250	18.9	0.921	2.461	0.033	2.382	0.032	2.303	0.031
PASA4040HR	1.500	15.7	1.121	2.961	0.033	2.882	0.032	2.803	0.031
PASA4050HR	2.000	11.7	1.521	3.961	0.032	3.882	0.032	3.803	0.031
PASA4063HR	2.500	9.3	1.921	4.961	0.032	4.882	0.032	4.803	0.031
PACA4080HR	3.000	7.7	2.321	5.961	0.032	5.882	0.031	5.803	0.031
PACA4100HR	4.000	5.8	3.121	7.961	0.032	7.882	0.031	7.803	0.031

- Lmin : When ap=0.315inch
- Lmin : Minimum inclination cutting length

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

α° : Max. rampig angle

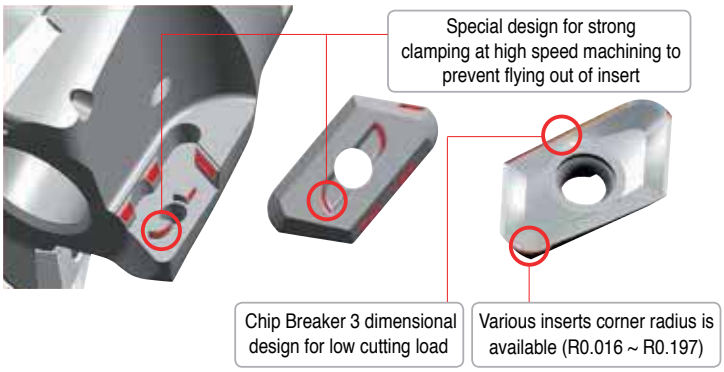
ap : Depth of cut

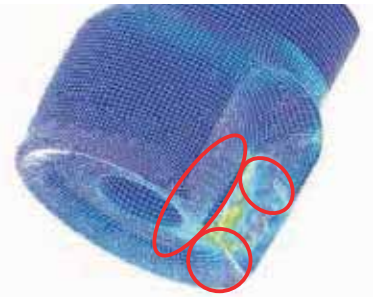
Strong clamping due to the concave design of insert bottom

Pro-X Mill

- Strong clamping due to the concave design of insert bottom
- Good chip flow and less build up edge acheived with the buffed surface of insert
- High rake angle of insert provides good surface finish and low cutting load
- Specially designed for high speed machining of aluminum
- Suitable for square shouldering and curved surface machining

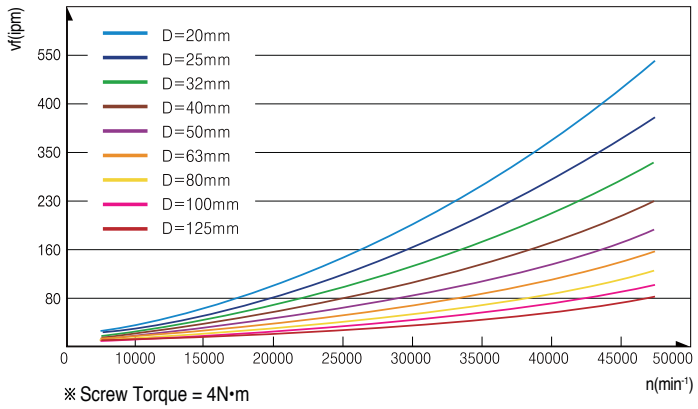
Clamping system for high speed





• Clamping design as per FEM analysis
• Strong clamping of insert

Centrifugal force as per RPM



※ Screw Torque = 4N•m
※ Indexable insert : 6.8g

Marking [• Designation • Max. RPM]

Max. RPM as per cutting diameter

Cutting diameter ØD(inch)	5000 type		6000 type	
	n(min-1)	vc(sfm)	n(min-1)	vc(sfm)
3/4	14,000	3080	-	3080
1	28,000	8400	10,000	8400
1 1/4	25,000	9500	8,900	9500
1 1/2	22,000	10630	19,000	10630
2	20,000	11850	16,000	11850
2 1/2	18,000	13300	15,000	13300
3	16,000	15000	13,000	15000
4	14,000	16800	11,000	16800
5	13,000	18800	10,000	18800

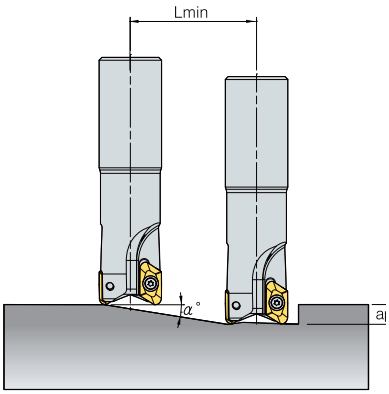
※ In case of actual machining accidental breakage of insert or tool could happen even under the written RPM special cover or door is necessary to prevent damage from broken insert or broken tool

Recommended cutting condition

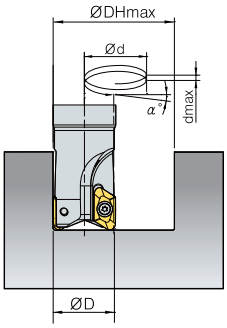
Workpiece		Cutting Speed vc(sfm)	Feed fz(ipt)
Aluminum alloy	Rm280 < MPa Rm280 > MPa	3960 3300	0.012 0.010
Copper alloy Thermo plastic	Long chipping -	1320 1150	0.008 0.006
Aluminum alloy	Si <12% Si ≥12%	3300 -	0.010 -
Copper alloy	Short chipping	1650	0.008
Magnesium alloy	-	1480	0.008
Duroplastics	-	680	0.006

Pro-X Mill Ramping & Helical cutting technical data

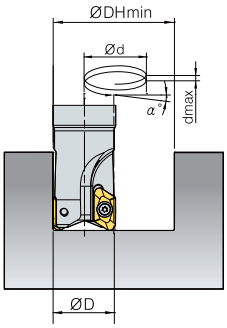
1. Ramping



2. Blind hole Helical cutting



3. Thru hole Helical cutting



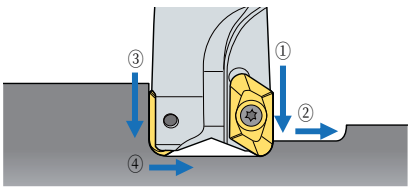
Designation	ØD(inch)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α°(max)	Lmin(inch)	ØDHmax(inch)	dmax(inch)	ØDHmin(inch)	dmax(inch)	ØDHmin(inch)	dmax(inch)
PAXSA5075HR	0.75	9.1	2.47	1.264	0.008	1.185	0.007	0.988	0.006
PAXSA5100HR	1.00	11.9	1.86	1.764	0.015	1.685	0.014	1.488	0.012
PAXSA5125HR	1.25	9.0	2.49	2.264	0.014	2.185	0.014	1.988	0.012
PAXSA5150HR	1.50	7.2	3.11	2.764	0.014	2.685	0.013	2.488	0.012
PAXCA5200HR	2.00	5.2	4.36	3.764	0.013	3.685	0.013	3.488	0.012
PAXCA5250HR	2.50	4.0	5.61	4.764	0.013	4.685	0.013	4.488	0.012
PAXCA5300HR	3.00	3.3	6.86	5.764	0.013	5.685	0.013	5.488	0.012
PAXCA5400HR	4.00	2.4	9.36	7.764	0.013	7.685	0.013	7.488	0.012
PAXCA5500HR	5.00	1.9	11.86	9.764	0.013	9.685	0.013	9.488	0.012
PAXSA6100HR	1.00	9.0	2.48	1.764	0.011	1.685	0.011	1.488	0.009
PAXSA6125HR	1.25	6.8	3.31	2.264	0.011	2.185	0.010	1.988	0.009
PAXSA6150HR	1.50	10.8	2.07	2.764	0.021	2.685	0.020	2.488	0.019
PAXCA6200HR	2.00	7.7	2.91	3.764	0.020	3.685	0.020	3.488	0.019
PAXCA6250HR	2.50	6.0	3.74	4.764	0.020	4.685	0.019	4.488	0.019
PAXCA6300HR	3.00	4.9	4.57	5.764	0.020	5.685	0.019	5.488	0.019
PAXCA6400HR	4.00	3.6	6.24	7.764	0.019	7.685	0.019	7.488	0.019
PAXCA6500HR	5.00	2.9	7.91	9.764	0.019	9.685	0.019	9.488	0.019

- Lmin : When ap=0.394inch
- Lmin : Minimum inclination cutting length

$$Lmin = \frac{ap}{\tan \alpha^\circ} (inch)$$

α° : Max. rampig angle
ap : Depth of cut

Plunging, Slotting, Drilling technical data



1. When drilling, grooving machining sequence is ① → ② → ③ → ④
2. When drilling, grooving, decrease the feed and cutting speed 30%~50% from the recommended data

• Cutting condition for drilling

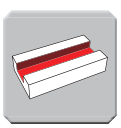
Holder	ap(inch)	
	5000 Type	6000 Type
Ø3/4	0.315	-
Ø1	0.157	0.433
Ø1 1/4	0.157	0.236
Ø1 1/2~5	0.157	0.236

Insert	ap(inch)
XETK19	0.157
XETK25	0.236

Uses


Copying


Helical cutting


Slotting & Shouldering

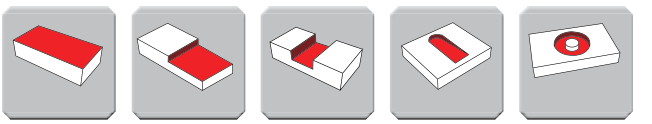

Ramping

New indexable milling tool for the machining of high quality workpieces

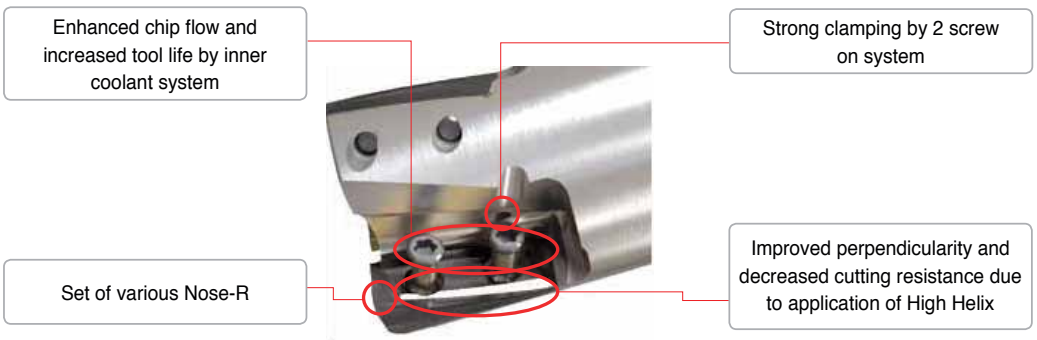
Pro-L Mill New

- Improved perpendicularity and lower cutting resistance by composition of clearance face and High Helix edge
- Productivity increase due to more than half as much of Depth of Cut comparing to existing product
- Strong clamping design by adaption of double screw on system
- Improved chip flow due to helical type design of chip pocket and application of coolant system

Uses



Features



Code System of Shank type

PAL	S	A	200	H	R – 3	S	200
Pro-L Mill	Tool type	Unit	Tool Dia.	Coolant type	Hand	No. of tooth	Tool length	Shank Dia.
	S : Shank	M : Metric A : Inch	200 : Ø2	Unmarked : None H : Thru-hole	R : Right L : Left M : Multi edge	3 : 3 teeth	S : Standard type M : Middle type L : Long type	200 : Ø2

Code System of Cutter type

PAL	C	A	250	H	R
Pro-L Mill	Tool type	Unit	Tool Dia.	Coolant type	Hand
	C : Cutter	M : Metric A : Inch	250 : Ø2.5	H : Thru-hole Unmarked : No Thru-hole	R : Right M : Multi edge

Chip breakers

Usage	Insert's type		Edge type	Features
Al	MA			Application of the edge optimized for Aluminum machining and buffed finish ensure excellent machining quality
Hard-to-cut material	ML			Design of Low cutting resistance Chip Breaker ensures excellent machining quality for light cutting and Hard-to-cut material

Selection of Grade and Chip Breaker

Category	M (Stainless steel)	N (Aluminum alloy)	S (HRSA)
Grade	PC5300 / PC5400	H01	PC5300 / PC5400
MA	-	○	-
ML	○	-	○

Cutting Performance

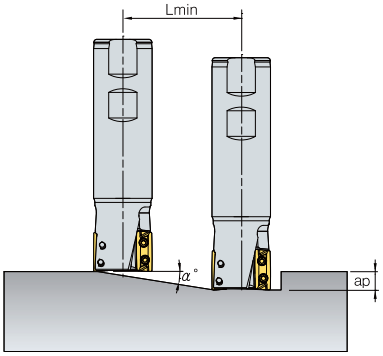
N Al6061 (HRC30)

■ **Cutting condition**

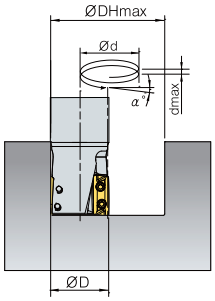
vc = 1640sfm
fz = 0.007inch/t
ap = 1.18~2.36inch
ae = 0.039~0.197inch
z = 3

Pro-L Mill Ramping & Helical cutting technical data

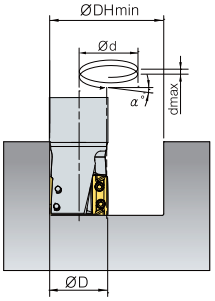
1. Ramping



2. Blind hole Helical cutting



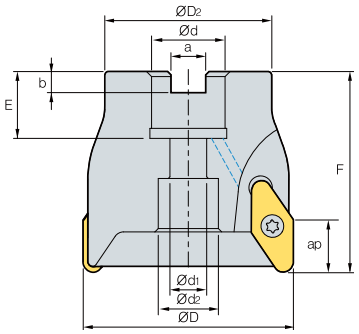
3. Thru hole Helical cutting



Designation	Tool diameter ØD	ap	Ramping		Blind hole Helical cutting			
			Maximum angle (α°)	Lmin(Inch)	Max. Dia ØDHmax	Max. pitch dmax	Min. Dia ØDHmin	MAX. pitch dmax
PALSA125HR-□□□□	1.25	0.984	1.22	37.087	2.441	0.05	60	0.043
PALSA150HR-□□□□	1.5	0.984	0.88	51.142	3.071	0.05	76	0.043
PALSA200HR-□□□□	2	1.339	0.85	80.039	3.858	0.06	96	0.051
PALSA250HR-□□□□	2.5	1.339	0.64	105.71	4.882	0.06	122	0.051

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} (mm)$$

PACA2000/4000



AA 0°

- AR : 0°
- RR : -3°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
PACA	**4150R**	3	1.50	1.378	0.50	0.287	0.433	0.250	0.169	0.787	2.165	0.591	0.20
	4200R	3	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	2.165	0.591	0.37
	4250R	4	2.50	1.969	0.75	0.413	0.630	0.313	0.220	0.787	2.362	0.591	0.64
	4300R	4	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.984	2.362	0.591	0.83
	4400R	5	4.00	2.874	1.25	0.708	1.024	0.500	0.319	0.866	2.362	0.591	1.60

Available Inserts

VCKT-MA

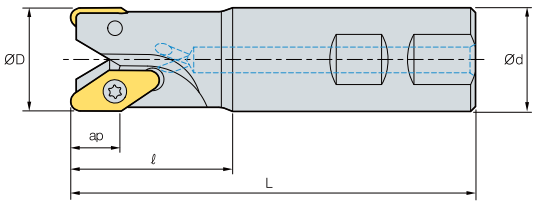
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VCKT	**220530N-MA**														●	E23

Parts

Specification	Screw	Wrench
Ø1.50~Ø4.00	FTNC04509(Ø1.50) FTNC04511	TW 20S

Available Inserts **E22**

PASA2000 / 4000



- AR : 0°~7°
- RR : -21°~-3°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
PASA	**2050R**	1	0.500	0.625	0.25	0.169	0.315	0.10
	2062R	2	0.625	0.625	0.313	0.220	0.315	0.11
	2075R	2	0.75	0.75	0.313	0.220	0.315	0.20
	2100R	3	1.000	1.000	0.375	0.248	0.315	0.36
	2125R	4	1.250	1.250	0.500	0.319	0.315	0.66
	2150R	5	1.500	1.250	0.500	0.319	0.315	0.84
	4125R	2	1.250	1.25	0.500	0.319	0.590	0.60
	4150R	3	1.500	1.25	0.500	0.319	0.590	0.80

Available Inserts

VDKT-MA

VCKT-MA

Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000type	VDKT	**11T210N-MA**														●	E22
4000type	VCKT	**220530N-MA**														●	

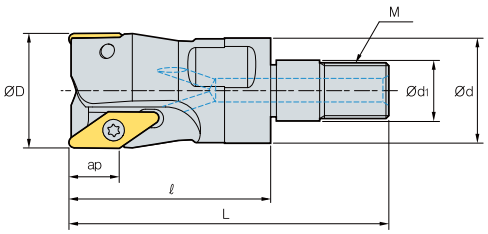
Parts

Specification	Screw	Wrench
Ø0.500~Ø1.500 (2000type)	ETNA02505* ETNA02506	TW 07S
Ø1.250~Ø1.500 (4000type)	FTNC04509	TW 20S

* PASA2050·2062

Available Inserts **E22**

PAMA2000



AA 0°

- AR : 7°~10°
- RR : -21°~-9°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
PAMA	2050HR-M06	1	0.500	0.433	0.256	1.299	1.870	M06	0.315	0.02
	2062HR-M08	2	0.625	0.571	0.335	1.417	2.087	M08	0.315	0.04
	2075HR-M10	2	0.75	0.709	0.413	1.417	2.205	M10	0.315	0.06
	2100HR-M12	3	1.000	0.886	0.492	1.614	2.480	M12	0.315	0.10
	2125HR-M16	4	1.250	1.122	0.669	1.772	2.717	M16	0.315	0.18

Available Inserts

VDKT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VDKT	11T210N-MA														●	E22

Available Adaptors

Designation		Available Adaptors
PAMA	2050HR-M06	MATA - M06
	2062HR-M08	MATA - M08
	2075HR-M10	MATA- M10
	2100HR-M12	MATA - M12
	2125HR-M16	MATA - M16

Designation : PAMA2125HR-M16
Modular Head Threading Measure size(M16)

II

Adaptor Spec. : MATA-M16-354-S125S-C
Adaptor Threading Measure(M16)

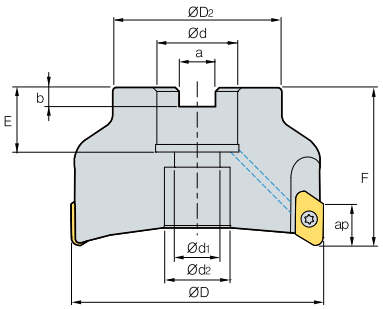
Parts

Specification	Screw	Wrench
Ø0.50~Ø1.250	ETNA02505* ETNA02506	TW 07S

Available Inserts E22 Available Adaptors E252~E253

* PAMA2050·2062

PAXCA5000



AA 0°

- AR : 8°~17.5°
- RR : -9.5°~-5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXCA	5150HR-A,B	3	1.5	1.417	0.50	0.287	0.433	0.252	0.169	0.630	1.50	25,800	0.67	0.15
	5200HR-A,B	4	2.0	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	23,000	0.67	0.30
	5250HR-A,B	A:5, B:4	2.5	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	20,500	0.67	0.56
	5300HR-A,B	5	3.0	2.205	1.00	0.551	0.827	0.374	0.248	0.866	2.00	18,200	0.67	1.00
	5400HR-A,B	6	4.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	16,300	0.67	2.30
	5500HR-A,B	7	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	14,600	0.67	3.20

• A type : Insert NoseR 0.016~0.126 B type : Insert NoseR 0.157~0.197

Available Inserts

XEKT-MA

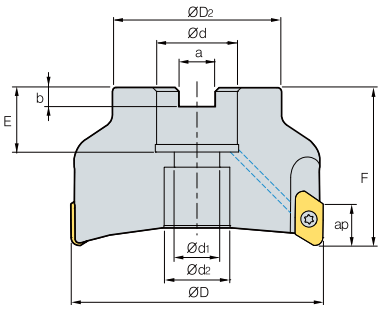
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA											●			●	E22
	19M508FR-MA											●			●	
	19M512FR-MA											●			●	
	19M516FR-MA														●	
	19M518FR-MA															
	19M520FR-MA											●			●	
	19M530FR-MA														●	
	19M532FR-MA											●			●	
	19M540FR-MA											●			●	
	19M550FR-MA											●			●	

Parts

Specification	 Screw	 Wrench
Ø1.5~Ø5.0	PTKA0408	TW 15S

Available Inserts E22

PAXCA6000



AA 0°

- AR : 8°~17.5°
- RR : -9.5°~-5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXCA	6200HR-A,B	2	2.0	1.772	0.75	0.416	0.433	0.315	0.220	0.787	1.75	23,000	0.91	0.32
	6250HR-A,B	3	2.5	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	20,500	0.91	0.53
	6300HR-A,B	4	3.0	2.205	1.00	0.551	1.260	0.374	0.236	0.866	2.00	18,200	0.91	0.73
	6400HR-A,B	5	4.0	2.874	1.25	0.709	1.024	0.510	0.319	0.866	2.50	16,300	0.91	1.70
	6500HR-A,B	6	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	14,600	0.91	3.06

• A type : Insert NoseR 0.016~0.126 B type : Insert NoseR 0.157~0.197

Available Inserts

XEKT-MA

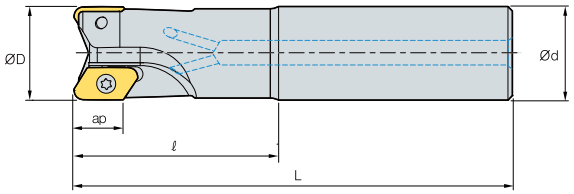
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XEKT	250604FR-MA														●	E22
	250608FR-MA														●	
	250612FR-MA														●	
	250616FR-MA															
	250620FR-MA															
	250630FR-MA															
	250632FR-MA															
	250640FR-MA															
	250650FR-MA														●	

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTGA0513-P	TW 20-100

Available Inserts E22

PAXSA5000



AA 0°

• AR : 5°~10°
• RR : -14°~-5°

(inch)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXSA	**5150HR-A,B**	3	1.5	1.417	0.50	0.287	0.433	0.252	0.169	0.630	1.50	25,800	0.67	0.15
	5200HR-A,B	4	2.0	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	23,000	0.67	0.30
	5250HR-A,B	A:5, B:4	2.5	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	20,500	0.67	0.56
	5300HR-A,B	5	3.0	2.205	1.00	0.551	0.827	0.374	0.248	0.866	2.00	18,200	0.67	1.00
	5400HR-A,B	6	4.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	16,300	0.67	2.30
	5500HR-A,B	7	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	14,600	0.67	3.20

• A type : Insert NoseR 0.016~0.126, B type : Insert NoseR 0.157~0.197

Available Inserts

XEKT-MA

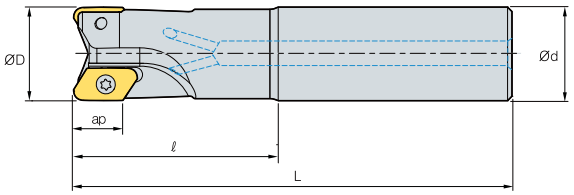
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01	
XEKT	**19M504FR-MA**											●			●	E22
	19M508FR-MA											●			●	
	19M512FR-MA											●			●	
	19M516FR-MA														●	
	19M518FR-MA															
	19M520FR-MA											●			●	
	19M530FR-MA														●	
	19M532FR-MA											●			●	
	19M540FR-MA											●			●	
	19M550FR-MA											●			●	

Parts

Specification	 Screw	 Wrench
Ø1.5~Ø5.0	PTKA0408	TW 15S

Available Inserts **E22**

PAXSA6000



AA 0°

- AR : 5°~10°
- RR : -14°~-5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXSA	6200HR-A,B	2	2.0	1.772	0.75	0.416	0.433	0.315	0.220	0.787	1.75	23,000	0.91	0.32
	6250HR-A,B	3	2.5	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	20,500	0.91	0.53
	6300HR-A,B	4	3.0	2.205	1.00	0.551	1.260	0.374	0.236	0.866	2.00	18,200	0.91	0.73
	6400HR-A,B	5	4.0	2.874	1.25	0.709	1.024	0.510	0.319	0.866	2.50	16,300	0.91	1.70
	6500HR-A,B	6	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	14,600	0.91	3.06

Available Inserts

XEKT-MA

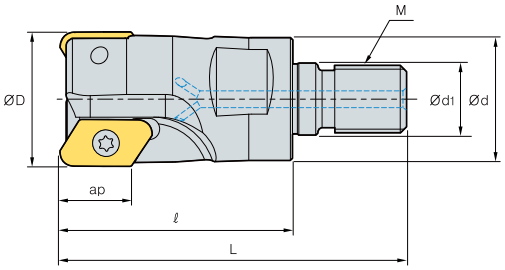
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XEKT	250604FR-MA														●	E22
	250608FR-MA														●	
	250612FR-MA														●	
	250616FR-MA															
	250630FR-MA															
	250632FR-MA															
	250640FR-MA															
	250650FR-MA														●	

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTGA0513-P	TW 20-100

Available Inserts E22

PAXMA5000



AA 0°

• AR : 6°~8°
• RR : -7°~-5°

(inch)

Designation		⊙	ØD	Ød	Ød1	ℓ	L	M	ap	lbs
PAXMA	5100HR-A,B-M12	2	1.00	0.906	0.492	2.165	3.110	M12	0.67	0.12
	5125HR-A,B-M16	2	1.25	1.142	0.669	2.165	3.228	M16	0.67	0.24
	5150HR-A,B-M16	3	1.50	1.142	0.669	2.165	3.228	M16	0.67	0.32

Available Inserts

XEKT-MA

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA											●			●	E22
	19M508FR-MA											●			●	
	19M512FR-MA											●			●	
	19M516FR-MA														●	
	19M518FR-MA															
	19M520FR-MA											●			●	
	19M530FR-MA														●	
	19M532FR-MA											●			●	
	19M540FR-MA											●			●	
	19M550FR-MA											●			●	

Available Adaptors

Designation		Available Adaptors
PAXMA	5100HR-A,B-M12	MATA - M12
	5125HR-A,B-M16	MATA - M16
	5150HR-A,B-M16	

Designation : PAXMA5125HR-M16
Modular Head Threading Measure size(M16)

II

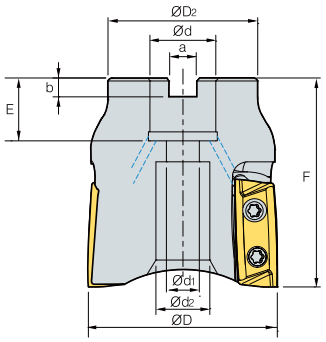
Adaptor Spec. : MATA-M16-354-S125S-C
Adaptor Threading Measure(M16)

Parts

Specification	Screw	Wrench
Ø1.00~Ø1.50	PTKA0407 PTKA0408	TW 15S

Available Inserts E22 Available Adaptors E252~E253

PALCA New



AA 0°

- AR : 16°
- RR : -8°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
PALCA	**250HR**	4	2.5	1.77	0.75	0.413	0.827	0.314	0.22	0.787	1.75	1.339	0.57

Available Inserts

LXET-MA

LXET-ML

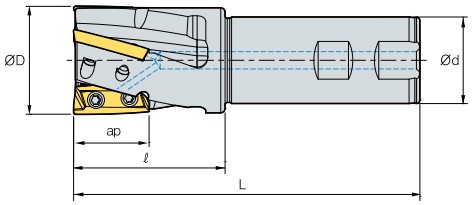
Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø2.50	LXET	340504PEFR-250-MA														●	E10
		3405PEFR-250-MA															
		340512PEFR-250-MA															
		340516PEFR-250-MA															
		340504PEER-250-ML															
		340508PEER-250-ML															
		340512PEER-250-ML															
		340516PEER-250-ML															

Parts

Specification	Screw	Wrench
Ø2.5	FTGA0511-P	TW20-100

Available Inserts E10

PALSA (Single Edge) New



AA 0°

- AR: 12°~16°
- RR : -5°~-9°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
PALSA	125HR-2S100	2	1.25	1.00	1.969	5.512	0.984	1.09
	125HR-2S125	2	1.25	1.25	1.969	5.512	0.984	1.54
	150HR-2S125	2	1.50	1.25	1.969	5.512	0.984	1.73
	150HR-2S150	2	1.50	1.50	1.969	5.512	0.984	2.27
	200HR-3S125	3	2.00	1.25	2.756	6.299	1.339	2.43
	200HR-3S150	3	2.00	1.50	2.756	6.299	1.339	2.97
	250HR-4S125	4	2.50	1.25	2.756	6.299	1.339	3.32
	250HR-4S150	4	2.50	1.50	2.756	6.299	1.339	3.86

Available Inserts

LXET-MA

LXET-ML

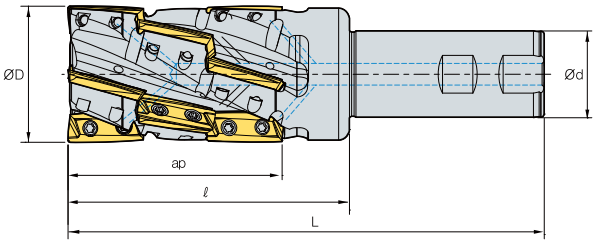
Type	Designation		Cermet		Coated								Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø1.25	LXET	250404PEFR-125-MA															E10
		2504PEFR-125-MA															
		250412PEFR-125-MA															
		250416PEFR-125-MA															
		250404PEER-125-ML															
		2504PEER-125-ML															
		250412PEER-125-ML															
		250416PEER-125-ML															
Ø1.50	LXET	250404PEFR-150-MA															
		2504PEFR-150-MA															
		250412PEFR-150-MA															
		250416PEFR-150-MA															
		250404PEER-150-ML															
		2504PEER-150-ML															
		250412PEER-150-ML															
		250416PEER-150-ML															
Ø2.00	LXET	340504PEFR-200-MA															
		3405PEFR-200-MA															
		340512PEFR-200-MA															
		340516PEFR-200-MA															
		340504PEER-200-ML															
		3405PEER-200-ML															
		340512PEER-200-ML															
		340516PEER-200-ML															
Ø2.50	LXET	340504PEFR-250-MA															
		3405PEFR-250-MA															
		340512PEFR-250-MA															
		340516PEFR-250-MA															
		340504PEER-250-ML															
		340508PEER-250-ML															
		340512PEER-250-ML															
		340516PEER-250-ML															

Parts

Specification	Screw	Wrench	Wrench
Ø1.25	FTKA0408	TW15S	-
Ø1.50	FTKA0410	TW15S	-
Ø2.00	FTGA0510-P	-	TW20-100
Ø2.50	FTGA0511-P	-	TW20-100

Available Inserts E10

PALSA (Multi Edge) New



AA 0°

- AR : 16°
- RR : -8°

(inch)

Designation		⊙	Ød	Ød1	ℓ	L	ap	lbs
PALSA	250HM-4S125	12	2.5	1.25	5.118	8.661	3.78	4.97
	250HM-4S150	12	2.5	1.50	5.118	8.661	3.78	5.51

Available Inserts

LXET-MA

LXET-ML

Type	Designation		Cermet		Coated									Uncoated			Page
			CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø2.50	LXET	340504PEFR-250-MA															E10
		3405PEFR-250-MA															
		340512PEFR-250-MA															
		340516PEFR-250-MA															
		340504PEER-250-ML															
		340508PEER-250-ML															
		340512PEER-250-ML															
		340516PEER-250-ML															

Parts

Specification	Screw	Wrench
Ø2.5	FTGA0511-P	TW20-100

Available Inserts E10

MAT (Steel Shank type)

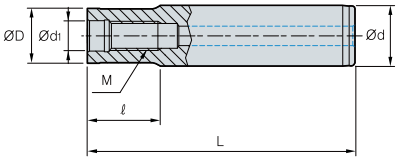


Fig. 1

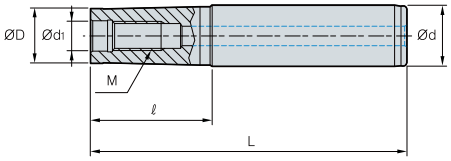


Fig. 2

(inch)

	Designation	ØD	Ød	Ød1	ℓ	L	M	Fig.
MATA	M06-078-S038S	0.354	3/8	0.256	0.787	2.756	M06	1
	M06-157-S050T	0.354	1/2	0.256	1.575	3.780	M06	1
	M06-255-S063T	0.354	5/8	0.256	2.559	4.921	M06	1
	M6B-078-S050S	0.433	1/2	0.256	0.787	2.992	M08	1
	M6B-157-S050S	0.433	1/2	0.256	1.575	3.780	M10	1
	M6B-255-S063T	0.433	5/8	0.256	2.559	4.921	M12	1
	M6B-315-S063T	0.433	5/8	0.256	3.150	5.512	M16	1
	M08-078-S063S	0.571	5/8	0.335	0.787	3.150	M06	2
	M08-157-S063T	0.571	5/8	0.335	1.575	3.937	M06	2
	M08-255-S063T	0.571	5/8	0.335	2.559	4.921	M06	2
	M08-315-S075T	0.571	3/4	0.335	3.150	5.906	M06	2
	M08-433-S100T	0.571	1	0.335	4.331	7.480	M08	2
	M10-118-S075S	0.689	3/4	0.413	1.181	3.937	M08	2
	M10-196-S075T	0.689	3/4	0.413	1.969	4.724	M08	2
	M10-275-S075T	0.689	3/4	0.413	2.756	5.512	M08	2
	M10-354-S100T	0.689	1	0.413	3.543	6.693	M10	2
	M10-433-S100T	0.689	1	0.413	4.331	7.480	M10	2
	M10-511-S125T	0.689	1 1/4	0.413	5.118	8.661	M10	2
	M12-118-S100S	0.906	1	0.492	1.181	4.331	M10	2
	M12-196-S100T	0.906	1	0.492	1.969	5.118	M10	2
	M12-275-S100T	0.906	1	0.492	2.756	5.906	M12	2
	M12-354-S100T	0.906	1	0.492	3.543	6.693	M12	2
	M12-433-S125T	0.906	1 1/4	0.492	4.331	7.874	M12	2
	M12-689-S150T	0.906	1 1/2	0.492	6.890	11.811	M12	2
	M16-137-S125S	1.142	1 1/4	0.669	1.378	4.921	M12	2
	M16-216-S125T	1.142	1 1/4	0.669	2.165	5.709	M16	2
	M16-315-S125T	1.142	1 1/4	0.669	3.150	6.693	M16	2
	M16-472-S125T	1.142	1 1/4	0.669	4.724	8.268	M16	2
	M16-689-S150T	1.142	1 1/2	0.669	6.890	11.811	M16	2

• S : Straight Neck Adaptor • T : Taper Neck Adaptor

FMRMA type

E180, 181, 190

LBEA-MHD type

E222

PAMA type

E243

PAXMA type

E248

AMMA type

E140, 141, 142

RM4PMA type

E82

RM4ZMA type

E84

HRMMA type

E208

HRMDMA type

E202, 203

GBEMA type

E226

Applicable Modular E33 (FMRM, LBEA, PAMA, AMMA, RM4P, RM4Z, HRMM, HRMD, PAXM)

MAT-C(Carbide Shank type)

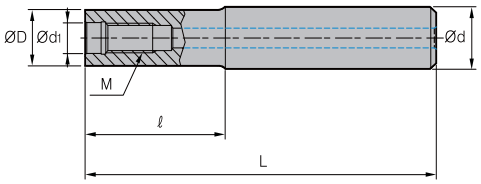


Fig. 1

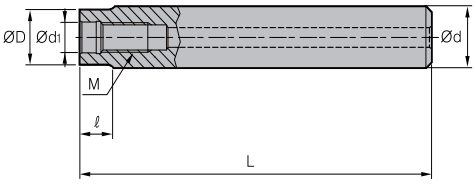


Fig. 2

(inch)

	Designation	ØD	Ød	Ød1	ℓ	L	M	Fig.
MATA	**M08-315-S063S-C**	0.571	5/8	0.335	3.150	5.906	M08	1
	M08-433-S063S-C	0.571	5/8	0.335	4.331	7.087	M08	1
	M08-590-S063S-C	0.571	5/8	0.335	5.906	9.843	M08	1
	M08-394-S063S-C-590	0.571	5/8	0.335	0.394	5.906	M08	2
	M08-394-S063S-C-708	0.571	5/8	0.335	0.394	7.087	M08	2
	M08-394-S063S-C-984	0.571	5/8	0.335	0.394	9.843	M08	2
	M10-354-S075S-C	0.689	3/4	0.413	3.543	6.693	M10	1
	M10-433-S075S-C	0.689	3/4	0.413	4.331	7.874	M10	1
	M10-689-S075S-C	0.689	3/4	0.413	6.890	11.811	M10	1
	M10-394-S075S-C-669	0.689	3/4	0.413	0.394	6.693	M10	2
	M10-394-S075S-C-787	0.689	3/4	0.413	0.394	7.874	M10	2
	M10-394-S075S-C-1181	0.689	3/4	0.413	0.394	11.811	M10	2
	M12-354-S100S-C	0.906	1	0.492	3.543	6.693	M12	1
	M12-433-S100S-C	0.906	1	0.492	4.331	7.874	M12	1
	M12-689-S100S-C	0.906	1	0.492	6.890	11.811	M12	1
	M12-059-S100S-C-669	0.906	1	0.492	0.591	6.693	M12	2
	M12-059-S100S-C-787	0.906	1	0.492	0.591	7.874	M12	2
	M12-059-S100S-C-1181	0.906	1	0.492	0.591	11.811	M12	2
	M16-354-S125S-C	1.142	1 1/4	0.669	3.543	7.087	M16	1
	M16-472-S125S-C	1.142	1 1/4	0.669	4.824	8.268	M16	1
	M16-689-S125S-C	1.142	1 1/4	0.669	6.890	11.811	M16	1
	M16-078-S125S-C-708	1.142	1 1/4	0.669	0.787	7.087	M16	2
	M16-078-S125S-C-826	1.142	1 1/4	0.669	0.787	8.268	M16	2
	M16-078-S125S-C1181	1.142	1 1/4	0.669	0.787	11.811	M16	2

FMRMA type

E180, 181, 190

LBEA-MHD type

E222

PAMA type

E243

PAXMA type

E248

AMMA type

E140, 141, 142

RM4PMA type

E82

RM4ZMA type

E84

HRMMA type

E208

HRMDMA type

E202, 203

GBEMA type

E226

Applicable Modular **E33** (FMRM, LBE, PAM, AMM, RM4PM, RM4ZM, HRMM, PAXM)

Adjusting side cutter

Code System

P : Plane type

B : Boss type

A : Adjusting side cutter

Adjusting

Cutter type

For half side cutter, minimum width of the cutter will be written only.

Max. width of cutter

R	A	FC	B	A	500	055	071	–	R

Insert clamping way

R : Radial type (Using SDXT)

T : Tangential type (Using CNHQ)

Insert configuration

FC Full side cutter

HC Half side cutter

Inch type

Cutter Dia.

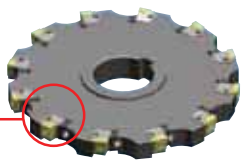
Min. width of cutter

Hand

Unmarked	R	L
Neutral	Right	Left
Full side cutter (Plane type)	Half side cutter (Boss type)	

Tangential Type (High rigidity)

CNHQ



- Medium/Roughing
- Excellent performance at medium to roughing range (0.551~1.181inch) table operation due to the strong rigidity of the cutter
- Good performance in heavy interruption and deep depth of cut application

Radial Type (Low cutting load)

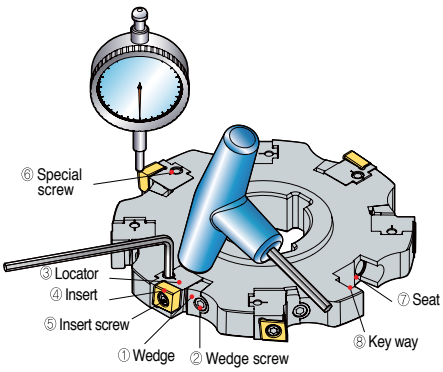
SDXT

- Medium/Finishing
- Suitable for small width cutting operation (0.472~0.945inch)
- 3 dimensional chip breaker provides smooth cutting operation.
- Several chip breakers as per applications are available (MF, MM, FA)
- Economical insert using 4 cutting edges per insert

Insert Features

- Precise adjustable side cutter can control the width of the cutter by 5㎛ unit
- Since the width of the cutter is adjustable up to ±0.06inch, single cutter can cover various cutting width
- Specially designed clamping system of the locator provides excellent rigidity by using elastic deformation of the locator
- Tangential type clamping system of insert provides enough strength can withstand large width cutting operations
- 3-dimensional chip breaker of insert provides smooth cutting with low cutting load at medium to finishing range

Operating manual



How to assemble the adjusting side cutter

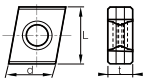
1. Clamp ①wedge slightly on ⑦locator-wedge pocket by using ②wedge screw
2. Put ③locator on ⑦locator-wedge pocket along with the ⑧key-way
3. Tighten the ⑥taper screw little bit to set proper position of locator
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. After put the ④insert on insert pocket of ③locator, clamp it with ⑤insert screw by using 40~50N.m torque

How to adjust Run-out & Cutting width

1. Settle the adjusting side cutter after cleaning to the jig for measurement
2. Un-screw the ②Wedge screw first, then tighten ①wedge slightly again by using 8N.m torque
3. Adjusting the height of cutting edge by using a dial gauge to set the width of the cutter
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. To finish the setting, tighten the ⑥taper screw for strong clamp

Tangential type

Cutting width as per insert & type of cutter

CNHQ  

(inch)

Designation		Coated		Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	L	d	t
		NCM325	PC6510					
CNHQ1005	- C0.5			0.354	0.551~0.709	0.394	0.394	0.213
	- R0.5							
	- C1.0			0.335	0.551~0.669			
	- R1.0							
CNHQ1305	- C0.5			0.472	0.709~0.827 / 0.827~0.945	0.500	0.394	0.213
	- R0.5							
	- C1.0			0.453	0.709~0.827 / 0.827~0.910			
	- R1.0							
	- C1.5			0.433	0.709~0.827 / 0.827~0.866			
	- R1.5							
CNHQ1606	- C0.5			0.591	0.945~1.063 / 1.063~1.181	0.630	0.472	0.252
	- R0.5							
	- C1.0			0.571	0.945~1.063 / 1.063~1.142			
	- R1.0							
	- C1.5			0.561	0.945~1.063 / 1.063~1.102			
	- R1.5							
	- C2.0			0.531	0.945~1.063			
	- R2.0							

Applicable holder **E285, E286** Available Arbors and bolt **E318~E320**

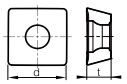
●Stock item

Recommended cutting condition

ISO	Grades	vc(sfm)	fz(ipt)
P	NCM325	490~990	0.004~0.012
	PC3500	330~990	
M	PC5300	330~590	0.004~0.012
	NCM335	400~660	
K	PC215K	490~820	0.004~0.012
	PC6510	490~990	

Radial type

Cutting width as per insert & type of cutter

MA  MF  MM  

(inch)

Designation		Coated							Uncoated	Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	d	t
		NCM325	NCM335	PC3500	PC3545	PC9530	PC6510	PC5300	H01				
SDXT	09M405R-MA								●	0.315	0.472~0.551 0.551~0.630	0.375	0.157
	09M405L-MA												
	09M405R-MF	●	●			●	●	●					
	09M405L-MF												
	09M405R-MM	●	●	●		●	●	●					
	09M405L-MM												
SDXT	130508R-MA								●	0.413	0.630~0.709 0.709~0.787 0.787~0.866 0.866~0.945	0.531	0.219
	130508L-MA												
	130508R-MF	●	●			●	●	●					
	130508L-MF												
	130508R-MM	●	●	●		●	●	●					
	130508L-MM												

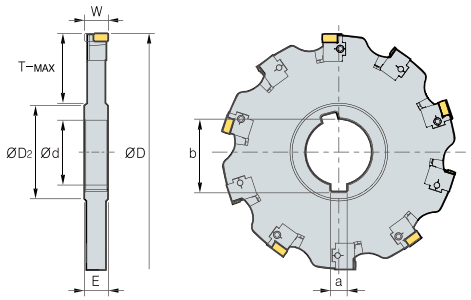
Applicable holder **E287, E288**

●Stock item

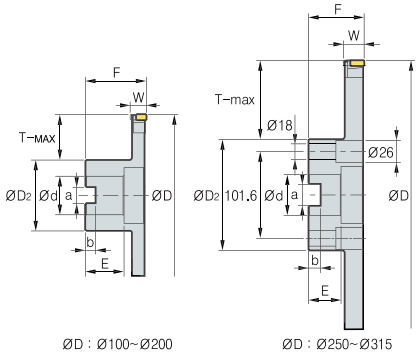
Recommended cutting condition

ISO	Grades	vc(sfm)	fz(ipt)
P	NCM325	400~820	0.003~0.013
	NCM335	400~730	0.003~0.010
	PC3500	330~730	0.004~0.010
M	PC9530	260~590	0.004~0.010
	PC5300		
K	PC8110	490~760	0.004~0.010
	PC6510	590~760	

Tangential type (Full side cutter)



• TAFCPA



• TAFCBA

(inch)

Designation	Ød	E	ØD2	a	b	T-MAX
TAFCPA 400-055-071	1 1/4	0.551	1.890	5/16	1.386	0.976
500-055-071	1 1/2	0.551	2.205	3/8	1.665	1.299
600-055-071	1 1/2	0.551	2.205	3/8	1.665	1.819
800-055-071	2	0.551	2.835	1/2	2.197	2.465
1000-055-071	2	0.551	2.835	1/2	2.197	3.465
1200-055-071	2	0.551	2.835	1/2	2.197	4.445
400-071-082	1 1/4	0.709	1.890	5/16	1.386	0.976
500-071-082	1 1/2	0.709	2.205	3/8	1.665	1.299
600-071-082	1 1/2	0.709	2.205	3/8	1.665	1.819
800-071-082	2	0.709	2.835	1/2	2.197	2.465
1000-071-082	2	0.709	2.835	1/2	2.197	3.465
1200-071-082	2	0.709	2.835	1/2	2.197	4.445
400-082-094	1 1/4	0.827	1.890	5/16	1.386	0.976
500-082-094	1 1/2	0.827	2.205	3/8	1.665	1.299
600-082-094	1 1/2	0.827	2.205	3/8	1.665	1.819
800-082-094	2	0.827	2.835	1/2	2.197	2.465
1000-082-094	2	0.827	2.835	1/2	2.197	3.465
1200-082-094	2	0.827	2.835	1/2	2.197	4.445
500-094-106	1 1/2	0.945	2.205	3/8	1.665	1.299
600-094-106	1 1/2	0.945	2.205	3/8	1.665	1.819
800-094-106	2	0.945	2.835	1/2	2.197	2.465
1000-094-106	2	0.945	2.835	1/2	2.197	3.465
1200-094-106	2	0.945	2.835	1/2	2.197	4.445
500-106-118	1 1/2	1.063	2.205	3/8	1.665	1.299
600-106-118	1 1/2	1.063	2.205	3/8	1.665	1.819
800-106-118	2	1.063	2.835	1/2	2.197	2.465
1000-106-118	2	1.063	2.835	1/2	2.197	3.465
1200-106-118	2	1.063	2.835	1/2	2.197	4.445

Designation	Ød	F	ØD2	a	b	E	T-MAX
TAFCBA 400-055-071R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
500-055-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
600-055-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
800-055-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
1000-055-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
1200-055-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
400-071-082R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
500-071-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
600-071-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
800-071-082R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
1000-071-082R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
1200-071-082R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
400-082-094R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
500-082-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
600-082-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
800-082-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
1000-082-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
1200-082-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
500-094-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
600-094-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
800-094-106R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
1000-094-106R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
1200-094-106R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
500-106-118R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
600-106-118R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
800-106-118R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
1000-106-118R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
1200-106-118R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Designation		
ØD	W	No. of tooth
4	0.551-0.708	6
5	0.551-0.708	8
6	0.551-0.708	10
8	0.551-0.708	12
10	0.551-0.708	16
12	0.551-0.708	20
4	0.708-0.826	6
5	0.708-0.826	8
6	0.708-0.826	10
8	0.708-0.826	12
10	0.708-0.826	16
12	0.708-0.826	20
4	0.826-0.944	6
5	0.826-0.944	8
6	0.826-0.944	10
8	0.826-0.944	12
10	0.826-0.944	16
12	0.826-0.944	20
5	0.944-1.062	8
6	0.944-1.062	10
8	0.944-1.062	12
10	0.944-1.062	16
12	0.944-1.062	20
5	1.062-1.181	8
6	1.062-1.181	10
8	1.062-1.181	12
10	1.062-1.181	16
12	1.062-1.181	20

Available Inserts and Recommended cutting condition **E255**

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.02 or R0.02

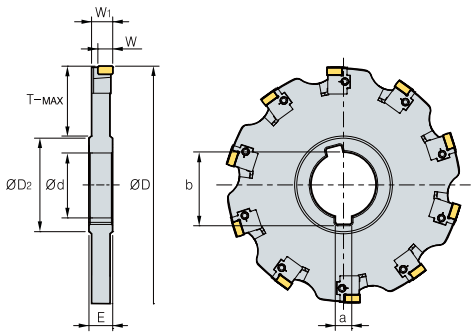
• ( )Metric Size

Parts

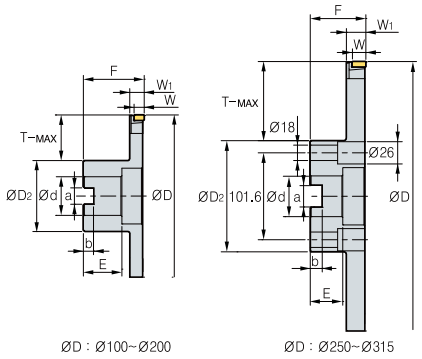
Specification Edge width(TAFCPA/BA)	Insert	Locator	Wedge	Insert Screw	Wedge Screw	Locator Screw	Insert Wrench	Wedge Wrench	Locator Wrench
□□□055-071R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□071-082R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□082-094R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□094-1067R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□106-118R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 1001821, 1002124 cutter is DHA0818F

Tangential type (Half side cutter)



• TAHCPA



• TAHCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
TAHCPA	400-055R/L	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055R/L	1 1/2	0.551	2.205	38/	1.665	1.819
	800-055R/L	2	0.551	2.835	1/2	2.197	2.465
	1000-055R/L	2	0.551	2.835	1/2	2.197	3.465
	1200-055R/L	2	0.551	2.835	1/2	2.197	4.445
	400-071R/L	1 1/4	0.709	1.890	5/16	1.386	0.976
	500-071R/L	1 1/2	0.709	2.205	3/8	1.665	1.299
	600-071R/L	1 1/2	0.709	2.205	38/	1.665	1.819
	800-071R/L	2	0.709	2.835	1/2	2.197	2.465
	1000-071R/L	2	0.709	2.835	1/2	2.197	3.465
	1200-071R/L	2	0.709	2.835	1/2	2.197	4.445
	400-082R/L	1 1/4	0.827	1.890	5/16	1.386	0.976
	500-082R/L	1 1/2	0.827	2.205	3/8	1.665	1.299
	600-082R/L	1 1/2	0.827	2.205	38/	1.665	1.819
	800-082R/L	2	0.827	2.835	1/2	2.197	2.465
	1000-082R/L	2	0.827	2.835	1/2	2.197	3.465
	1200-082R/L	2	0.827	2.835	1/2	2.197	4.445
	500-094R/L	1 1/2	0.945	2.205	3/8	1.665	1.299
	600-094R/L	1 1/2	0.945	2.205	38/	1.665	1.819
	800-094R/L	2	0.945	2.835	1/2	2.197	2.465
	1000-094R/L	2	0.945	2.835	1/2	2.197	3.465
	1200-094R/L	2	0.945	2.835	1/2	2.197	4.445
	500-106R/L	1 1/2	1.063	2.205	3/8	1.665	1.299
	600-106R/L	1 1/2	1.063	2.205	38/	1.665	1.819
	800-106R/L	2	1.063	2.835	1/2	2.197	2.465
	1000-106R/L	2	1.063	2.835	1/2	2.197	3.465
	1200-106R/L	2	1.063	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
TAHCBA	400-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-071R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-082R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-082R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-082R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-082R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-106R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-106R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-106R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions			
ØD	W	W1	No. of tooth
4	0.354	0.522	6
5	0.354	0.522	8
6	0.354	0.522	10
8	0.354	0.522	12
10	0.354	0.522	16
12	0.354	0.522	20
4	0.472	0.659	6
5	0.472	0.659	8
6	0.472	0.659	10
8	0.472	0.659	12
10	0.472	0.659	16
12	0.472	0.659	20
4	0.472	0.778	6
5	0.472	0.778	8
6	0.472	0.778	10
8	0.472	0.778	12
10	0.472	0.778	16
12	0.472	0.778	20
5	0.591	0.896	8
6	0.591	0.896	10
8	0.591	0.896	12
10	0.591	0.896	16
12	0.591	0.896	20
5	0.591	1.014	8
6	0.591	1.014	10
8	0.591	1.014	12
10	0.591	1.014	16
12	0.591	1.014	20

Available Inserts and Recommended cutting condition **E255**

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.02 or R0.02

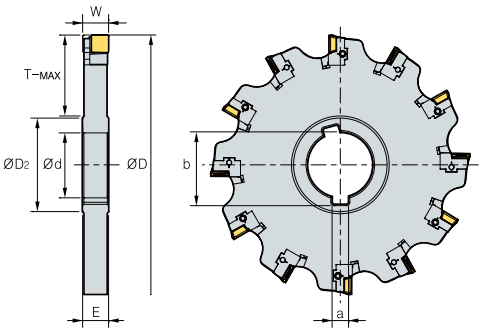
• ( )Metric Size

Parts

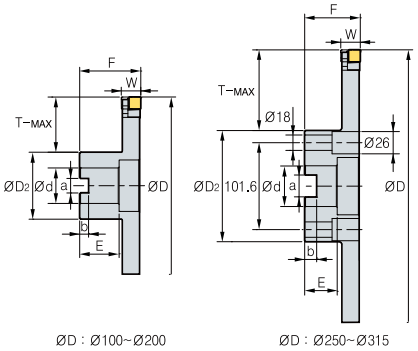
Specification Edge width(TAHCP/B)	Insert	Locator	Wedge	Insert Screw	Wedge Screw	Locator Screw	Insert Wrench	Wedge Wrench	Locator Wrench
□□□055R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□071R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□082R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□094R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□106R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 10018, 10021 cutter is DHA0818F

Radial type (Full side cutter)



• RAFCPA



• RAFCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
RAFCPA	400-047-055	1 1/4	0.472	1.890	5/16	1.386	0.976
	500-047-055	1 1/2	0.472	2.205	3/8	1.665	1.299
	600-047-055	1 1/2	0.472	2.205	3/8	1.665	1.819
	800-047-055	2	0.472	2.835	1/2	2.197	2.465
	1000-047-055	2	0.472	2.835	1/2	2.197	3.465
	1200-047-055	2	0.472	2.835	1/2	2.197	4.445
	400-055-063	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055-063	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055-063	1 1/2	0.551	2.205	3/8	1.665	1.819
	800-055-063	2	0.551	2.835	1/2	2.197	2.465
	1000-055-063	2	0.551	2.835	1/2	2.197	3.465
	1200-055-063	2	0.551	2.835	1/2	2.197	4.445
	500-063-071	1 1/2	0.629	2.205	3/8	1.665	1.299
	600-063-071	1 1/2	0.629	2.205	3/8	1.665	1.819
	800-063-071	2	0.629	2.835	1/2	2.197	2.465
	1000-063-071	2	0.629	2.835	1/2	2.197	3.465
	1200-063-071	2	0.629	2.835	1/2	2.197	4.445
	500-071-079	1 1/2	0.708	2.205	3/8	1.665	1.299
	600-071-079	1 1/2	0.708	2.205	3/8	1.665	1.819
	800-071-079	2	0.708	2.835	1/2	2.197	2.465
	1000-071-079	2	0.708	2.835	1/2	2.197	3.465
	1200-071-079	2	0.708	2.835	1/2	2.197	4.445
	500-079-086	1 1/2	0.787	2.205	3/8	1.665	1.299
	600-079-086	1 1/2	0.787	2.205	3/8	1.665	1.819
	800-079-086	2	0.787	2.835	1/2	2.197	2.465
	1000-079-086	2	0.787	2.835	1/2	2.197	3.465
	1200-079-086	2	0.787	2.835	1/2	2.197	4.445
	500-086-094	1 1/2	0.866	2.205	3/8	1.665	1.299
	600-089-094	1 1/2	0.866	2.205	3/8	1.665	1.819
	800-089-094	2	0.866	2.835	1/2	2.197	2.465
	1000-089-094	2	0.866	2.835	1/2	2.197	3.465
	1200-089-094	2	0.866	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
RAFCBA	400-047-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-047-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-047-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-047-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-047-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-047-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-055-063R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-055-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055-063R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055-063R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055-063R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-063-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-063-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-063-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-063-071R	2.5	2.559	5.118	1	0.551	1.496	2.362
	L1200-063-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-071-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071-079R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071-079R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071-079R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-079-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-079-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-079-086R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-079-086R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-079-086R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-086-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-089-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-089-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-089-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-089-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions		
ØD	W	No. of tooth
4	0.472-0.551	6
5	0.472-0.551	8
6	0.472-0.551	10
8	0.472-0.551	12
10	0.472-0.551	16
12	0.472-0.551	20
4	0.551-0.629	6
5	0.551-0.629	8
6	0.551-0.629	10
8	0.551-0.629	12
10	0.551-0.629	16
12	0.551-0.629	20
5	0.629-0.708	8
6	0.629-0.708	10
8	0.629-0.708	12
10	0.629-0.708	16
12	0.629-0.708	20
5	0.708-0.787	8
6	0.708-0.787	10
8	0.708-0.787	12
10	0.708-0.787	16
12	0.708-0.787	20
5	0.787-0.866	8
6	0.787-0.866	10
8	0.787-0.866	12
10	0.787-0.866	16
12	0.787-0.866	20
5	0.866-0.944	8
6	0.866-0.944	10
8	0.866-0.944	12
10	0.866-0.944	16
12	0.866-0.944	20

Available Inserts and Recommended cutting condition **E255**

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.02 or R0.02

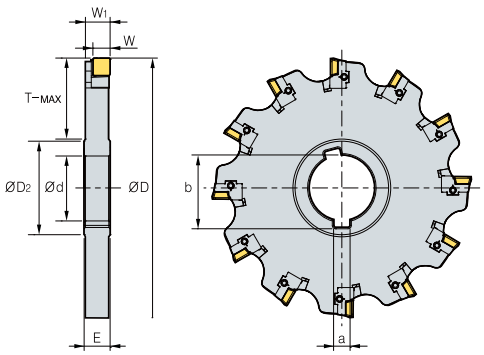
• ( )Metric Size

Parts

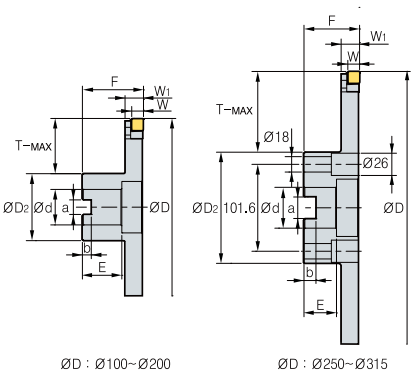
Specification Edge width(TAFCP/B)	Insert	Locator	Wedge (WSD09N / WSA10N)	Insert Screw	Wedge Screw	Locator Screw	Insert Wrench	Wedge, Locator Wrench
□□□047-055R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□055-063R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□063-071R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□071-079R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□079-086R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□086-094R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

Note) The Wedge screw for 400-071, 400-082 cutter is DHA0818F

Radial type (Half side cutter)



• RAHCPA



ØD : Ø100~Ø200 ØD : Ø250~Ø315

• RAHCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
RAHCPA	400-047R/L	1 1/4	0.472	1.890	5/16	1.386	0.976
	500-047R/L	1 1/2	0.472	2.205	3/8	1.665	1.299
	600-047R/L	1 1/2	0.472	2.205	3/8	1.665	1.819
	800-047R/L	2	0.472	2.835	1/2	2.197	2.465
	1000-047R/L	2	0.472	2.835	1/2	2.197	3.465
	1200-047R/L	2	0.472	2.835	1/2	2.197	4.445
	400-055R/L	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.819
	800-055R/L	2	0.551	2.835	1/2	2.197	2.465
	1000-055R/L	2	0.551	2.835	1/2	2.197	3.465
	1200-055R/L	2	0.551	2.835	1/2	2.197	4.445
	500-063R/L	1 1/2	0.629	2.205	3/8	1.665	1.299
	600-063R/L	1 1/2	0.629	2.205	3/8	1.665	1.819
	800-063R/L	2	0.629	2.835	1/2	2.197	2.465
	1000-063R/L	2	0.629	2.835	1/2	2.197	3.465
	1200-063R/L	2	0.629	2.835	1/2	2.197	4.445
	500-071R/L	1 1/2	0.708	2.205	3/8	1.665	1.299
	600-071R/L	1 1/2	0.708	2.205	3/8	1.665	1.819
	800-071R/L	2	0.708	2.835	1/2	2.197	2.465
	1000-071R/L	2	0.708	2.835	1/2	2.197	3.465
	1200-071R/L	2	0.708	2.835	1/2	2.197	4.445
	500-079R/L	1 1/2	0.787	2.205	3/8	1.665	1.299
	600-079R/L	1 1/2	0.787	2.205	3/8	1.665	1.819
	800-079R/L	2	0.787	2.835	1/2	2.197	2.465
	1000-079R/L	2	0.787	2.835	1/2	2.197	3.465
	1200-079R/L	2	0.787	2.835	1/2	2.197	4.445
	500-086R/L	1 1/2	0.866	2.205	3/8	1.665	1.299
	600-086R/L	1 1/2	0.866	2.205	3/8	1.665	1.819
	800-086R/L	2	0.866	2.835	1/2	2.197	2.465
	1000-086R/L	2	0.866	2.835	1/2	2.197	3.465
	1200-086R/L	2	0.866	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
RAHCBA	400-047R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-047R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-047R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-047R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-047R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-047R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-063R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-063R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-063R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-079R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-079R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-079R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-086R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-086R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-086R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions			
ØD	W	W1	No. of tooth
4	0.315	0.437	6
5	0.315	0.437	8
6	0.315	0.437	10
8	0.315	0.437	12
10	0.315	0.437	16
12	0.315	0.437	20
4	0.315	0.516	6
5	0.315	0.516	8
6	0.315	0.516	10
8	0.315	0.516	12
10	0.315	0.516	16
12	0.315	0.516	20
5	0.413	0.591	8
6	0.413	0.591	10
8	0.413	0.591	12
10	0.413	0.591	16
12	0.413	0.591	20
5	0.413	0.669	8
6	0.413	0.669	10
8	0.413	0.669	12
10	0.413	0.669	16
12	0.413	0.669	20
5	0.413	0.748	8
6	0.413	0.748	10
8	0.413	0.748	12
10	0.413	0.748	16
12	0.413	0.748	20
5	0.413	0.827	8
6	0.413	0.827	10
8	0.413	0.827	12
10	0.413	0.827	16
12	0.413	0.827	20

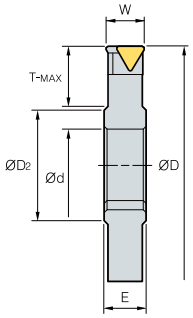
Available Inserts and Recommended cutting condition **E255**

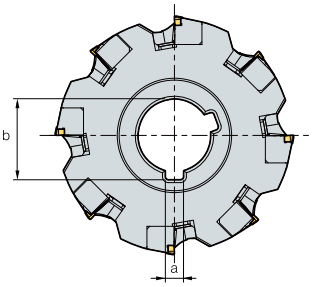
• The ap (Maximum width of cutter) size written above is the number when using insert having corner size R0.02. The ap is subject to change as per insert corner size
• The ap (Maximum width of cutter) size written above is the number when using SDXT09M405R-MM. The ap is subject to change as per insert corner size
• ( )Metric Size

Parts

Specification Edge width(TAHCP/B)	Insert	Locator	Wedge	Insert Screw	Wedge Screw	Locator Screw	Insert Wrench	Wedge, Locator Wrench
			WSD09N / WSA10N					
□□□047R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□055R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□063R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□071R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□079R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□086R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

FCA (Full side cutter)





- AR : 5°
- RR : 0°

(inch)

Designation		⌀	ØD	W	T-MAX	Ød	E	a	b	ØD2	Insert
FCA	**30375**	6	3.0	0.375	0.669	1	0.437	0.250	1.104	1.634	TPCN22PPN
	40437	8	4.0	0.437	0.945	1 1/4	0.500	0.313	1.385	1.889	TPCN22PPN
	50437	10	5.0	0.437	1.240	1 1/2	0.500	0.375	1.666	2.283	TPCN22PPN
	50750	8	5.0	0.750	1.240	1 1/2	0.875	0.375	1.666	2.283	TPCN22PPN
	60437	12	6.0	0.437	1.929	1 1/2	0.500	0.375	1.666	2.283	TPCN22PPN
	60625	12	6.0	0.625	1.929	1 1/2	0.750	0.375	1.666	2.283	TPCN22PPN
	60687	10	6.0	0.687	1.929	1 1/2	0.750	0.375	1.666	2.283	TPCN32PPN
	60750	10	6.0	0.750	1.929	1 1/2	0.875	0.375	1.666	2.283	TPCN32PPN
	80875	12	8.0	0.875	2.402	2	0.937	0.500	2.198	2.835	TPCN32PPN
	100937	16	10.0	0.937	3.189	2	1.000	0.500	2.198	3.307	TPCN32PPN
	120937	16	12.0	0.937	4.469	2	1.000	0.500	2.198	3.307	TPCN32PPN

Available Inserts

TPCN

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TPCN	**22PPN**		●										●	●		E21
	32PPN		●	●						●				●		

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	490~820 400~660 330~490	0.004~0.010 0.004~0.012 0.004~0.012	**NCM325** **PC3500** **ST30A**
M	260~590 260~490	0.004~0.010 0.004~0.012	**PC9530** **ST30A**
K	430~660 330~490	0.004~0.014 0.004~0.016	**PC6510** **G10**

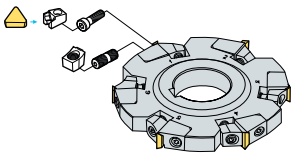
Parts

Locator	Wedge	Screw	Locator Screw	Wrench
LFC2R/L· LFC3R/L	WFC2N · WFC3N	DHA0617	MHB0310	HW30L
LFC2R/L-1*	WFC2N-1*	DHA0815	MHB0410	HW40L

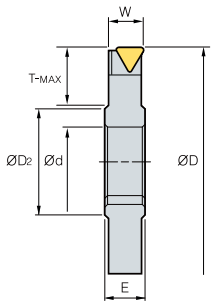
Available Inserts **E21**

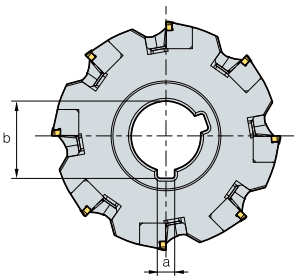
* FCST30A375

Assembling



HCA (Half side cutter)





• AR : 5°
• RR : 0°

(inch)

Designation			ØD	W	T-MAX	Ød	E	a	b	ØD2	Insert
HCA	**040945**	6	4.000	0.945	1 1/4	0.312	1.385	1.063	0.945	1.889	TPCN32PPN
	050945	8	5.000	1.240	1 1/2	0.375	1.666	1.063	0.945	2.283	TPCN32PPN
	060945	10	6.000	1.929	1 1/2	0.375	1.666	1.063	0.945	2.283	TPCN32PPN
	070945	12	7.000	2.441	2	0.500	2.198	1.063	0.945	2.834	TPCN32PPN
	100945	16	10.000	3.189	2	0.500	2.198	1.063	0.945	3.307	TPCN32PPN
	120945	20	12.000	4.469	2	0.500	2.198	1.063	0.945	3.307	TPCN32PPN

Available Inserts

TPCN

Designation		Cermet		Coated									Uncoated			Page
		CN2000	CN30	NCM325	NCM335	NC5330	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TPCN	**32PPN**		●	●							●				●		E21

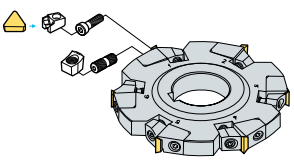
Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	490~820	0.004~0.010	**NCM325**
	400~660	0.004~0.012	**PC3500**
	330~490	0.004~0.012	**ST30A**
M	260~590	0.004~0.012	**PC9530**
	260~490	0.004~0.012	**ST30A**
K	430~660	0.004~0.014	**PC6510**
	330~490	0.004~0.016	**G10**

Parts

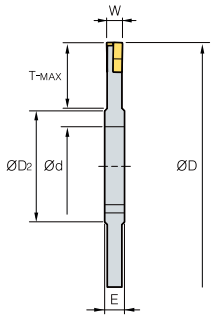
Specification	Locator	Wedge	Screw	Locator Screw	Wrench
Ø4.000~Ø12.000	LFC3R/L	WFC3N	DHA0815	MHB0410	HW40L

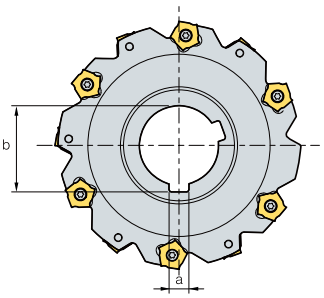
Assembling



Available Inserts E21

SPPA





• AR : -2°
• RR : -28°

(inch)

Designation		⊙	ØD	W	T-MAX	Ød	a	b	E	ØD2	Insert	Screw	Wrench
SPPA	**300-187**	8	3.0	0.187	0.686	1	0.250	1.104	0.312	1.575	PNEJ1223N	PTMA0403F	TW15S
	300-218	8	3.0	0.218	0.702	1	0.250	1.104	0.312	1.575	PNEJ1230N	PTMA0404F	TW15S
	300-250	8	3.0	0.250	0.718	1	0.250	1.104	0.312	1.575	PNEJ1235N	PTMA0405F	TW15S
	400-187	10	4.0	0.187	0.938	1 1/4	0.313	1.385	0.312	1.850	PNEJ1223N	PTMA0403F	TW15S
	400-218	10	4.0	0.218	0.953	1 1/4	0.313	1.385	0.312	1.850	PNEJ1230N	PTMA0404F	TW15S
	400-250	10	4.0	0.250	0.969	1 1/4	0.313	1.385	0.312	1.850	PNEJ1235N	PTMA0405F	TW15S
	400-312	10	4.0	0.312	1.000	1 1/4	0.313	1.385	0.312	1.850	PNEJ1245N	PTKA0407F	TW15S
	400-375	10	4.0	0.375	0.938	1 1/4	0.313	1.385	0.500	1.850	PNEJ1250N	PTKA0408F	TW15S
	400-437	10	4.0	0.437	0.969	1 1/4	0.313	1.385	0.500	1.850	PNEJ1255N	PTKA0409F	TW15S
	500-187	12	5.0	0.187	1.188	1 1/2	0.375	1.666	0.312	2.205	PNEJ1223N	PTMA0403F	TW15S
	500-218	12	5.0	0.218	1.203	1 1/2	0.375	1.666	0.312	2.205	PNEJ1230N	PTMA0404F	TW15S
	500-250	12	5.0	0.250	1.219	1 1/2	0.375	1.666	0.312	2.205	PNEJ1235N	PTMA0405F	TW15S
	500-312	12	5.0	0.312	1.250	1 1/2	0.375	1.666	0.312	2.205	PNEJ1245N	PTKA0407F	TW15S
	500-375	12	5.0	0.375	1.188	1 1/2	0.375	1.666	0.500	2.205	PNEJ1250N	PTKA0408F	TW15S
	500-437	12	5.0	0.437	1.219	1 1/2	0.375	1.666	0.500	2.205	PNEJ1255N	PTKA0409F	TW15S
	600-187	16	6.0	0.187	1.688	1 1/2	0.375	1.666	0.312	2.598	PNEJ1223N	PTMA0403F	TW15S
	600-218	16	6.0	0.218	1.703	1 1/2	0.375	1.666	0.312	2.598	PNEJ1230N	PTMA0404F	TW15S
	600-250	16	6.0	0.250	1.719	1 1/2	0.375	1.666	0.312	2.598	PNEJ1235N	PTMA0405F	TW15S
	600-312	16	6.0	0.312	1.750	1 1/2	0.375	1.666	0.312	2.598	PNEJ1245N	PTKA0407F	TW15S
	600-375	16	6.0	0.375	1.688	1 1/2	0.375	1.666	0.500	2.598	PNEJ1250N	PTKA0408F	TW15S
	600-437	16	6.0	0.437	1.719	1 1/2	0.375	1.666	0.500	2.598	PNEJ1255N	PTKA0409F	TW15S
	600-500	16	6.0	0.500	1.750	1 1/2	0.375	1.666	0.500	2.598	PNEJ1265N	PTKA0411F	TW15S
	600-562	16	6.0	0.562	1.719	1 1/2	0.375	1.666	0.625	2.598	PNEJ1275N	PTKA0413F	TW15S
	800-250	18	8.0	0.250	2.385	2	0.500	2.198	0.312	2.756	PNEJ1235N	PTMA0405F	TW15S
	800-312	18	8.0	0.312	2.416	2	0.500	2.198	0.312	2.756	PNEJ1245N	PTKA0407F	TW15S
	800-375	18	8.0	0.375	2.353	2	0.500	2.198	0.500	2.756	PNEJ1250N	PTKA0408F	TW15S
	800-437	18	8.0	0.437	2.384	2	0.500	2.198	0.500	2.756	PNEJ1255N	PTKA0409F	TW15S
	800-500	18	8.0	0.500	2.416	2	0.500	2.198	0.500	2.756	PNEJ1265N	PTKA0411F	TW15S
	800-562	18	8.0	0.562	2.384	2	0.500	2.198	0.625	2.756	PNEJ1275N	PTKA0413F	TW15S

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	490~820	0.004~0.010	**NCM325**
	400~660	0.004~0.012	**PC3500**
	330~490	0.004~0.012	**ST30A**
M	260~590	0.004~0.012	**PC9530**
	260~490	0.004~0.012	**ST30A**
K	430~660	0.004~0.014	**PC6510**
	330~490	0.004~0.016	**G10**

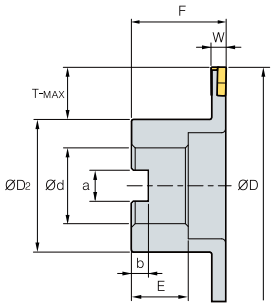
Code system

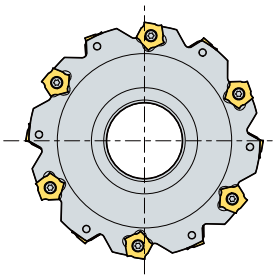
S P P A 160 - 06 R

- S — Cutter use(S - Side cutter)
- P — Insert Shape(P - Pentagonal Insert)
- P — Cutter type(P - Plane type, B - Boss type)
- A — Arbor type
- 160 — Cutter diameter(ØD)
- 06 — Width of cut(W)
- R — Hand of tool(R/L)

Available Inserts **E12**

SPBA





• AR : -2°
• RR : 28°

(inch)

Designation		⊙	ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
SPBA	**300-187R/L**	8	3.0	0.187	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1223N	PTMA0403F	TW15S
	300-218R/L	8	3.0	0.218	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1230N	PTMA0404F	TW15S
	300-250R/L	8	3.0	0.250	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1235N	PTMA0405F	TW15S
	400-187R/L	10	4.0	0.187	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1223N	PTMA0403F	TW15S
	400-218R/L	10	4.0	0.218	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1230N	PTMA0404F	TW15S
	400-250R/L	10	4.0	0.250	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1235N	PTMA0405F	TW15S
	400-312R/L	10	4.0	0.312	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1245N	PTMA0407F	TW15S
	400-437R/L	10	4.0	0.437	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1255N	PTMA0409F	TW15S
	500-250R/L	12	5.0	0.250	1.122	2.756	1 1/2	0.65	0.315	2.362	1.181	PNEJ1235N	PTMA0405F	TW15S
	500-312R/L	12	5.0	0.312	1.122	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1245N	PTKA0407F	TW15S
	500-375R/L	12	5.0	0.375	1.122	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1250N	PTKA0408F	TW15S
	600-187R/L	16	6.0	0.187	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1223N	PTMA0403F	TW15S
	600-250R/L	16	6.0	0.250	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1235N	PTMA0405F	TW15S
	600-375R/L	16	6.0	0.375	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1250N	PTKA0408F	TW15S
	600-437R/L	16	6.0	0.437	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1255N	PTKA0409F	TW15S
	600-500R/L	16	6.0	0.500	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1265N	PTKA0411F	TW15S
	600-562R/L	16	6.0	0.562	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1275N	PTKA0413F	TW15S
	800-250R/L	18	8.0	0.250	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1235N	PTMA0405F	TW15S
	800-437R/L	18	8.0	0.437	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1255N	PTKA0409F	TW15S
	800-500R/L	18	8.0	0.500	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1265N	PTKA0411F	TW15S

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	490~820 400~660 330~490	0.004~0.010 0.004~0.012 0.004~0.012	**NCM325** **PC3500** **ST30A**
M	260~590 260~490	0.004~0.010 0.004~0.012	**PC9530** **ST30A**
K	430~660 330~490	0.004~0.014 0.004~0.016	**PC6510** **G10**

Notice(When mounting inserts)

- Insert chip breaker should face chip pocket of the cutter
- Fasten screw after insert contacts securely on its seat
- If there is a gap between insert and its seat after mounting it may cause tool troubles

Available Inserts **E12**

SPSA

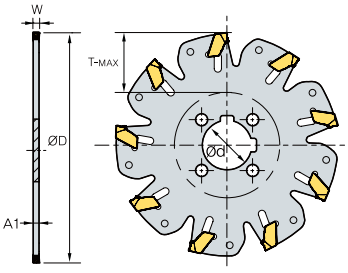


Fig. 1

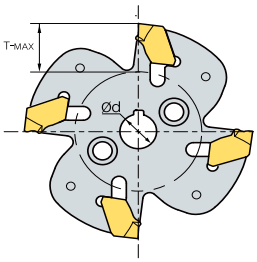


Fig. 2

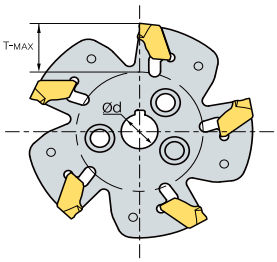


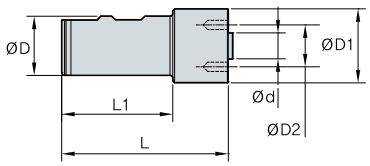
Fig. 3

(inch)

	Designation	⌀	ØD	W	T-MAX	Ød	A1	Fig.	Insert	Adaptor WS	Adaptor DF
SPSA	SPSA200-08704-0500R	4	2	0.087	0.449	0.5	0.071	2	SPFN 200-N	WS2528-M4	-
	SPSA250-08705-0500R	5	2.5		0.62	0.5		3		WS2532-M5	-
	SPSA300-08707-0875R/F	7	3		0.713 (0.594)	0.875		1		WS3240-M5	DF22-46
	SPSA400-08709-0875R/F	9	4		1.213 (1.094)	0.875		1		WS3240-M5	DF22-26
	SPSA500-08711-1250F	11	5		1.417	1.25		1		-	DF32-55
	SPSA600-08714-1250F	14	6		1.917	1.25		3		-	DF32-55
	SPSA250-11805-0500R	5	2.5	0.118	0.62	0.5	0.1	3	SPFN 300-N	WS2532-M5	-
	SPSA300-11807-0875R/F	7	3		0.713 (0.594)	0.875		1		WS3240-M5	-
	SPSA400-11809-0875R/F	9	4		1.213 (1.094)	0.875		1		WS3240-M5	DF22-46
	SPSA500-11811-1250F	11	5		1.417	1.25		1		-	DF22-26
	SPSA600-11814-1250F	14	6		1.917	1.25		1		-	DF32-55
	SPSA800-11818-1500F	18	8		2.425	1.5		1		-	DF32-55
	SPSA300-15706-0875R/F	6	3	0.157	0.713 (0.594)	0.875	0.134	1	SPFN 400-N	WS3240-M5	-
	SPSA400-15708-0875R/F	8	4		1.213 (1.094)	0.875		1		WS3240-M5	DF22-46
	SPSA500-15710-1250F	10	5		1.417	1.25		1		-	DF22-26
	SPSA600-15713-1250F	13	6		1.917	1.25		1		-	DF32-55
	SPSA800-15717-1500F	17	8		2.425	1.5		1		-	DF32-55

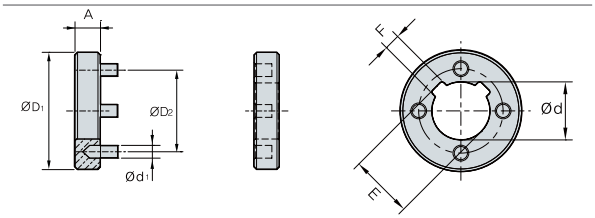
• Applicable wrench : SW17P (Separately sold) • T-max : ( )=> In use of DF adaptor

WSA ( )-( ) (Weldon Shank)



Designation	L	L1	D	D1	D2	d	Screw
WSA2528-M4	4.431	3.346	0.984	1.102	0.709	0.500	PTKA0408
WSA2532-M5	4.431	3.346	0.984	1.260	0.866	0.500	PTKA0515
WSA3240-M5	4.724	3.543	1.260	1.575	1.260	0.875	PTKA0515

DFA ( )-( ) (Drive Flange set)



Designation	D1	D2	d	d1	A	E	F
DFA22-46	1.811	1.260	0.875	0.197	0.394	0.948	0.125
DFA32-55	2.165	1.772	1.250	0.236	0.394	1.385	0.313
DFA40-80	3.150	2.480	1.500	0.433	0.472	1.666	0.375
DFA50-110	4.331	3.150	2.000	0.551	0.551	2.198	0.500

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
P	492(328~656) 394(262~558)	0.005~0.010 0.004~0.007	**PC3500** **PC3545**
M	525(394~656)	0.004~0.009	**PC5300**
K	361(230~492)	0.004~0.010	**PC215K**

Available Inserts **E20**

For slotting workpieces with corner radii of varying size and width

WIND MILL

New

- Optimal machining for slotting applications
- A unique recess design on the minor cutting edge reduces cutting load and improves tool life
- Special clamping system prevents incorrect clamping and fracture

Item description

• **Insert**

• **Cutter** WFSP(M) - Plane type

WFSB(M) - Boss type

Cutter Code system

W	FS	P(B)	A	300	–	156	R
Wind Mill	Insert arrangement	Cutter type	Inch type	ØD		Width of cut(W)	BOSS type(R/L)
	FS : Full side HS : Half side	P : Plane type B : Boss type					

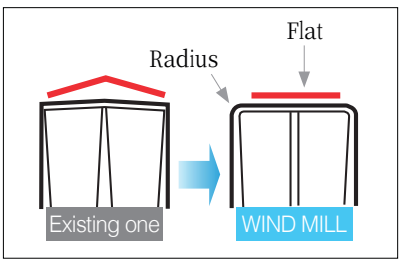
Insert Code system

S	N	H	T	12	045	08	R/L	–	WX
Insert shape	Relief angle of major cutting edge	tolerance	Shape of cross section	Ød	Height of cutting edge	Nose R	R/L		Chip breaker

Features

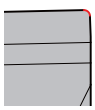
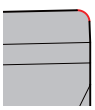
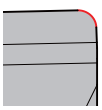
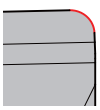
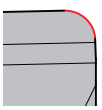
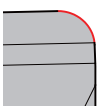
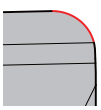
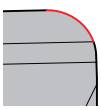
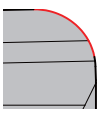
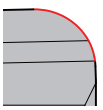
• Ideal geometry for superior surface roughness and extended tool life

• Perpendicular slot



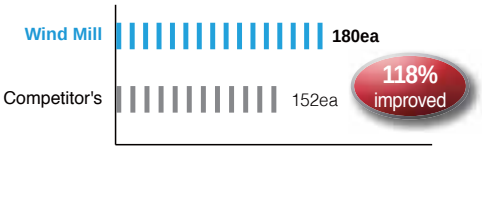
• Protruded part on tip seat prevents wrong clamping and fracture

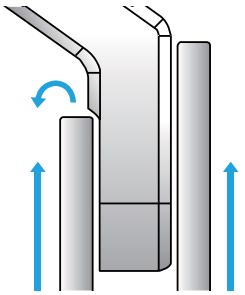
• Workpieces with corner radii of varying size and width (R0.008~R0.079)

R0.008	R0.016	R0.023	R0.031	R0.039	R0.047	R0.055	R0.063	R0.07	R0.079
									

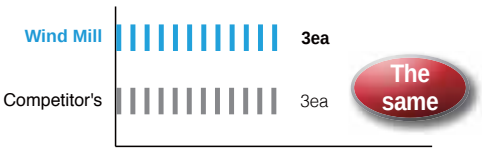
Application Example

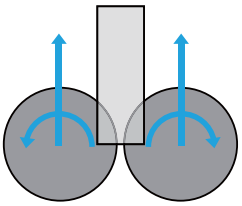
- **Workpiece** FCD500K (Carrier for Automobile)
- **Cutting conditions** vc(sfm) = 656
  fz(ipt) = 0.008
  vf(ipm) = 23.6
  ap(inch) = 0.08~0.12
- **Tool** KSF140R-T14-HM-2
  SNHT1205408R/L-WX (PC5300)





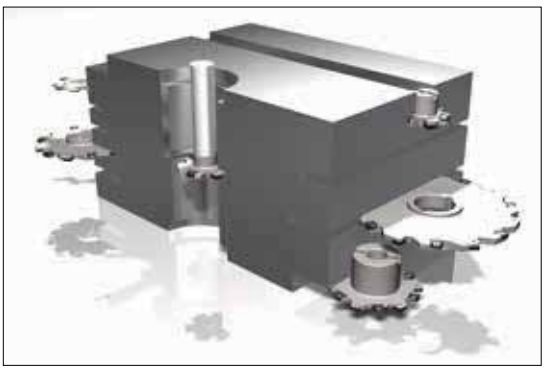
- **Workpiece** Mild steel (Lug for Vessel)
- **Cutting conditions** vc(sfm) = 1837
  fz(ipt) = 0.0035
  vf(ipm) = 29
  ap(inch) = 0.24
- **Tool** WFSP178R/L-T06
  SNHT1203508R/L-WX (PC5300)





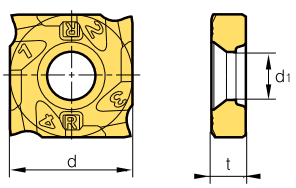
Recommended cutting condition

Workpiece	Cutting conditions		Grade
	vc(sfm)	fz (ipt)	
P	490~820	0.004~0.010	PC5300
M	390~655	0.004~0.012	PC5300
K	330~490	0.004~0.012	PC5300



List of inserts

Designation		Coated	Dimensions				Nose R	Configuration
		PC5300	Ød	Ød1	t	W		
SNHT	11023□□R/L-WX	●	0.433	0.157	0.090	0.157	0.008 ~ 0.063	
	1103□□R/L-WX	●	0.433	0.157	0.120	0.197	0.008 ~ 0.063	
	1203□□R/L-WX		0.500	0.197	0.130	0.217	0.008 ~ 0.079	
	12035□□R/L-WX	●	0.500	0.197	0.140	0.236	0.008 ~ 0.079	
	1204□□R/L-WX		0.500	0.197	0.160	0.276	0.008 ~ 0.079	
	12045□□R/L-WX	●	0.500	0.197	0.180	0.315	0.008 ~ 0.079	
	1205□R/L-WX		0.500	0.197	0.196	0.354	0.008 ~ 0.079	
	12054□R/L-WX	●	0.500	0.197	0.215	0.394	0.008 ~ 0.079	
	1206□□R/L-WX		0.500	0.197	0.236	0.433	0.008 ~ 0.079	
	12065□□R/L-WX		0.500	0.197	0.256	0.472	0.008 ~ 0.079	
	1207□□R/L-WX		0.500	0.197	0.276	0.512	0.008 ~ 0.079	
	12075□□R/L-WX		0.500	0.197	0.295	0.551	0.008 ~ 0.079	



• Inserts with various nose R sizes can be supplied in 2~3 weeks

WFSBA - Boss type

New

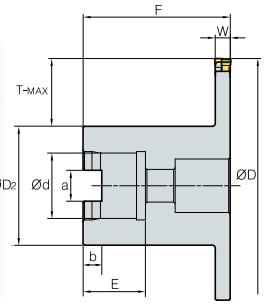


Fig. 1

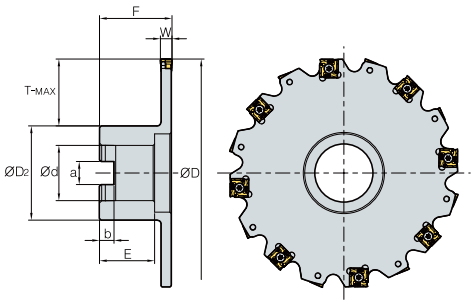


Fig. 2

- AR : -2°
- RR :-12°

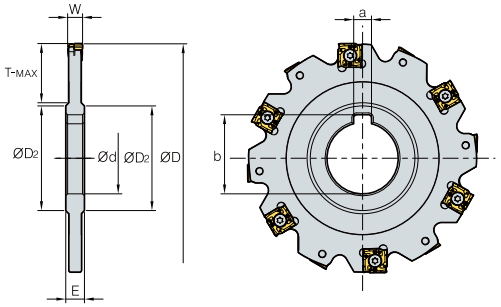
(inch)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
WFSBA	**300-156R/L**	8	3.0	0.156	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT11023R/L-WX	PTMA03503	TW09S
	300-187R/L	8	3.0	0.187	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT1103R/L-WX	PTMA03504	TW09S
	300-250R/L	8	3.0	0.250	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-156R/L	10	4.0	0.156	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT11023R/L-WX	PTMA03503	TW09S
	400-187R/L	10	4.0	0.187	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT1103R/L-WX	PTMA03504	TW09S
	400-250R/L	10	4.0	0.250	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-312R/L	10	4.0	0.312	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT12045R/L-WX	PTMA0406F	TW15S
	400-375R/L	10	4.0	0.375	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT1205R/L-WX	PTMA0408F	TW15S
	500-187R/L	12	5.0	0.187	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT1103R/L-WX	PTMA03504	TW09S
	500-250R/L	12	5.0	0.250	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT12035R/L-WX	PTMA0405F	TW15S
	500-312R/L	12	5.0	0.312	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT12045R/L-WX	PTMA0406F	TW15S
	500-375R/L	12	5.0	0.375	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-187R/L	16	6.0	0.187	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1103R/L-WX	PTMA03504	TW09S
	600-250R/L	16	6.0	0.250	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12035R/L-WX	PTMA0405F	TW15S
	600-312R/L	16	6.0	0.312	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12045R/L-WX	PTMA0406F	TW15S
	600-375R/L	16	6.0	0.375	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-500R/L	16	6.0	0.500	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1207R/L-WX	PTKA0411	TW15S
	800-250R/L	18	8.0	0.250	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12035R/L-WX	PTMA0405F	TW15S
	800-312R/L	18	8.0	0.312	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12045R/L-WX	PTMA0406F	TW15S
	800-375R/L	18	8.0	0.375	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1205R/L-WX	PTMA0408F	TW15S
	800-500R/L	18	8.0	0.500	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1207R/L-WX	PTKA0411	TW15S

Available Inserts **E18**

WFSPA - Plane type

New



- AR : -2°
- RR :-12°

(inch)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
WFSPA	**300-156**	8	3.0	0.156	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT11023R/L-WX	PTMA03503	TW09S
	300-187	8	3.0	0.187	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	300-250	8	3.0	0.250	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-156	10	4.0	0.156	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT11023R/L-WX	PTMA03503	TW09S
	400-187	10	4.0	0.187	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	400-250	10	4.0	0.250	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-312	10	4.0	0.312	1.125	1.75	1 1/4	0.312	1.385	1.50	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	400-375	10	4.0	0.375	1.125	1.75	1 1/4	0.312	1.385	1.50	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	500-187	12	5.0	0.187	1.565	1.87	1 1/4	0.312	1.666	1.75	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	500-250	12	5.0	0.250	1.565	1.87	1 1/4	0.312	1.666	1.75	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	500-312	12	5.0	0.312	1.565	1.87	1 1/4	0.312	1.666	1.75	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	500-375	12	5.0	0.375	1.565	1.87	1 1/4	0.312	1.666	1.75	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-187	16	6.0	0.187	1.875	2.25	1 1/2	0.375	1.666	2.00	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	600-250	16	6.0	0.250	1.875	2.25	1 1/2	0.375	1.666	2.00	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	600-312	16	6.0	0.312	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	600-375	16	6.0	0.375	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-500	16	6.0	0.500	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT1207R/L-WX	PTKA0411	TW15S
	800-250	18	8.0	0.250	2.625	2.75	1 1/2	0.375	2.198	2.00	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	800-312	18	8.0	0.312	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	800-375	18	8.0	0.375	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	800-500	18	8.0	0.500	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT1207R/L-WX	PTKA0411	TW15S

Available Inserts **E18**

High feed cutter with extra pitch for cast iron and light alloy steels

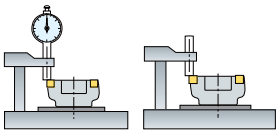
High feed Cutter

- High feed cutter employs extra pitch for cast iron and light alloy steels
- Quick change type for reduction of cutter change time
- Cutting edge chatter is controlled
- Quick change type for cutter size under ø6.0, 2piece types for cutter size over ø8.0

Guide of insert setting

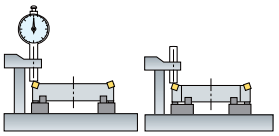
▶ Special equipment has to be used to get precise run out with high feed cutter.

Adaptor type



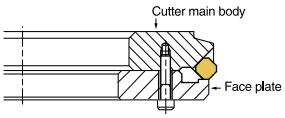
- Mainly under ø6.0 diameter is used in 1piece type
- Available for fixed size of cutter and assembling & checking can be done at the same time

Roller type



- Mainly over ø8.0 diameter is used in 2piece type
- Due to 3 adjustable guide roller, variety size of cutter can be assembled

Plate type



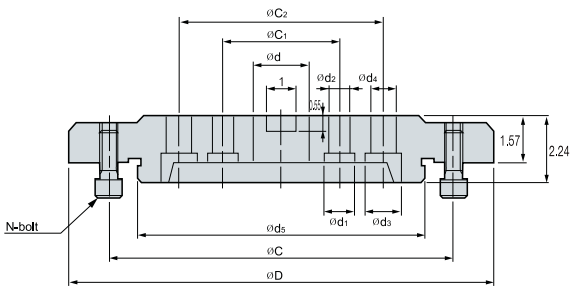
- Suitable for small size cutter due to the simple tructure
- It is unnecessary to unclamp the cutter from the machine, it's possible to reassemble the cutter as it mounted on the machine
- You should make plate by yourself

Guide of insert setting in adaptor/roller type

1. Clean the cutter and equipment
2. Pointer should be assembled with same height with cutter
3. Move to each insert on tip seat to end of pointer and tighten(torque 2N.m) wedge.
4. Exchange pointer to dial gauge
5. Measure the run-out totally
6. When a insert over run-out, loosen wedge and adjust run-out. (for roughing 10~20μ, for finishing 5~10μ)
7. Tighten(torque 7-8N.m) wedge
8. Measure the final run-out by dial gauge

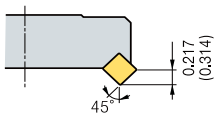
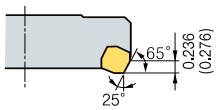
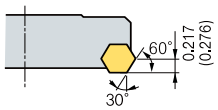
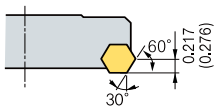
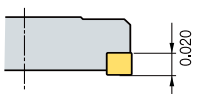
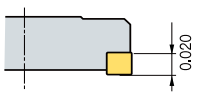
Notice) When you clamp wedge too tighten, run-out is getting worse to cutter distortion
When you clamp wedge, you should use torque wrench to set more precisely

Adaptor(Ø7.874-Ø17.717)



Designation		ØD	Ød	Ød1	Ød2	Ød3	Ød4	Ød5	ØC	ØC1	ØC2	N	Cutter
APR	**200**	7.087	2.5	1.204	0.709	-	-	3.150	4.724	4.0	-	4	ø7.874
	250	9.055	2.5	1.204	0.709	-	-	4.724	6.693	4.0	-	4	ø9.842
	315	11.614	2.5	1.204	0.709	1.26	0.827	7.087	9.055	4.0	7.0	6	ø12.402
	355	13.189	2.5	1.204	0.709	1.26	0.827	8.661	10.630	4.0	7.0	6	ø13.976
	400	14.567	2.5	1.204	0.709	1.26	0.827	9.843	11.811	4.0	7.0	8	ø15.748
	450	16.535	2.5	1.204	0.709	1.26	0.827	11.811	13.780	4.0	7.0	8	ø17.716

High feed cutters type and features

Designation	Cutter diameter	Workpiece, Application range	Min. surface roughness	Approach angle and Max. cutting depth is for 5000 type	Axial rake angle	Radial rake angle	Available insert
ANH4000 ANH5000	Ø4.0~Ø18.0	Cast iron Roughing	25Z		-5°	-6°	SNCN43ENN SNCN53ENN
CDH4000 CDH5000	Ø4.0~Ø18.0	Cast iron Roughing Finishing	18Z		+10°	+5°	SDCN42R SDCN53R
DEH5000	Ø4.0~Ø18.0	Al alloy Roughing	20Z		+14°	+6°	HECN532FN
DPH5000	Ø4.0~Ø18.0	Cast iron Roughing Finishing	12Z		+5°	-3°	HPEN532FN/SN/EN HPEN532-WC
PNH4000 PNH5000	Ø5.0~Ø18.0	Cast iron Finishing	12Z		-5°	-6°	SNEF435 SNEF535
PPH4000	Ø5.0~Ø18.0	Cast iron Finishing	12Z		+5°	-5°	SPEN434-WC

Recommended cutting condition

Workpiece	Cutting Condition		Grades	Remark
	vc(sfm)	fz(ipt)		
Cast iron	330~460	0.002~0.008	**PC6510**	PVD Coated
	260~490	0.002~0.008	**H01,G10**	Uncoated
Al alloy	1650~	0.002~0.008	**PC6510**	PVD Coated
	1650~	0.002~0.008	**H01,G10**	Uncoated

Excellent tool life acheived by the wide variety of grades to match work conditions

Storm Mill

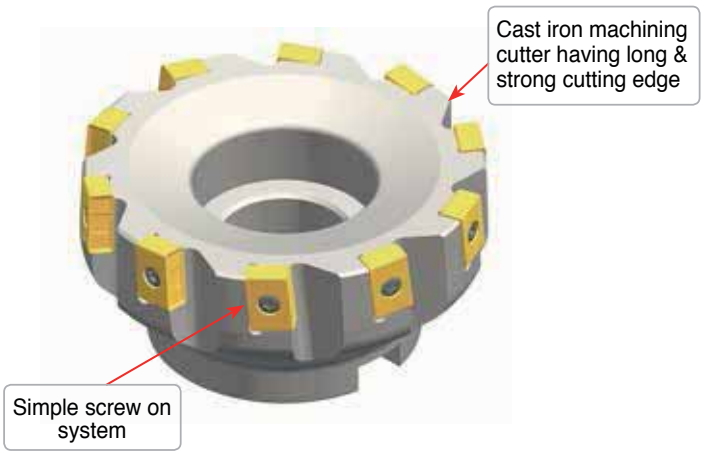
- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner avaiable with R/L type cutter)
- Effective on large depth of cut applications due to the long cutting edge
- Excellent tool life guaranteed by wide variety of grades to suit any working conditions
- 2 different types of inserts(chamfer / nose R) are available with 1 type of cutter

Code System

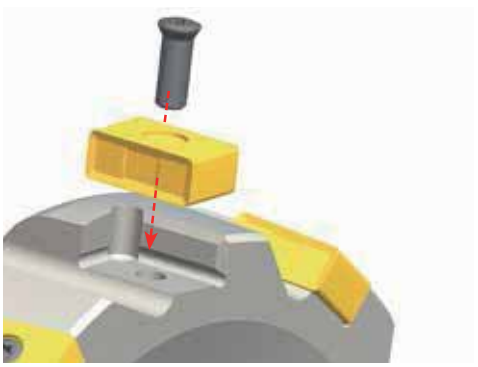
S	Q	N	A	3	300	R	(2)	–	28Z

Cutter	Approach angle	Relief angle of insert	Inch type	Insert	Cutter Dia.	Hand	Cutter shape	No. of tooth
S : Storm Mill	Q : 2˚ F : 5˚ A : 45˚ E : 15˚	N : Negative (0˚)		3 : 3/8inch 4 : 1/2inch	inch unit	R : Right L : Left	No code : Normal type 2 : Quick change type (2 pieces type)	

Cutter



Clamping of insert



Recommended cutting condition

Designation / Grades	Gray cast iron		Ductile cast iron	
	GC		GCD	
	vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)
PC3500	492~820	0.003~0.011	328~591	0.003~0.011
PC6510	492~984	0.004~0.011	328~656	0.004~0.011
PC3545	492~820	0.003~0.009	328~591	0.003~0.009
H01	328~656	0.003~0.009	230~459	0.003~0.009
G10	295~394	0.003~0.011	197~427	0.003~0.011

Optimal cutter for steel and cast iron machining with easily adjustable run-out

Shave Mill

- Adjustable Range (Adjustable range: 0.004inch, Adjustable allowance: within 2㎛)
- Wiper crown type 8-cornered insert reduces machining cost and realizes excellent surface roughness
- Grade with high toughness and wear resistance ensures long tool life
- The cBN grade achieves superior surface finish

Cutter Code System

SVM	A	4	250	R	Z6
Shave Mill	Inch Type	Inscribed Circle 4 : 0.5inch	Cutter Dia.(Ø) ISO : mm ASA : inch	Hand of tool R: right handed L: left handed	No. of tooth(Z)

Insert Code System

Carbide

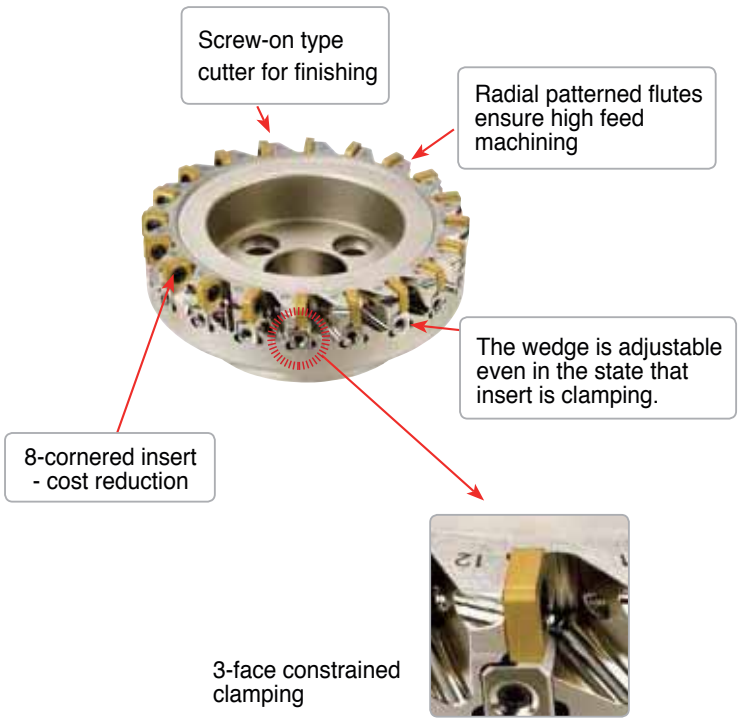
Nose R type	SNEU120420-MF
Chamfer type	SNEU1204ANN-MF
Low cutting type	SNEU1204-WMF

cBN

SNEU1204-TBW

T : Nagaland
B : cBN
W: Wiper

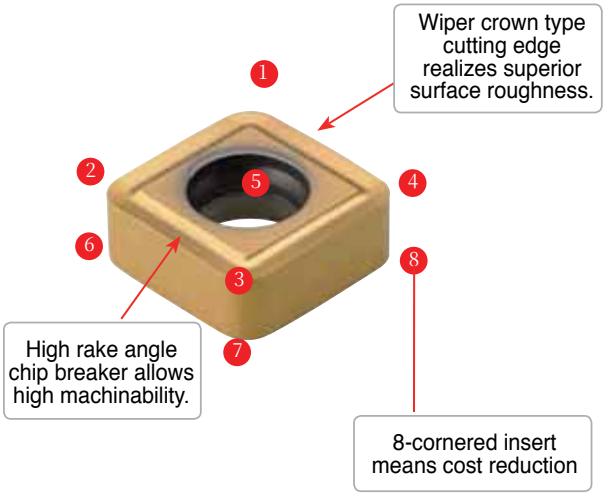
Features



Adjustment

- Adjustable range: 2.54inch
- Adjustability: below 2μ
- Operation: easy and simple

Features of insert



SNEU120420-MF	SNEU1204ANN-MF
	
Nose R type	Chamfer type
SNEU1204-WMF	**SNEU1204-TBW**
	
For low cutting load	Wiper for high speed machining

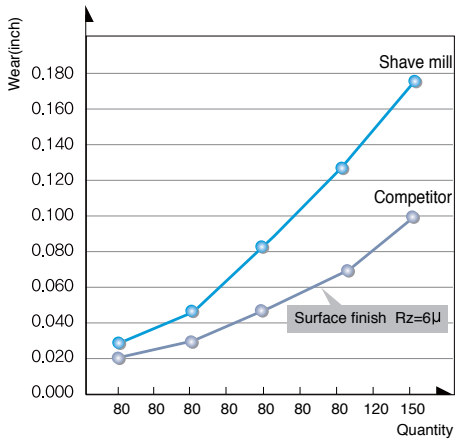
Recommended cutting condition

Workpiece	Cutting Condition			Grades
	vc(sfm)	fz(ipt)	ap(inch)	
P	492~1820	0.002 ~ 0.008	~ 0.02	**PC3500**
K	492~984 1968~3280	0.002 ~ 0.012 0.002 ~ 0.008	~ 0.02 ~ 0.02	**PC6510** **DBN920**

Application example 1

· Work piece : Cylinder head (facing)
· Cutting conditions : vc=656, fz=0.006, ap=0.02, Dry
· Tools : Shave Mill - SVMM4250R
Insert - PC6510 SNEU120420-MF

· Work piece : FC25(HB250) Cylinder head (facing)
· Cutting conditions : vc=2296, fz=0.004, ap=0.02, Dry
· Tools : Shave Mill - SVMM4160R
Insert - DBN920 SNEU1204-cBN



• Results

	Tool life	Surface finish	Machinability
Shave mill	250 pcs	Rz=3μ	High
Competitor	180 pcs	Rz=3.5μ	Normal

▸ Korloy's shave mills ensure twice the machinability, adjustability,and surface roughness than competitor's, along with twice the tool life.

Better tool life with special grade which has both toughness and wear resistance

Shave Mill Ultra

- Superior surface roughness for this Finishing cutter when applied to heavy work pieces
- Easy to handle and good rigidity with simple screw on system
- Superior surface finishes due to the wiper crown cutting edge
- Better tool life with special grade which has both toughness and wear resistance
- Two different types: economical normal type and adjustable run-out type 'B'

Code System of Cutter

SVU	A	6	300	R	Z6	-	B
Shave Mill Ultra	Inch Type	Inscribed Circle	Cutter Dia.(Ø)	Hand of tool	No. of tooth(Z)		Cutter Type
		6 : 0.75inch	ISO : mm ASA : inch	R : Right L : Left			None : Normal B : Adjustable

Code System of Insert

L	N	C	S	1	9	0	7	-	R3.0	-	WC
			Shave Mill Ultra						Corner Type C : Chamfer R : Round		Wiper Crown

Features

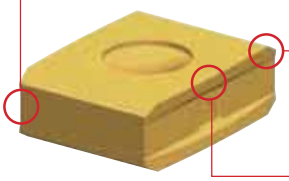
Normal type

Good rigidity and economical due to simple screw on type

Better surface roughness when you use only 1 insert but adjust the 'ap' under 0.001inch

Adjustable cutting edge(Type B)

Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts



Good cutting performance & chip flow due to positive rake angle chip breaker

Economical 4 corner use insert

Good surface roughness by wiper crown cutting edge design

Adjustable Range	· Range : 0.039inch · Allowance : Within 2μ

Recommended cutting condition

Workpiece	Cutting Condition			Tooth	Grades
	vc(sfm)	fz(ipt)	ap(inch)		
P	492~820	0.002~0.008	~0.024	Full use	PC3500
	492~820	0.079~0.197	~0.001	1use	
K	192~984	0.002~0.008	~0.024	Full use	PC6510
	192~984	0.079~0.197	~0.001	1use	

Special Korloy cutter for cast iron roughing

Cube Mill

- Special Korloy cutter for cast iron roughing
- 8 corner using insert (maximum 16 corner available with 2 cutter, R/L cutter)
- Excellent cutting performance with positive rake angle made by 3 dimensional chip breaker
- Excellent tool life by combination of the variety of grades and chip breakers to match most working conditions
- 2 different type of inserts(chamfer / nose R) are available with 1 type cutter

Roughing for cast iron

Code System

CBM	E	A	3	300	R	(2)	– 28Z
Cutter	AA	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	Cutter shape	No. of tooth(Z)
CBM : CUBE MILL	Q : 2˚ C : 25˚ F : 5˚ A : 45˚ E : 15˚		3 : 9.525 4 : 12.7	Ø300	R : Right L : Left	Unmarked : Normal type 2 : Quick change type (2 pieces type)	

Cube Mill and Cube Mill Couple are available by order made.

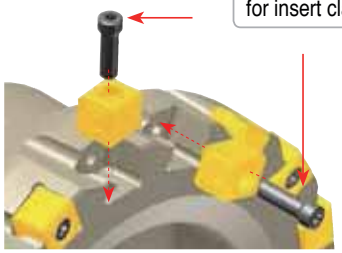
Insert (R/L type)

<Chamfer type>	<Nose R type>
	

Cutter body

	General	Quick change
Cutter diameter(Ø)	3.0 ~ 12.0 Inch	8.0 ~ 18.0 Inch
AA : 2°, 5°, 15°, 25°, 45°		

Cutter



Screw on clamping system

Parts

Cube mill 3000

Screw	Wrench
	
FTGA0417CBM	TW15 - 100
ETGA0520CBM	TW20 - 100

Ideal combination of Aluminum body with cast iron high feed cutter

Couple Mill

- Ideal combination of Aluminum body with cast iron high feed cutter
- Since the weight of the cutter has been reduced 50% of a steel cutter it is very easy to handle and very effective in preventing loading accidents
- Applicable for Cube Mill, Storm Mill

CUBE-COUPLE Code system

CBM E A 3 1400 R 28Z – CP

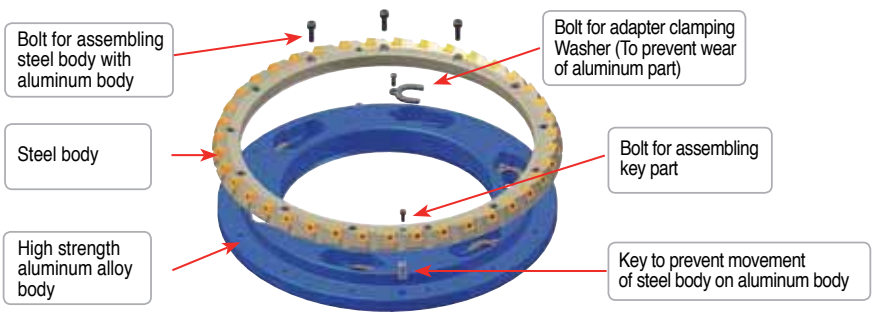
Cutter	AA	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	No. of tooth(Z)	Couple Mill
CBM : CUBE MILL	Q : 2˚ C : 25˚ F : 5˚ A : 45˚ E : 15˚		3 : 9.525 4 : 12.7	ISO : mm ASA : inch	R : Right L : Left	28Z : 28	

STORM-COUPLE Code system

S Q N A 3 1400 R 28Z – CP

Cutter	AA	Relief angle of insert	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	No. of tooth(Z)	Couple Mill
S : STORM MILL	Q : 2˚ E : 15˚ F : 5˚ A : 45˚	N : Negative(0°)		3 : 9.525 4 : 12.7	ISO : mm ASA : inch	R : Right L : Left	28Z : 28	

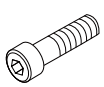
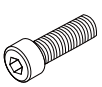
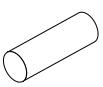
Assembling structure



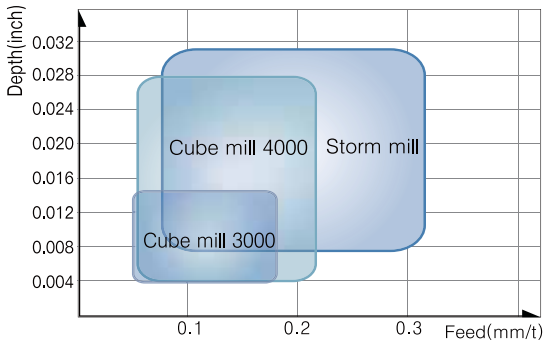
Cutter body

	Quick change
Cutter diameter(Ø)	14.0~18.0 Inch

Parts

	Screw	Wrench	Wrench	Bolt for body	Bolt for key	Key for body
						
CUBE-COUPLE 3000 Type	FTGA0417CBM	TW15-100	-	BHA0616	MHBO410	PN1019-DRV
4000 Type	ETGA0520CBM	TW20-100		BHA0620		
STORM-COUPLE 3000 Type	FTNA0513	-	TW15S	-	-	-

Application range of High feed Cutters for Cast iron



Recommended cutting condition

CUBE MILL		Gray cast iron		Ductile cast iron	
		vc(sfm)	fz(ipt)	vc(sfm)	fz(ipt)
PVD	PC6510	490~990	0.003~0.007	330~660	0.003~0.007
	PC215K	400~690	0.005~0.007	260~490	0.005~0.007
Uncoated	G10	300~400	0.005~0.007	200~430	0.005~0.007

ANHA4000

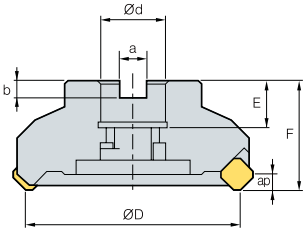


Fig. 1

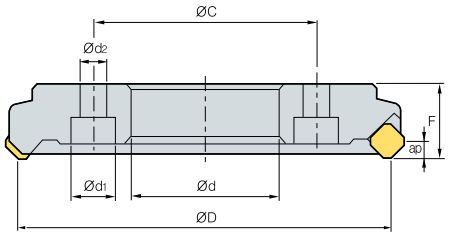


Fig. 2

AA 45°
- AR : 5°
- RR : -6°

(inch)

Designation		⚙	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
ANHA	**4400R/L**	8	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.216	5.50	1
	4500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.216	10.34	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.216	16.06	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.216	15.40	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.216	21.12	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.216	28.38	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.216	34.10	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.216	41.36	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.216	48.84	2

Available Inserts

SNCN

SNKN

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCN	**43ENN**															E17
SNKN	**43ENN**															E18

Recommended cutting condition

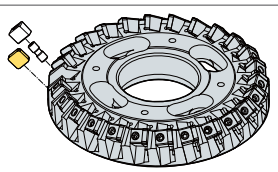
Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~ 0.012	**G10**

Parts

Specification	Wedge	Wedge Screw	Wrench
Ø4.0~Ø18.0	WANH4N	DHA0821F	HW40

Available Inserts **E17, E18**

Assembling	



ANHA5000

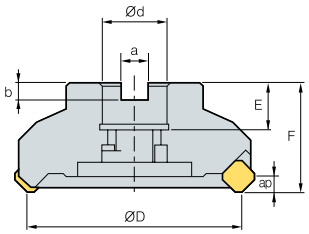


Fig. 1

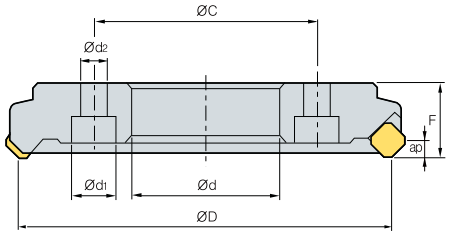


Fig. 2

AA 45°

- AR : 5°
- RR : -6°

(inch)

Designation		⊙	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
ANHA	5400R/L	8	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.315	5.72	1
	5500R/L	10	5.0	1.500	-	-	0.625	0.625	1.181	2.500	-	0.315	11.00	1
	5600R/L	14	6.0	2.000	-	-	0.750	0.750	1.181	2.500	-	0.315	16.50	1
	5800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.315	15.40	2
	51000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.315	21.12	2
	51200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.315	28.38	2
	51400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.315	34.10	2
	51600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.315	41.36	2
	51800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.315	48.84	2

Available Inserts

SNCN

SNKN

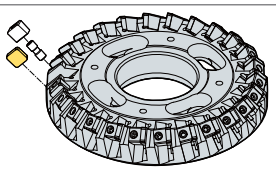
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCN	53ENN												●			E17
SNKN	53ENN			●												E18

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	PC6510
	260 ~ 490	0.004 ~ 0.012	H01
	260 ~ 490	0.004 ~ 0.012	G10

Parts

Specification	Wedge	Wedge Screw	Wrench
Ø4.0~Ø18.0	WANH5N	DHA0821F	HW40

Assembling	
	

Available Inserts E17, E18

CDHA4000

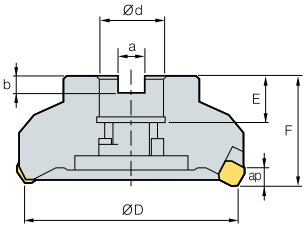


Fig. 1

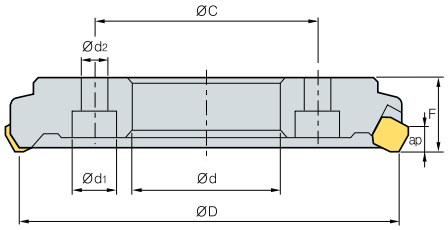


Fig. 2

AA 25°

- AR : 10°
- RR : 5°

(inch)

Designation			ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
CDHA	**4400R/L**	8	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.236	5.06	1
	4500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.236	9.68	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.236	14.96	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.236	14.74	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.236	20.02	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.236	27.06	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.236	32.56	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.236	39.82	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.236	46.86	2

Available Inserts

SDCN

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	**42R**															E13
	42L															

Recommended cutting condition

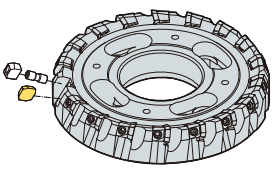
Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~ 0.012	**G10**

Parts

Specification	Wedge	Wedge Screw	Wrench
Ø4.0-Ø6.0	WCDH4R1L1	DHA0821F	HW40
Ø8.0-Ø18.0	WCDH4R/L		

Available Inserts **E13**

Assembling	



CDHA5000

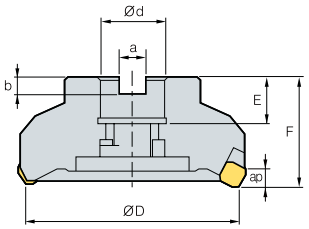


Fig. 1

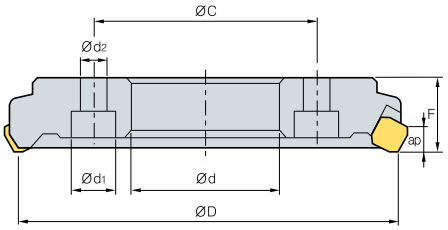


Fig. 2

AA 25°

- AR : 10°
- RR : 5°

(inch)

Designation		⦾	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
CDHA	**5400R/L**	08	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.275	5.06	1
	5500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.275	9.68	1
	5600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.275	14.96	1
	5800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.275	14.52	2
	51000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.275	20.02	2
	51200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.275	26.84	2
	51400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.275	32.34	2
	51600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.275	39.60	2
	51800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.275	46.64	2

Available Inserts

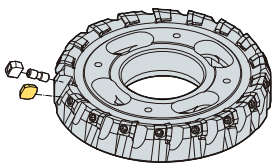
SDCN

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	**53R**															E13
	53L															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~0.012	**G10**

Assembling



Parts

Specification	Wedge	Wedge Screw	Wrench
Ø4.0-Ø6.0	WCDH5R1L1	DHA0821F	HW40
Ø8.0-Ø18.0	WCDH5R/L		

Available Inserts **E13**

DEHA5000

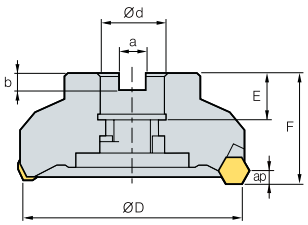


Fig. 1

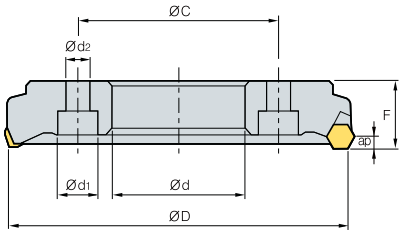


Fig. 2

AA 30°

- AR : 14°
- RR : 6°

(inch)

Designation			ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
DEHA	**5400R/L**	6	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.275	5.06	1
	5500R/L	7	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.275	9.68	1
	5600R/L	8	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.275	13.86	1
	5800R/L	12	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.275	14.30	2
	51000R/L	14	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.275	20.02	2
	51200R/L	18	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.275	26.62	2
	51400R/L	20	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.275	32.56	2
	51600R/L	24	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.275	39.16	2
	51800R/L	28	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.275	46.20	2

Available Inserts

HECN

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
HECN	**090408FN**															E07
	090408SN															
	090408TN															

Recommended cutting condition

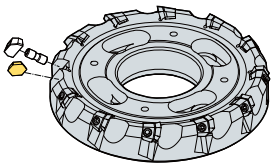
Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~ 0.012	**G10**

Parts

Specification	Wedge	Wedge Screw	Wrench
Ø4.0-Ø8.0	WDEHR-1/L-1	DHA0821F	HW40
Ø10.0-Ø18.0	WDEHR/L		

Available Inserts **E07**

Assembling	



DPHA5000

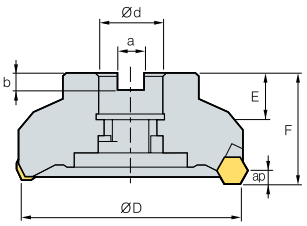


Fig. 1

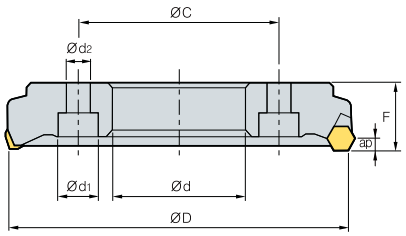


Fig. 2

AA 30°

• AR : 5°
• RR : -3°

(inch)

Designation		⊙	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
DPHA	5400R/L	8	4.0	1.250	-	-	0.500	0.319	0.866	2.000	-	0.275	5.06	1
	5500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.275	9.68	1
	5600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.275	14.74	1
	5800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.275	14.30	2
	51000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.275	19.80	2
	51200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.275	26.40	2
	51400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.275	31.90	2
	51600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.275	38.94	2
	51800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.275	46.20	2

Available Inserts

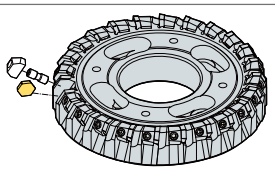
HPEN

HPEN-WC

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
HPEN	090408FN															E07
	090408SN															
	090408EN															
	090408-WC															

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	PC6510
	260 ~ 490	0.004 ~ 0.012	H01
	260 ~ 490	0.004 ~ 0.012	G10

Assembling	

Available Inserts E07

Parts

Specification	 Wedge	 Wedge Screw	 Wrench
Ø4.0~Ø18.0	WDPH5R/L	DHA0821F	HW40

PNHA4000/5000

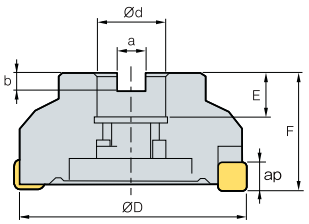


Fig. 1

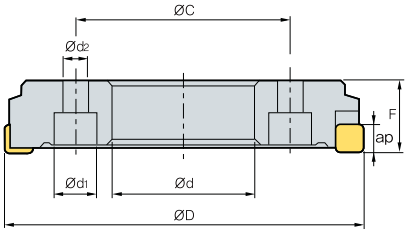


Fig. 2

AA 0°

- AR : -5°
- RR : -6°

(inch)

Designation		⌀	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
PNHA	**44500R/L**	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.5	7.48	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.5	12.10	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.5	12.10	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.5	16.94	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.5	23.10	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.5	28.38	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.5	35.42	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.5	42.02	2
PNHA	**5500R/L**	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.625	7.48	1
	5600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.625	11.66	1
	5800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.625	11.88	2
	51000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.625	16.72	2
	51200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.625	22.88	2
	51400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.625	28.16	2
	51600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.625	34.98	2
	51800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.625	41.58	2

Available Inserts

SNEF

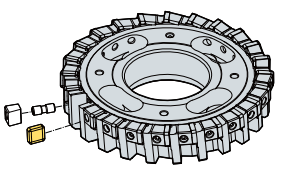
Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEF	**435**															E17

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(int)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~ 0.012	**G10**

Parts

Specification	Wedge	Wedge Screw	Wrench
Ø5.0-Ø18.0	WANH4N	DHA0821F	HW40
Ø5.0-Ø18.0	WANH5N		

Assembling	
	

Available Inserts **E17**

PPHA4000

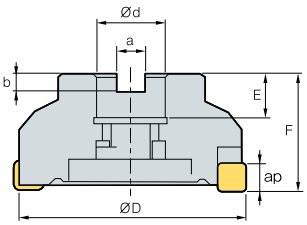


Fig. 1

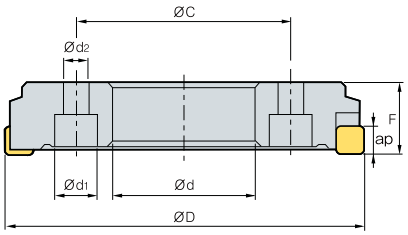


Fig. 2

AA 90°

- AR : 5°
- RR : -6°

(inch)

Designation		⊙	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
PPHA	**4500R/L**	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.5	7.48	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.5	11.66	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.5	12.10	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.5	16.94	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.5	23.10	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.5	28.60	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.5	35.20	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.5	41.80	2

Available Inserts

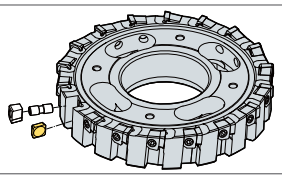
SPEN-WC

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPEN	**434-WC**															E19

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc(sfm)	fz(ipt)	
K	330 ~ 660	0.002 ~ 0.012	**PC6510**
	260 ~ 490	0.004 ~ 0.012	**H01**
	260 ~ 490	0.004 ~ 0.012	**G10**

Assembling



Parts

Specification	 Wedge	 Wedge Screw	 Wrench
Ø5.0~Ø18.0	WPPH4R/L	DHA0821F	HW40

Available Inserts **E19**

SVMA4000

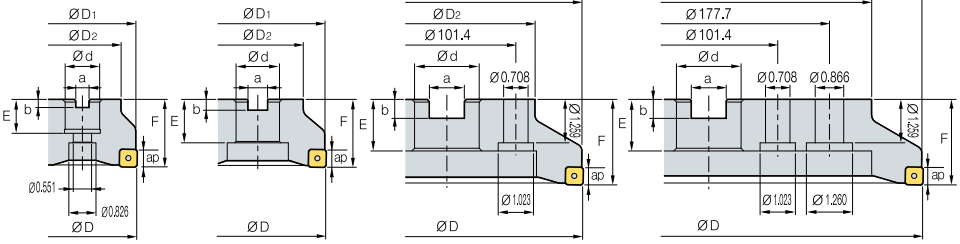


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVMA	**4300R/L-Z8**	8	3.00	2.88	2.20	1.00	0.375	0.248	0.866	2.0	0.04	2.32	1
	4400R/L-Z12	12	4.00	3.88	2.87	1.25	0.500	0.319	0.866	2.0	0.04	5.07	1
	4500R/L-Z16	16	5.00	4.88	3.39	1.50	0.625	0.394	1.181	2.5	0.04	7.94	2
	4600R/L-Z18	18	6.00	5.88	4.88	2.00	0.750	0.433	1.181	2.5	0.04	10.8	2
	4800R/L-Z24	24	8.00	6.88	5.12	2.50	1.000	0.551	1.496	2.5	0.04	16.67	3
	41000R/L-Z30	30	10.0	9.88	7.09	2.50	1.000	0.551	1.496	2.5	0.04	26.48	3
	41200R/L-Z34	34	12.0	11.88	9.45	2.50	1.000	0.551	1.496	2.5	0.04	40.79	4

Available Inserts

SNEU-MF

SNEU1204ANN-MF

SNEU-WMF

SNEU-TBW

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEU	**120420-MF**									●						E17
	1204ANN-MF															
	1204R-WMF															
	1204-TBW															

Parts

Specification	Wedge	Wedge Screw	Contract Screw	Wrench
Ø3.00~Ø12.0	WKAJ3	DTA0619	XTKA0412	TW15-100

Available Inserts **E17**

SVUA6000

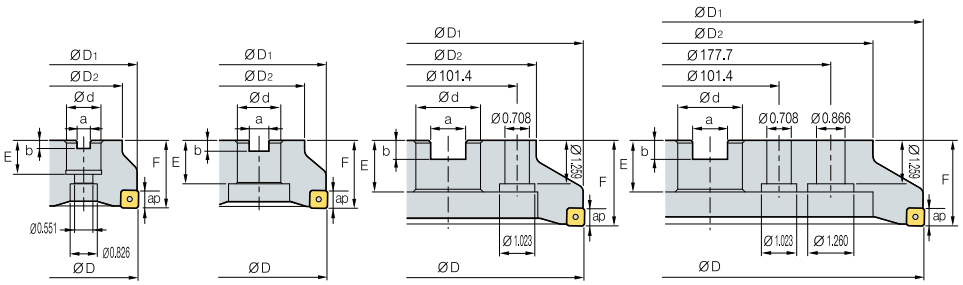


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(inch)

Designation		⭘	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVUA	**6300R/L-4Z**	4	3.00	2.960	2.200	1.00	0.375	0.248	0.866	2.0	0.55	2.60	1
	6400R/L-4Z	4	4.00	3.920	2.874	1.25	0.500	0.319	1.181	2.0	0.55	5.07	1
	6500R/L-4Z	4	5.00	4.921	3.386	1.50	0.625	0.394	1.181	2.5	0.55	7.72	2
	6600R/L-4Z	4	6.00	5.921	4.882	2.00	0.750	0.433	1.181	2.5	0.55	11.02	3
	6800R/L-6Z	6	8.00	7.921	5.118	2.50	1.000	0.551	1.496	2.5	0.55	15.87	3
	61000R/L-6Z	6	10.0	9.921	7.087	2.50	1.000	0.551	1.496	2.5	0.55	26.45	3
	61200R/L-8Z	8	12.0	11.921	9.449	2.50	1.000	0.551	1.496	2.5	0.55	43.00	4

Available Inserts

LNCS(R3.0)

LNCS(C1.5)

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	**1907-R3.0-WC**															E09
	1907-C1.5-WC															

Parts

Specification	Screw	Wrench
Ø3.00~Ø12.0	FTNA0513	TW20-100

Available Inserts E09

SVUA6000-B

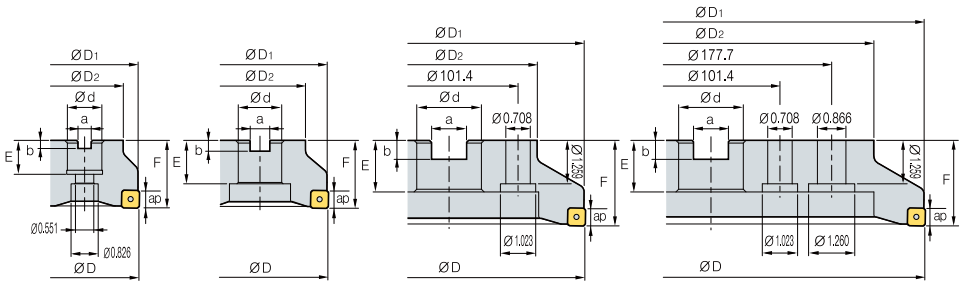


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(inch)

Designation		⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVUA	**6300R/L-4Z-B**	8	3.0	3.118	2.205	1.00	0.375	0.248	0.866	2.0	0.53	2.60	1
	6400R/L-4Z-B	10	4.0	4.118	2.874	1.25	0.500	0.319	1.181	2.0	0.53	5.07	2
	6500R/L-4Z-B	14	5.0	5.118	3.386	1.50	0.625	0.394	1.181	2.5	0.53	7.72	2
	6600R/L-4Z-B	18	6.0	6.118	4.882	2.00	0.750	0.433	1.181	2.5	0.53	11.02	2
	6800R/L-6Z-B	24	8.0	8.118	5.118	2.50	1.000	0.551	1.496	2.5	0.53	15.87	3
	61000R/L-6Z-B	30	10.0	10.118	7.087	2.50	1.000	0.551	1.496	2.5	0.53	26.45	3
	61200R/L-8Z-B	34	12.0	12.118	9.449	2.50	1.000	0.551	1.496	2.5	0.53	43.00	4

Available Inserts

LNCS(R3.0)

LNCS(C1.5)

Designation		Cermet		Coated								Uncoated			Page
		CN2000	CN30	NCM325	NCM335	PC3500	PC3600	PC3545	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	**1907-R3.0-WC**															E09
	1907-C1.5-WC															

Parts

Specification	Locator	Wedge	Wedge Screw	Adjust Screw	Contract Screw	Wrench
Ø3.0~Ø12.0	LSH4R	WSH4	DHA0724F	AZ0619F-D	FTNA0512	TW20-100

Available Inserts **E09**

Gear Cutter Applicable Example

Applicable Example-External tooth Gear

Finishing : M20

- **Cutter Dia** : Ø15.7
- **Tooth No** : 20Tooth
- **External tooth gear** : Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chmpher while milling.

M20XZ130-EX

Semi-finishing

- **Cutter Dia** : Ø11.02
- **Tooth No** : 48Tooth
- Designed for processing of external gear involute curve line shape
- Possible to work for gear root portion R with optimal insert R design

M20-M22-ROU

Roughing

- **Cutter Dia** : Ø11.81
- **Tooth No** : 60Tooth
- High feed rate with low cutting resistance due to V shape insert setting design

LNE333-02-1

LNE434-02-1

KEL1906-C0.6-MF

Applicable Example-Internal tooth Gear

Finishing : M16

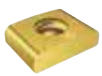
- **Cutter Dia** : Ø15.7
- **Tooth No** : 20Tooth
- **Internal tooth gear** : Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chmpher while milling.

M16XZ130

Semi-finishing

- **Cutter Dia** : Ø11.02
- **Tooth No** : 48Tooth
- The semi-finishing cutter was designed for processing of external gear involute curb line shape.

M16-M18-ROU



LNE433-R60

Roughing

- **Cutter Dia** : Ø22
- **Tooth No** : 40Tooth
- Possible to use for gear processing of all module due to step type of insert setting design

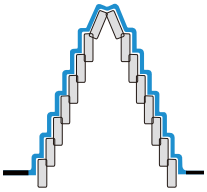
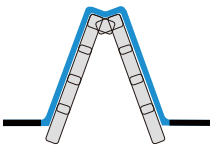
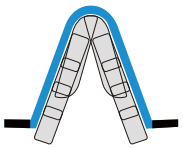
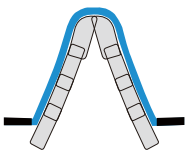
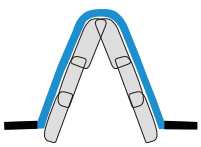
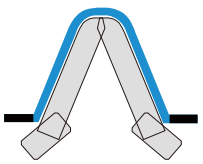
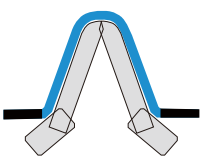
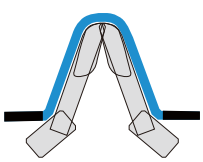
KEL1906-C0.6-MF

LNE434-02-1

Gear Cutter Machining Example

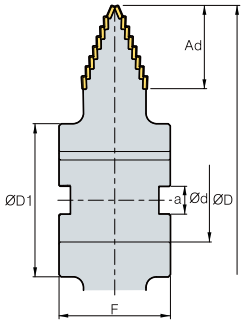
- **Machine**
  Gleason-PFAUTER CNC Hobbing Machine (Power : 52kW)
- **Cutting condition**
  vc = 393.64sfm, n=86.8rpm
  fz = 0.020 ipt, vf=17.717ipm
  ae = 1.417inch
  Dry
- **Tools**
  M16-PT-RACK-KOR03 (Ø17.3 x W3.54)
- **Semi-finishing cutter (low cut, low resistance)**

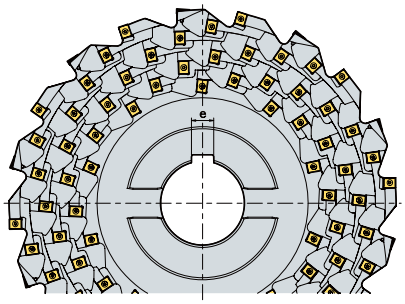
- **Machine**
  KARATS (30kw)
- **Cutting condition**
  vc = 492.13sfm, n=119rpm
  fz = 0.004ipt, vf=3.213ipm
  ae = 1.772inch
  Dry
- **Tools**
  M24 Semi-finishing External type Applicable Insert
  M40-ROU(Main),
  CPE424-01(Flank)

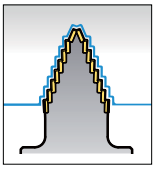
Type	Cutter Shape	Cutting edge Shape	Type	Figure
Roughing			Step Type	1. Working for big sized gear tooth 2. Low cutting resistance with step type insert setting
			V shape Type	1. Low cutting resistance with V shape cutting insert setting 2. Optimal cutting edge line setting according to Rach type & cutting edge sahpe
Semi-finishing			Low cutting resistance Type	1. 4 Corner insert on Root portion 2. 3D chip breaker shape on flank 3. Optimal cutting edge line setting for low cutting resistance
			External gear high rigidity Type	1. Optimal R type insert setting on Root portion 2. Superior Semi-finishing cutting with high rigidity shape of cutter & insert
			Internal gear high rigidity Type	1. Exclusive semi-finishing Internal Gear insert 2. Optimal cutting edge line setting with Internal tooth shape
Finishing			External gear	1. Concave shape of cutting edge line according to external gear type 2. Optimal cutting insert setting design according to a customer conditions
			Internal gear	1. 2 corner insert setting on right & left side and chamfering insert setting 2. Adjustable chamfering cartridge use for chamfering control
			2STEP type	1. Exclusive insert for machining the root part 2. 4-cornered insert

• Optimal cutting insert setting design according to customer condition

Gear Roughing Cutter (Step Type)







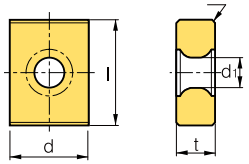
(mm)

m	⊚	ØD	Ad	Ød	ØD1	a	e	F
30	96	450	90	100	180	25	14	140
	108	500	90	100	180	25	14	140
	120	560	90	120	220	40	32	160
40	112	450	105	100	180	25	14	140
	126	500	105	100	180	25	14	140
	140	560	105	120	220	40	32	160
50	160	560	119	120	220	40	32	160

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

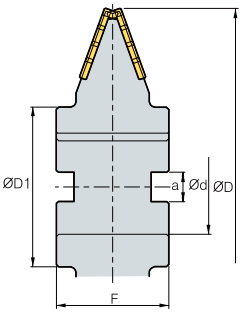
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
 Reinforced cutting Edge	LNE	434-02-1			○	轉			19.05	14.29	6.35	5.4	0.6	
 Low cutting Resistance	KEL	1906-C0.6-MF			○	轉			19.05	14.29	6.35	5.4	0.6	
		190610-MR			○	轉			19.05	14.29	6.35	5.4	-	

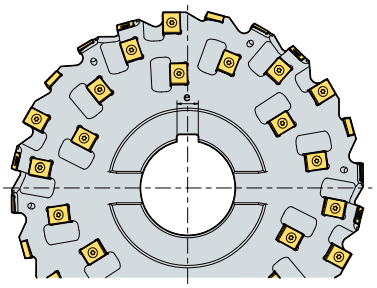
◎ : 1st Rec ○ : 2rd Rec

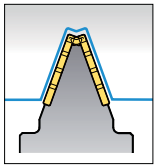
M This is metric size. We can also provide in inch type

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Roughing Cutter (V shape Type)







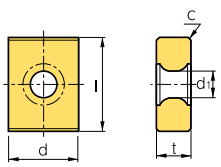
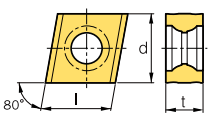
(imm)

m	Type	⊚	ØD	Ød	ØD1	a	e	F
20	rack	48	280	80	135	25	18	95
22	rack	48	280	80	135	25	18	95
24	rack	48	320	80	145	25	18	105
26	rack	60	320	80	145	25	18	105
28	rack	96	400	100	180	25	24	130
30	rack	96	400	100	180	25	24	130
32	rack	96	400	100	180	25	24	130
34	rack	112	400	100	180	25	24	130
36	rack	112	450	100	180	25	24	130
38	rack	112	450	100	180	25	24	130
40	rack	128	450	100	180	25	24	160
42	rack	128	450	100	180	25	24	160
44	rack	128	560	120	220	32	32	160
46	rack	144	560	120	220	32	32	160
48	rack	144	560	120	220	32	32	160
50	rack	144	560	120	220	32	32	160

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

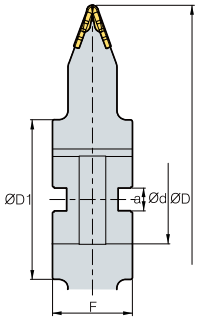
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
 Reinforced cutting Edge	LNE	**434-02-1**			○	轉			19.05	14.29	6.35	5.4	0.6	
 Low cutting Resistance	LNE	**1906-C0.6-MF**			○	轉			19.05	14.29	6.35	5.4	0.6	
		190610-MR							19.05	14.29	6.35	5.4	-	
 Reinforced cutting Edge	KEL	**333-02-1**			○	轉			14.3	12.7	6.35	5.8	0.8	
	CNHQ	**1005-C0.5**							10	10	5.4	-	-	

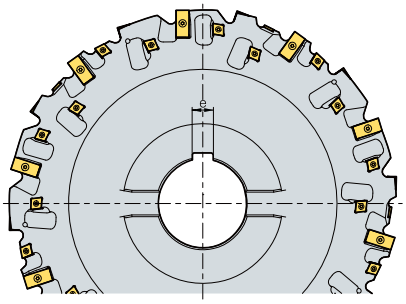
M This is metric size. We can also provide in inch type

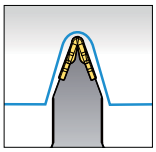
◎ : 1st Rec ○ : 2rd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Semi-finishing Cutter
(Low cutting resistance Type)







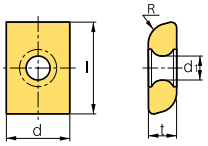
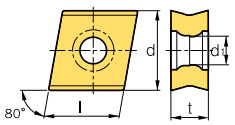
(mm)

m	No.of teeth	⊚	ØD	Ød	ØD1	a	e	F
6	30,60,120	18	250	60	100	25	14	70
8	30,60,120	18	250	60	100	25	14	80
10	30,60,120	24	250	60	100	25	14	80
12	30,60,120	24	250	60	100	25	14	90
14	30,60,120	24	280	80	135	25	18	95
16	30,60,120	32	280	80	135	25	18	100
18	30,60,120	32	320	80	145	25	18	105
20	30,60,120	64	400	100	180	25	24	110
22	30,60,120	64	400	100	180	25	24	110
24	30,60,120	64	400	100	180	25	24	120

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

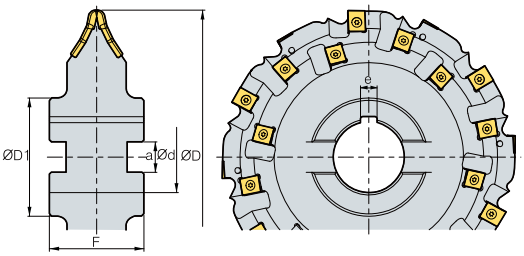
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
		**M6-2ST**			○	輝			19.05	11.6	3.8	4.4	2.25	
		M8-2ST			○	輝			19.05	11.6	4	4.4	3	
		M10-2ST			○	輝			19.05	11.6	4.76	4.4	3.75	
		M12-2ST			○	輝			19.05	14.3	6.35	5.5	4.5	
		M14-2ST			○	輝			25.4	14.3	6.35	5.5	5.25	
		M16-2ST			○	輝			31.8	14.3	7.14	5.5	6	
		M18-2ST			○	輝			31.8	14.3	7.14	5.5	6.75	
		M20-2ST			○	輝			31.8	14.3	9.52	5.5	7.5	
		M22-2ST			○	輝			31.8	14.3	9.52	5.5	8.25	
		M24-2ST			○	輝			31.8	14.3	9.52	5.5	9	
	KEC	**120606-MX**			○	輝			12	12.7	6.35	4.5	-	
		150708-MX			○	輝			15.15	15	7.6	5.8	-	

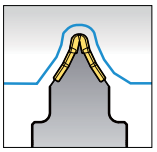
M This is metric size. We can also provide in inch type

※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2rd Rec

Gear Semi-finishing Cutter
(High rigid edge Type, External Gear)





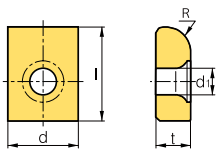
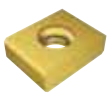
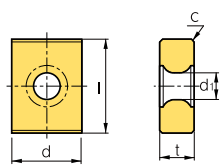
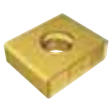
(mm)

m	No.of teeth	⚙	ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

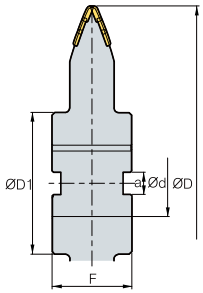
Picture	Designation		Coated				Uncoated		Dimensions (inch)						Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	R	c	
		**M8-ROU**			○	◎			15.875	11	4.76	4.6	4.6	-	
		M12-M14-ROU			○	◎			19.05	14.29	6.35	5.4	5.4	-	
		M16-M18-ROU			○	◎			19.05	14.29	7	5.4	5.4	-	
		M20-M22-ROU			○	◎			19.05	14.29	7.94	5.4	5.4	-	
		M40-ROU			○	◎			25.4	14.29	9.52	5.4	5.4	-	
	LNE	**434-02-1**			○	◎			19.05	14.29	6.35	5.4	-	0.6	
	KEL	**1906-C0.6-MF**			○	◎			19.05	14.29	6.35	5.4	-	0.6	
		190610-MR			○	◎			19.05	14.29	6.35	5.4		-	

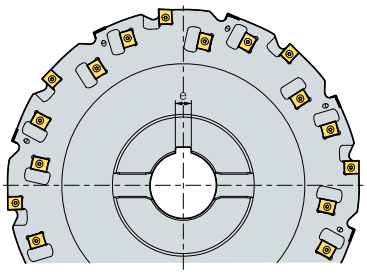
M This is metric size. We can also provide in inch type

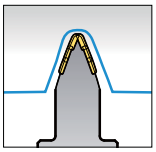
◎ : 1st Rec ○ : 2rd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Semi-finishing Cutter
(High rigid edge Type, Internal Gear)







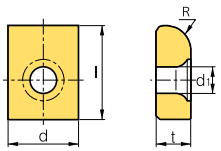
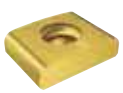
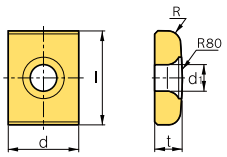
(mm)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

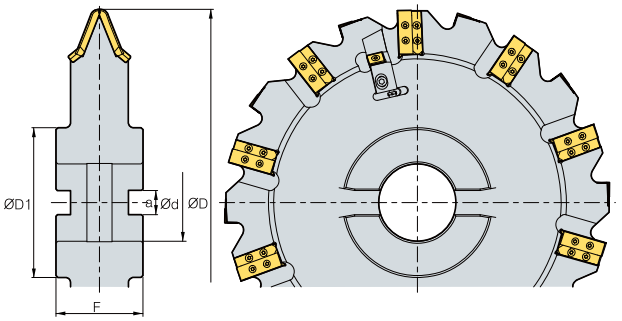
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
		**M8-ROU**			○	鞭			15.875	11	4.76	4.6	2	
		M12-M14-ROU			○	鞭			19.05	14.29	6.35	5.4	3	
		M16-M18-ROU			○	鞭			19.05	14.29	7	5.4	5	
		M20-M22-ROU			○	鞭			19.05	14.29	7.94	5.4	7	
		M40-ROU			○	鞭			25.4	14.29	9.52	5.4	10	
	LNE	**433-R80**			○	鞭			19.05	14.29	5.56	5.4	2.5	

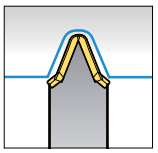
M This is metric size. We can also provide in inch type

◎ : 1st Rec ○ : 2rd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Finishing Cutter (1 Step Type, External Gear)





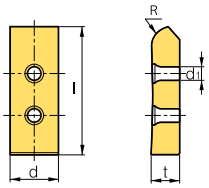
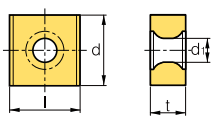
(mm)

m	⊙	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

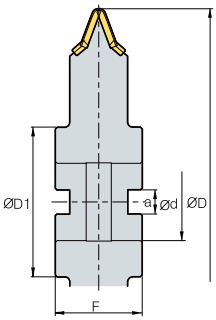
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	
		M6			○	◎			19	14.3	5	5.5	2.25	
		M8			○	◎			27	14.3	5.4	5.5	3	
		M10			○	◎			29	14.3	6.35	5.5	3.75	
		M12			○	◎			33	14.3	6.35	5.5	4.5	
		M14			○	◎			39	14.3	6.35	5.5	5.25	
		M16			○	◎			43	14.3	7.94	5.5	6	
		M18			○	◎			50	14.3	7.94	5.5	6.75	
		M20			○	◎			54	14.3	9.53	5.5	7.5	
		M22			○	◎			57	14.3	9.53	5.5	8.25	
		M24			○	◎			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8			○	◎			15.875	15.875	7.94	-	-	

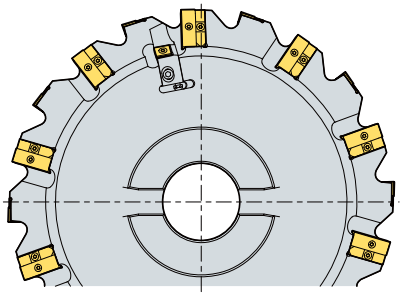
M This is metric size. We can also provide in inch type

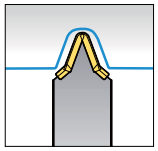
◎ : 1st Rec ○ : 2rd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Finishing Cutter
(1 Step Type, Internal Gear)







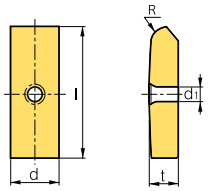
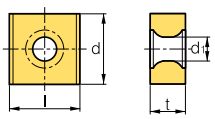
(mm)

m	⊙	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

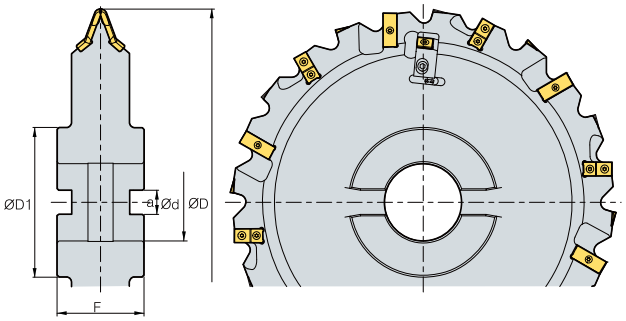
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	
		**M6**			○	鞰			19	14.3	5	5.5	2.25	
		M8			○	鞰			27	14.3	5.4	5.5	3	
		M10			○	鞰			29	14.3	6.35	5.5	3.75	
		M12			○	鞰			33	14.3	6.35	5.5	4.5	
		M14			○	鞰			39	14.3	6.35	5.5	5.25	
		M16			○	鞰			43	14.3	7.94	5.5	6	
		M18			○	鞰			50	14.3	7.94	5.5	6.75	
		M20			○	鞰			54	14.3	9.53	5.5	7.5	
		M22			○	鞰			57	14.3	9.53	5.5	8.25	
		M24			○	鞰			64	14.3	9.53	5.5	9	
	SNEQ	**1507-C0.8**			○	鞰			15.875	15.875	7.94	-	-	

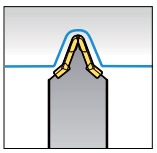
M This is metric size. We can also provide in inch type

※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2rd Rec

Gear Finishing Cutter
(2 Step Type, Internal / Externa Gear)





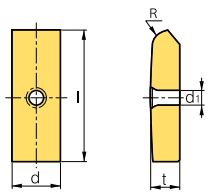
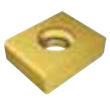
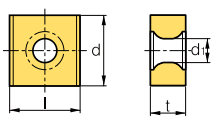
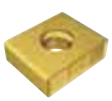
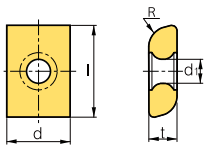
(mm)

m	⦾	ØD	Ød	ØD1	a	F
6	24	400	80	155	25	90
8	24	400	80	155	25	90
10	24	400	80	155	25	90
12	24	400	80	155	25	90
14	24	400	80	155	25	90
16	24	400	80	155	25	90
18	24	400	80	155	25	90
20	24	400	80	155	25	90
22	24	400	80	155	25	90
24	24	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available Inserts

(mm)

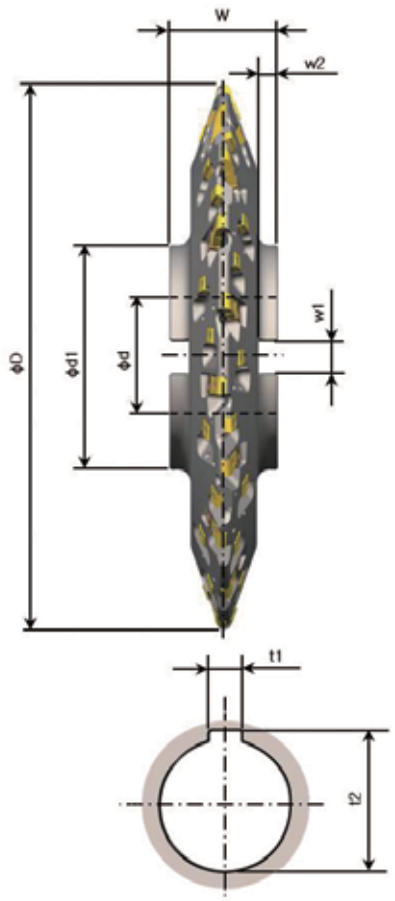
Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	
		**M6**		◦		▦			19	14.3	5	5.5	2.25	
		M8		◦		▦			27	14.3	5.4	5.5	3	
		M10		◦		▦			29	14.3	6.35	5.5	3.75	
		M12		◦		▦			33	14.3	6.35	5.5	4.5	
		M14		◦		▦			39	14.3	6.35	5.5	5.25	
		M16		◦		▦			43	14.3	7.94	5.5	6	
		M18		◦		▦			50	14.3	7.94	5.5	6.75	
		M20		◦		▦			54	14.3	9.53	5.5	7.5	
		M22		◦		▦			57	14.3	9.53	5.5	8.25	
		M24		◦		▦			64	14.3	9.53	5.5	9	
	SNEQ	**1507-C0.8**		◦		▦			15.875	15.875	7.94	-	-	
		**M6-2ST**							19.05	11.6	3.8	4.4	2.25	
		M8-2ST							19.05	11.6	4	4.4	3	
		M10-2ST							19.05	11.6	4.76	4.4	3.75	
		M12-2ST							19.05	14.3	6.35	5.5	4.5	
		M14-2ST							25.4	14.3	6.35	5.5	5.25	
		M16-2ST							31.8	14.3	7.14	5.5	6	
		M18-2ST							31.8	14.3	7.14	5.5	6.75	
		M20-2ST							31.8	14.3	9.52	5.5	7.5	
		M22-2ST							31.8	14.3	9.52	5.5	8.25	
		M24-2ST							31.8	14.3	9.52	5.5	9	

M This is metric size. We can also provide in inch type

◎ : 1st Rec ○ : 2rd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Cutter Order Form



Cutter Type

☐ **Roughing** ☐ **Semi-finishing** ☐ **Finishing**

☐ Step ☐ Low cutting resistance ☐ 1 Step

☐ V shape ☐ High rigid edge ☐ 2 Step

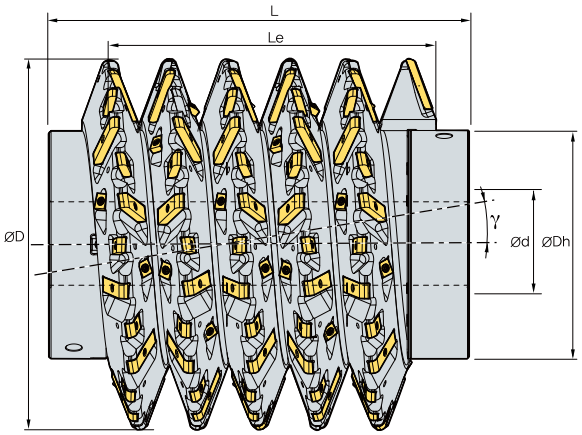
- Stock for finishing(one side) (inch) :
- Outside diameter D(inch) :
- Bore diameter d(inch) :
- Hub diameter d1(inch) :
- Cutter width W(inch) :
- Radial keyway w1(inch) :
- Radial keyway w2(inch) :
- Axial keyway t1(inch) :
- Axial keyway t2(inch) :

Involute Gear Data

☐ **External Gear** ☐ **Internal Gear** ☐ **Rack Gear**

- Diametral pitch DP :
- No.of teeth Z :
- Pressure angle α(°) :
- Helix angle β(°) :
- Addendum modification coefficient x :
- Tip diameter da(inch) :
- Root diameter d_f(inch) :
- Root radius ρ_{fp}(inch)
- Base tangent length W_k(inch)
- No. of measuring teeth K :
- Dimensions / Dimension over balls M_d(inch) :
- Ball diameter D_M(inch) :
- Gear quality (DIN, AGMA) :

Indexable HOB New

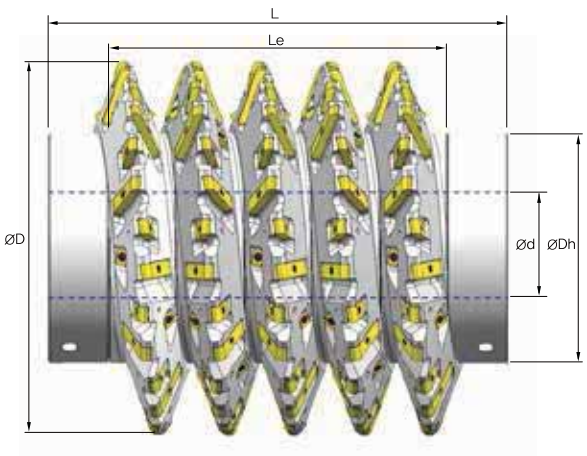


(mm)

Gear Module	ØD	ØDh	Ød	No.Segm. (Pitch)	Le	Segment insert	Total insert	γ (Lead Ang.)
6	180	125	40	6	(113)	15	90	2.084
	210	125	50	6	(113)	17	102	1.763
	240	160	60	6	(113)	19	114	1.528
7	180	125	40	6	(132)	15	90	2.469
	210	125	50	6	(132)	17	102	2.084
	240	160	60	6	(132)	19	114	1.803
8	210	125	50	6	(151)	17	102	2.413
	240	160	60	6	(151)	19	114	2.084
	270	180	80	6	(151)	21	126	1.834
9	210	125	50	6	(169)	17	102	2.751
	240	160	60	6	(169)	19	114	2.372
	270	180	80	6	(169)	21	126	2.084
10	210	125	50	6	(189)	17	102	3.099
	240	160	60	6	(189)	19	114	2.666
	270	180	80	6	(189)	21	126	2.339
12	240	140	60	6	(226)	18	108	3.276
	270	180	80	6	(226)	22	132	2.866
	350	215	80	6	(226)	26	156	2.149
14	270	180	80	6	(264)	22	132	3.415
	350	215	80	6	(264)	26	156	2.547
16	270	160	80	6	(302)	22	132	3.989
	350	215	80	6	(302)	26	156	2.959
18	270	145	80	5	(283)	22	110	4.589
	350	215	80	5	(283)	26	130	3.383
20	350	215	80	5	(314)	26	130	3.823
	450	265	100	5	(314)	34	170	2.866

M This is metric size. We can also provide in inch type

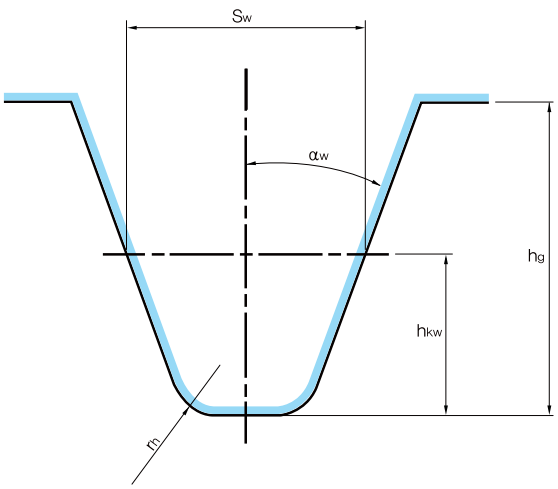
Indexable HOB



Tool SPEC.

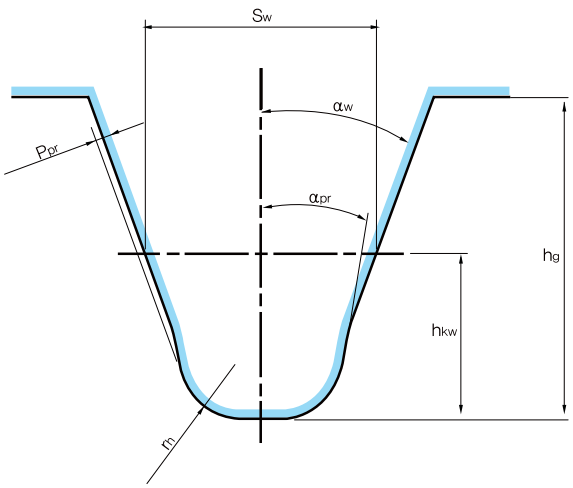
- Outside diameter ØD(inch) :
- Bore diameter Ød(inch) :
- Hub diameter ØDh(inch) :
- Hob length L(inch) :
- Cutting length Le(inch) :
- Spiral direction RH/LH :
- Quality class acc. to DIN 3968 :

Profile of Hob [Module m6 ~]



- Module M(inch) :
- Addendum hkw(inch) :
- Tooth thickness Sw(inch) :
- Tooth depth hg(inch) :

Profile of Roughing hob [Module m8 ~]



- Pressure angle α_w(inch) :
- Protuberance amount P_{pr}(inch) :
- Protuberance angle α_{pr}(inch) :
- Tip radius r_h(inch) :

F

ENDMILLS

Korloy Endmills, New technology and technical know-how, the best qualified for increasing productivity and machinability.

Technical Information for Endmills

Solid Endmills

Solid Endmills

Brazed Endmills

Special Endmill order Form

ENDMILLS

HP R E A 2 01250 - 2.50 -

1	2	3	4	5	6	7
Series	Type	Endmill	America	No. of Flutes	Cutting Dia.	Overall Length

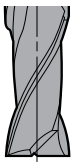
1 Series

HP R E A 2 01250 - 2.50 - R T - V N S

I : Infinity-Max Endmill
HP : High performance-Max Endmill
C : Copper-Max Endmill
D : Dia coated-Max Endmill
V : Variable Endmill
FM : Feed-up Endmill

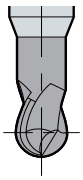
2 Type

HP R E A 2 01250 - 2.50 - R T - V N S



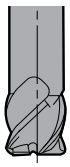
Flat type

F



Ball type

B



Radius type

R

3 Endmill

HP R E A 2 01250 - 2.50 - R T - V N S

4 America

HP R E A 2 01250 - 2.50 - R T - V N S

5 No. of Flutes

HP R E A 2 01250 - 2.50 - R T - V N S

2 Flutes

2

3 Flutes

3

4 Flutes

4

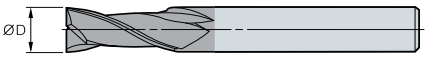
6 Flutes

6

※ The above code system is not applied for SSEA and ZSE.

6 Cutting Dia

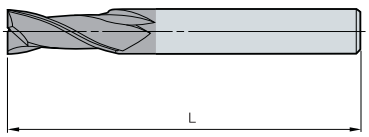
HP R E A 2 01250 - 2.50 - R T - V N S



Notation	ØD
01250	Ø0.1250
01562	Ø0.1562
02500	Ø0.2500
05000	Ø0.5000

7 Overall Length

HP R E A 2 01250 - 2.50 - R T - V N S



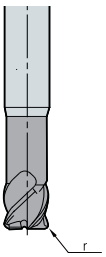
Overall Length	
Notation	L(inch)
2.50	2.50
4.00	4.00
6.00	6.00

R.01 T000 - V0.62 N0.65 1875

8 Corner Radius | 9 Taper Angle | 10 Length | 11 Neck Length | 12 Shank Diameter

8 Corner Radius

HP R E A 2 01250 - 2.50 - **R** T - V N S



Corner Radius	
Notation	**R(inch)**
R.01	r 0.01
R.02	r 0.02
R.04	r 0.04
R.06	r 0.06

9 Taper Angle

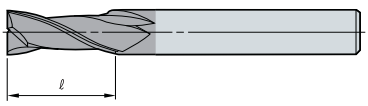
HP R E A 2 01250 - 2.50 - R **T** - V N S

T(θ°) : Taper Angle

Taper Angle	
Notation	**T(θ°)**
T010	1°
T015	1.5°
T100	10°

10 Taper Length

HP R E A 2 01250 - 2.50 - R T - **V** N S

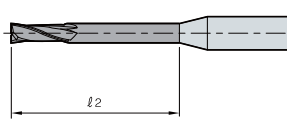


Taper Length	
Notation	**ℓ (inch)**
V0.62	0.62
V0.75	0.75
V1.00	1.00

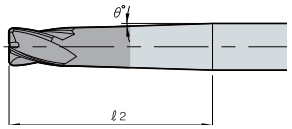
※ This code system is also for special endmills.

11 Neck Length

HP R E A 2 01250 - 2.50 - R T - V **N** S



Long Neck



Taper Long Neck

ℓ_2(mm) : Neck Length

T(θ°) : Taper Angle

Long Neck	
Notation	**ℓ_2(inch)**
N0.65	0.65
N0.80	0.80
N1.25	1.25
N1.30	1.30

Taper Long Neck	
Notation	**ℓ_2 + T(θ°)**
N0.6210	0.62+1°
N0.7515	0.75+1.5°
N1.0020	1.00+2°
N1.2525	1.25+2.5°

12 Shank Diameter

HP R E A 2 01250 - 2.50 - R T - V N **S**

Shank Diameter	
Notation	**Ød**
S1250	Ø0.1250
S1875	Ø0.1875
S2500	Ø0.2500
S3750	Ø0.3750
S4375	Ø0.4375

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
H-Max	Ball	HPBEA2000	PC203F		○	High speed High hardness	2	1/16	5/8	◎		◎		○	◎	F10
		HPBEA2000T	PC203F		○	High speed High hardness	2	1/16	1/2	◎		◎		○	◎	F10
	Radius	HPREA2000	PC203F		○	High speed High hardness	2	3/32	3/32	◎		◎		○	◎	F11
		HPREA4000	PC203F		○	High speed High hardness	4	1/8	5/8	◎		◎		○	◎	F11
		HPREA2000T	PC203F		○	High speed High hardness	2	3/32	3/32	◎		◎		○	◎	F11
		HPREA4000T	PC203F		○	High speed High hardness	4	3/32	5/8	◎		◎		○	◎	F11
New H Endmill M	Ball	PBEA2000	PC303S		○	High speed High hardness	2	0.5	12	○		◎		○	◎	F15
	Radius	PREA4000	PC310U		○	High speed High hardness	4	3	12	○		◎		○	◎	F16
V Endmill M	Flat	VFE4000	PC215F		○	General	4	2.5	16	◎	○	○		○	○	F19
New Z Endmill M	Ball	ZFEA2000	PC315E		○	General	2	1	16	◎	○	◎		○		F23
		ZFEA4000	PC315E		○	General	4	1	16	◎	○	◎		○		F24
	Long Ball	ZSFEA2000	PC315E		○	General	2	1	12	◎	○	◎		○		F25
		ZSFEA4000	PC315E		○	General	4	1	12	◎	○	◎		○		F25
	Flat	ZBEA2000	PC315E		○	General	2	1	12	◎	○	◎		○		F26
New I+ Endmill M		IPFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F30
		IPFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F32
	Long Flat	IPLFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F31
		IPLFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F33
	Taper Flat	IPBE2000	PC320		○	General	2	1	20	◎	○	◎		○		F34
		IPBE4000	PC320		○	General	4	1	20	◎	○	◎		○		F36

M This is metric size. We can also provide in inch

◎ : Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
New I+ Endmill M	Long Ball	IPLBE2000	PC320		○	General	2	1	16	◎	○	◎		○		F35
	Radius	IPRE2000	PC320		○	General	2	1	12	◎	○	◎		○		F37 F38
		IPRE4000	PC320		○	General	4	2	12	◎	○	◎		○		F40
	Long Radius	IPLRE2000	PC320		○	General	2	3	12	◎	○	◎		○		F39
		IPLRE4000	PC320		○	General	4	3	12	◎	○	◎		○		F41
F Endmill M	Standard	FME4000	PC203F		○	High speed	4	6	12	○		○		◎	◎	F44
	Long	FMLE4000	PC203F		○	High speed	4	6	12	○		○		◎	◎	F44
Micro Endmills M	Flat	MSE2000	PC215F		○	High speed	2	0.2	1	○		○		◎	○	F46
	Ball	MSBE2000	PC215F		○	High speed	2	0.2	1	○		○		◎	○	F46
Solid Endmills for difficult to cut material	Flat	IFSEA3000	PC210		-	STS	3	1/8	3/4	○	◎	○		◎		F49
New S+ Endmill M	Flat	SPFE4000	PC325		-	STS	4	1	12	○	◎	○		◎		F52
	Long Flat	SPLFE4000	PC325		-	STS	4	1	12	○	◎	○		◎		F52
Solid Endmills for aluminum	Flat	SSEAA2000	H01 PD3000		- (○)	Aluminum	2	1/16	3/4	○			◎			F54
		SSEAA3000	H01 PD3000		- (○)	Aluminum	3	3/32	5/8	○			◎			F54
	Ball	SSBEAA2000	H01 PD3000		- (○)	Aluminum	2	1/16	3/4	○			◎			F55
New A+ Endmill M	Flat	APFEA2000	H05S		-	Aluminum	2	2.5	20	○			◎			F58
		APFEA3000	H05S		-	Aluminum	3	2.5	20	○			◎			F58
	Long Flat	APLFEA2000	H05S		-	Aluminum	2	3	20	○			◎			F59
		APLFEA3000	H05S		-	Aluminum	3	3	20	○			◎			F59
	Ball	APBEA2000	H05S		-	Aluminum	2	1	12	○			◎			F60
	Roughing	APREA3000	H05S		-	Aluminum	3	4	25	○			◎			F60

M This is metric size. We can also provide in inch

◎ : Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size Min	Size Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
C-Max	Flat	CFEA2000	PC210C		○	Copper, Copper alloy	2	1/16	1/2	○			◎			F62
	Long Neck Flat	CFNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F62
	Ball	CBEA2000	PC210C		○	Copper, Copper alloy	2	1/16	1/2	○			◎			F63
	Long Neck Ball	CBNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F63
	Radius	CREA2000	PC210C		○	Copper, Copper alloy	2	3/32	1/2	○			◎			F64
	Long Neck Radius	CRNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F64
D-Max	Ball	DBEA2000	ND3000		○	Graphite, Aluminum	2	1/8	5/16				◎			F67
	Flat	DFEA2000	ND3000		○	Graphite, Aluminum	2	1/8	5/16				◎			F67
	Radius	DREA2000	ND3000		○	Graphite, Aluminum	2	1/8	5/16				◎			F67
PCD Endmill	Flat	PDEA1000	DP200		-	Nonferrous, High speed	1	0.188	0.188				◎			F69
		PDEA2000	DP200		-	Nonferrous, High speed	2	0.250	0.500				◎			F69
Brazed Endmill M	Flat	ZSE200	FCC PC221F		-(○)	Cast iron, Steel	2	14	50	○	○	◎		○		F71
		ZSE300	FCC PC221F		-(○)	Cast iron, Steel	3	14	50	○	○	◎		○		F71 F72
		ZSE400	FCC PC221F		-(○)	Cast iron, Steel	4	14	50	○	○	◎		○		F72
		ZSE600	FCC PC221F		-(○)	Cast iron, Steel	6	34	50	○	○	◎		○		F72
		ZSEA200	FCC		-(○)	Aluminum, Copper	2	15	50				◎			F73
	Long Flat	ZSEL200	FCC PC221F		-(○)	Cast iron, Steel	2	14	50	○	○	◎		○		F74
		ZSEL400	FCC PC221F		-(○)	Cast iron, Steel	4	16	40	○	○	◎		○		F74
		ZSEXL200	FCC PC221F		-(○)	Cast iron, Steel	2	20	25	○	○	◎		○		F74
	Ball	ZSBE200	FCC PC221F		-(○)	Cast iron, Steel	2	13	50	○	○	◎		○		F75

M This is metric size. We can also provide in inch

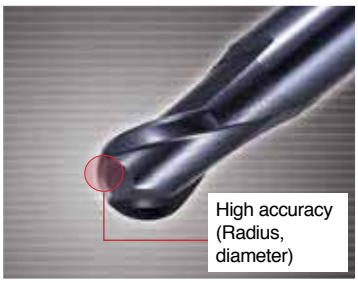
◎ : Excellent ○: Good

New PVD coating technology for anti-corrosion and wear resistance

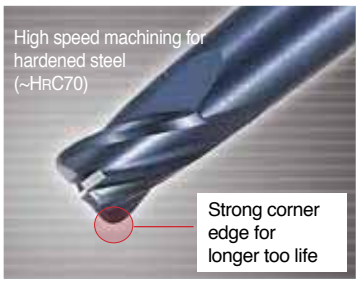
H-Max

- H-max can be used for pre-hardened steel and heat-treated steel
- H-max guarantees highly accurate machining (diameter and radius)
- New PVD coating technology improves anti-corrosion and wear resistance

HPBE



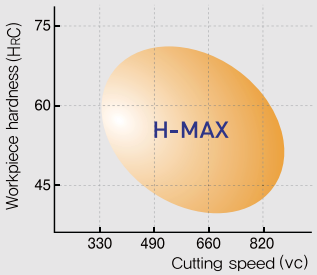
HPRE



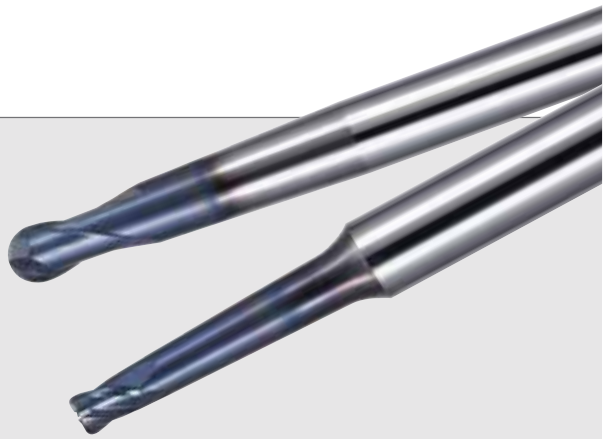
• **Tolerance**
Diameter : 0~-0.015 Radius : 0~-0.005

▶ Ultra fine grade for tougher edge and less chipping
▶ Combination of the new PVD coating and the hardened anti corrosion substrate guarantees excellent performance

Application area (Ball. Radius type)



• Cutting speed vc(m/min)
※ by diameter



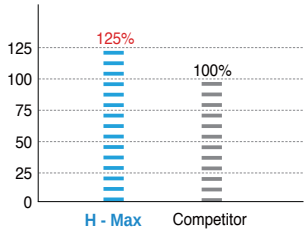
Test examples

■ Joint mold core machining (STD11 HRC54~59)

- Workpiece : STD11 HRC54~59
- Cutting condition : vc =560(sfm), vf=31(ipm)
  ap =0.008 ae=0.02, oil mist
- Tool : HPBE2080 PC203F
- Result : 130min cutting time (Roughing), long tool life, wear resistance, no chipping found

Test Result

	Point	Edge	Edge
H - Max			
Competitor			



Tool life 125% up

Recommended Cutting Condition (HPBEA)

Workpiece / Condition / Diameter(Ø)	NAK80, STD61 (~ HRC 50)			STD11, STS420 (HRC 50~60)			SKH (HRC 60~65)		
	R.P.M n(min-1)	Feed vf(ipm)	Axial depth ap(inch)	R.P.M n(min-1)	Feed vf(ipm)	Axial depth ap(inch)	R.P.M n(min-1)	Feed vf(ipm)	Axial depth ap(inch)
1/16	40,000	170	0.003	40,000	161	32,000	32,000	107	0.002
3/32	40,000	198	0.005	40,000	185	20,000	20,000	65	0.003
1/8	40,000	283	0.005	32,000	182	16,000	16,000	40	0.004
5/32	32,000	257	0.006	24,000	76	12,000	12,000	57	0.004
3/16	26,500	228	0.007	16,000	94	10,000	10,000	48	0.004
7/32	23,750	242	0.007	19,000	104	9,000	9,000	38	0.004
1/4	19,750	187	0.009	15,000	106	6,500	6,500	38	0.004
9/32	18,500	175	0.010	14,000	99	7,000	7,000	37	0.004
5/16	16,000	151	0.012	12,000	85	6,000	6,000	33	0.004
3/8	15,250	144	0.012	11,500	78	5,100	5,100	28	0.004
7/16	11,000	104	0.020	8,500	64	4,080	4,080	23	0.005
1/2	8,250	78	0.020	6,500	48	5,350	5,350	19	0.005
9/16	7,500	71	0.020	6,000	45	4,400	4,400	18	0.006
5/8	6,000	57	0.020	5,000	38	2,500	2,500	15	0.006

Recommended Cutting Condition (HPREA)

Workpiece / Condition / Diameter(Ø)	NAK80, STD61 (~ HRC 50)			STD11, STS420 (HRC 50~60)			SKH (HRC 60~65)		
	R.P.M n(min-1)	Feed vf(ipm))	Axial depth ap(inch)	R.P.M n(min-1)	Feed vf(ipm)	Axial depth ap(inch)	R.P.M n(min-1)	Feed vf(ipm)	Axial depth ap(inch)
1/16	40,000	38	0.004	32,000	21	0.002	24,000	13	0.001
3/32	40,000	69	0.006	20,000	34	0.003	13,500	22	0.002
1/8	32,000	90	0.008	16,000	45	0.004	11,000	28	0.002
5/32	24,000	104	0.012	12,000	52	0.004	8,000	19	0.002
3/16	20,000	120	0.016	10,000	60	0.006	6,650	31	0.003
7/32	18,000	137	0.016	9,000	64	0.006	5,975	37	0.003
1/4	15,000	137	0.016	7,500	69	0.008	4,975	43	0.004
9/32	14,000	137	0.018	7,000	69	0.008	4,650	43	0.004
5/16	12,000	137	0.020	6,000	69	0.008	4,000	43	0.004
3/8	10,200	137	0.020	5,200	69	0.008	3,400	43	0.004
7/16	8,800	125	0.028	4,400	63	0.012	2,950	39	0.008
1/2	7,500	106	0.033	3,750	53	0.012	2,525	33	0.008
9/16	7,000	99	0.035	3,500	50	0.020	2,350	31	0.012
5/8	6,000	85	0.039	3,000	43	0.020	2,000	27	0.012

Cutting speed formulas (Ball Endmills)

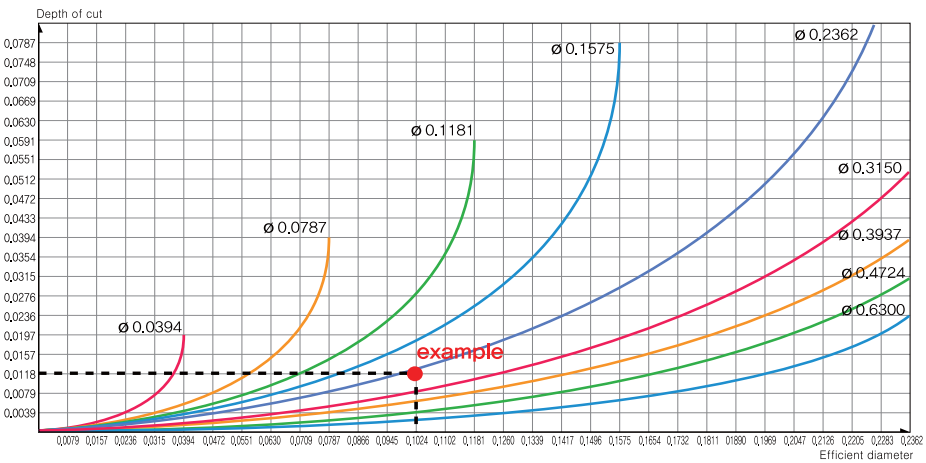
▶ Efficient cutting speed Veff = π × Deff × n/1000 (n=min^{-1})

▶ Efficient diameter Deff calculation formula : Deff=($2\sqrt{ap(D-ap)} \times \alpha$)
D=Ø(Tool diameter), Deff=Efficient diameter

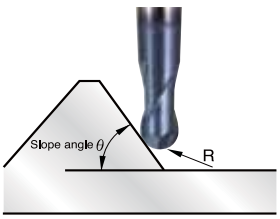
▶ Efficient cutting speed formulas : When slope Ø is 0° Veff = π × Deff × n/1000
Deff = Efficient, diameter Calculate Deff as ap with various ball endmills

α :		
	α= 1	Slope angle θ = 0°
	α= 1.2	Slope angle θ = 7°
	α= 1.5	Slope angle θ = 15°
	α= 1.7	Slope angle θ = 30°
	α= 2.17	Slope angle θ = 45°
	α= 2.3	Slope angle θ = 60°

Cutting speed formulas (Ball Endmills, Slope angle = 0°)



Slope angle = 0°



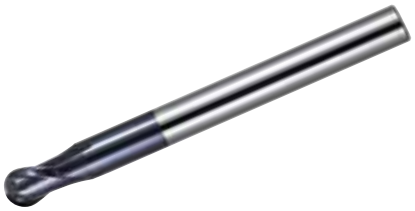
Ex) **Diameter** : 0.236inch, ap=0.0118inch,
Deff=0.1inch, N=14,000(min-1)
Slope angle 0° : Veff = 373(sfm)
Slope angle 15° :
Veff = 373 x 1.5 = 559.5(sfm)

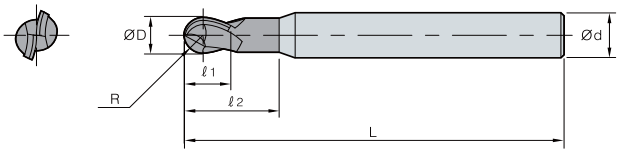
Veff (efficient cutting speed) technical data as per depth and workpiece hardness (H-max, Ball Endmills)

Dimensions		HRC45~55	vc	Efficient cutting speed by depth (z-step=ap)														
Tool diameter	Ball R	RPM	(sfm)	0.003937	0.007874	0.011811	0.015748	0.019685	0.023622	0.027559	0.031496	0.035433	0.03937	0.043307	0.047244	0.051181	0.055118	0.059055
0.0236	0.0118	40,000	247	184	233	247	233	184										
0.0315	0.0157	37,000	305	202	264	295	305	295	264	202								
0.0394	0.0197	35,000	361	216	289	331	353	361	353	331	289	216						
0.0591	0.0295	32,000	495	247	336	396	438	466	485	494	494	485	466	438	396	336	247	
0.0787	0.0394	30,000	618	270	371	442	495	536	567	590	606	615	618	615	606	590	567	536
0.0984	0.0492	28,000	721	283	391	469	529	577	616	648	673	693	707	716	721	721	716	707
0.1181	0.0591	26,000	804	289	401	482	547	599	643	680	711	737	758	775	788	797	802	804
0.1575	0.0787	22,000	907	283	395	478	544	600	648	689	726	758	786	810	831	850	865	878
0.1969	0.0984	20,000	1031	289	404	490	559	618	670	715	756	792	825	854	880	904	926	945
0.2362	0.1181	18,000	1113	285	400	485	555	615	668	715	757	795	830	861	891	917	942	964
0.2756	0.1378	15,000	1082	257	361	438	502	557	606	649	689	725	757	788	816	842	866	888
0.3150	0.1575	13,500	1113	247	348	423	485	539	586	629	668	703	736	767	795	821	846	869
0.3543	0.1772	12,000	1113	233	328	400	459	510	555	596	634	668	700	729	757	783	807	830
0.3937	0.1969	11,000	1134	226	317	387	444	494	539	579	615	649	680	709	737	763	787	810
0.4331	0.2165	10,000	1134	215	303	369	424	472	515	554	589	622	652	680	707	732	756	778
0.4724	0.2362	9,200	1138	207	291	355	409	455	496	533	568	599	629	657	683	707	731	753
0.5118	0.2559	8,500	1139	199	280	342	393	438	478	514	547	578	607	634	659	683	706	728
0.5512	0.2756	7,900	1140	192	271	330	380	423	462	497	529	559	587	613	638	662	684	705
0.5906	0.2953	7,400	1144	186	262	320	369	411	448	483	514	543	571	596	621	644	666	686
0.6299	0.3150	6,900	1138	179	253	309	355	396	432	465	496	524	551	576	599	622	643	663
0.6693	0.3346	6,500	1139	174	246	300	345	385	420	453	482	510	536	560	583	605	626	646
0.7087	0.3543	6,100	1132	168	237	290	334	372	406	438	466	493	518	542	565	586	606	626
0.7480	0.3740	5,800	1136	164	232	283	326	364	397	428	456	483	507	531	553	574	593	613
0.7874	0.3937	5,500	1134	160	226	276	317	354	387	417	444	470	494	517	539	559	579	597

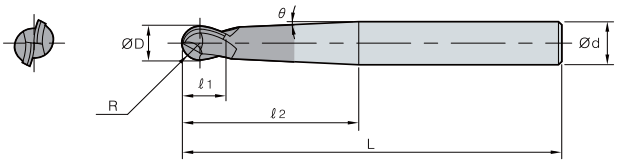
Dimensions		HRC45~55	vc	Efficient cutting speed by depth (z-step=ap)														
Tool diameter	Ball R	RPM	(sfm)	0.003937	0.007874	0.011811	0.015748	0.019685	0.023622	0.027559	0.031496	0.035433	0.03937	0.043307	0.047244	0.051181	0.055118	0.059055
0.0236	0.0118	40,000	247	184	233	247	233	184										
0.0315	0.0157	37,000	305	202	264	295	305	295	264	202								
0.0394	0.0197	35,000	361	216	289	331	353	361	353	331	289	216						
0.0591	0.0295	28,000	433	216	294	346	383	408	424	432	432	424	408	383	346	294	216	
0.0787	0.0394	26,000	536	234	322	383	429	464	491	511	525	533	536	533	525	511	491	464
0.0984	0.0492	24,000	618	242	336	402	453	495	528	555	577	594	606	614	618	618	614	606
0.1181	0.0591	22,000	680	244	339	408	462	507	544	575	602	623	641	656	667	674	679	680
0.1575	0.0787	18,500	763	238	332	402	458	504	545	580	610	637	661	681	699	714	728	739
0.1969	0.0984	16,500	850	238	333	404	461	510	553	590	623	653	680	704	726	746	764	779
0.2362	0.1181	15,000	928	238	333	404	463	513	557	596	631	662	691	718	742	764	785	803
0.2756	0.1378	15,000	1082	257	361	438	502	557	606	649	689	725	757	788	816	842	866	888
0.3150	0.1575	12,000	989	220	309	376	431	479	521	559	594	625	654	682	707	730	752	772
0.3543	0.1772	10,650	988	207	291	355	407	453	493	529	562	593	621	647	672	695	716	736
0.3937	0.1969	9,600	989	197	277	338	388	431	470	505	537	566	594	619	643	666	687	707
0.4331	0.2165	8,700	986	187	264	321	369	411	448	482	512	541	567	592	615	637	657	677
0.4724	0.2362	8,000	989	180	253	309	355	395	431	464	494	521	547	571	594	615	635	654
0.5118	0.2559	7,373	988	173	243	297	341	380	415	446	475	502	527	550	572	593	612	631
0.5512	0.2756	6,800	981	165	233	284	327	364	397	428	456	481	505	528	549	570	589	607
0.5906	0.2953	6,300	974	159	223	273	314	350	382	411	438	463	486	508	528	548	567	584
0.6299	0.3150	5,900	973	153	216	264	304	339	370	398	424	448	471	492	513	532	550	567
0.6693	0.3346	5,600	981	150	212	258	297	332	362	390	416	439	462	483	503	522	539	557
0.7087	0.3543	5,300	983	146	206	252	290	323	353	380	405	429	450	471	491	509	527	544
0.7480	0.3740	5,000	979	142	200	244	281	313	342	369	393	416	437	457	476	494	512	528
0.7874	0.3937	4,700	969	137	193	236	271	303	331	356	380	402	422	442	460	478	494	510

HPBEA2000 (Ball) / 2000L (Long Ball)





HPBEA2000T (Taper Ball)

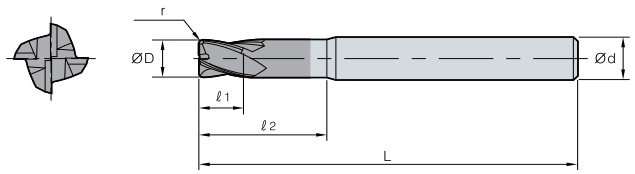


ØD	Tolerance	R Tolerance
Ø0.0625~Ø0.2188	0 ~ - 0.0008	±0.0002
Ø0.2500~Ø0.6250	0 ~ - 0.0010	±0.0004

(inch)

Designation		R	ØD		Ød	ℓ1	ℓ2	L	θ°
HPBE 2	200625	1/32	1/16	0.0625	0.1250	0.0787	0.1575	2.00	-
	200938	3/64	3/32	0.0938	0.1250	0.1181	0.2362	2.00	-
	201250	1/16	1/8	0.1250	0.1250	0.1575	0.3150	2.00	-
	201562	5/64	5/32	0.1562	0.1875	0.1969	0.3937	2.50	-
	201875	3/32	3/16	0.1875	0.1875	0.2362	0.4724	2.50	-
	202188	7/64	7/32	0.2188	0.2500	0.2756	0.5512	2.50	-
	202500	1/8	1/4	0.2500	0.2500	0.3150	0.6299	3.00	-
	202812	9/64	9/32	0.2812	0.3125	0.3543	0.7087	3.00	-
	203125	5/32	5/16	0.3125	0.3125	0.3937	0.7874	3.00	-
	203750	3/16	3/8	0.3750	0.3750	0.4331	0.8661	3.00	-
	204375	7/32	7/16	0.4375	0.4375	0.4724	0.9449	3.50	-
	205000	1/4	1/2	0.5000	0.5000	0.5118	1.0236	3.50	-
	20 5625	9/32	9/16	0.5625	0.5625	0.5906	1.1811	4.00	-
	206250	5/16	5/8	0.6250	0.6250	0.6693	1.3386	4.00	-
	202500L	1/8	1/4	0.2500	0.2500	0.2756	0.5512	3.50	-
	202812L	9/64	9/32	0.2812	0.3125	0.3150	0.6299	3.50	-
	203125L	5/32	5/16	0.3125	0.3125	0.3543	0.7087	4.00	-
	203750L	3/16	3/8	0.3750	0.3750	0.3937	0.7874	4.00	-
	200625-T2-10236	1/32	1/16	0.0625	0.1250	0.0787	1.0236	2.00	1
	200625-T4-06299	1/32	1/16	0.0625	0.1250	0.0787	0.6299	2.00	2
	200938-T2-16142	3/64	3/32	0.0938	0.1250	0.1181	1.6142	3.00	1
	200938-T4-11417	3/64	3/32	0.0938	0.1250	0.1181	1.1417	2.50	2
	201250-T2-20079	1/16	1/8	0.1250	0.1250	0.1575	2.0079	3.00	1
	201250-T4-11417	1/16	1/8	0.1250	0.1250	0.1575	1.1417	2.50	2
	201562-T2-24016	5/64	5/32	0.1562	0.1875	0.1969	2.4016	3.50	1
	201562-T4-13386	5/64	5/32	0.1562	0.1875	0.1969	1.3386	3.00	2
	202500-T2-24803	1/8	1/4	0.2500	0.2500	0.2756	2.4803	3.50	1
	202500-T4-13780	1/8	1/4	0.2500	0.2500	0.2756	1.3780	3.50	2
	203125-T2-26378	5/32	5/16	0.3125	0.3125	0.4331	2.6378	4.00	1
	203125-T4-15354	5/32	5/16	0.3125	0.3125	0.4331	1.5354	4.00	2
	203750-T2-27165	3/16	3/8	0.3750	0.3750	0.5118	2.7165	5.00	1
	203750-T4-16142	3/16	3/8	0.3750	0.3750	0.5118	1.6142	5.00	2
	205000-T2-27953	1/4	1/2	0.5000	0.5000	0.5906	2.7953	5.00	1
	205000-T4-16929	1/4	1/2	0.5000	0.5000	0.5906	1.6929	5.00	2

HPREA2000 / 4000 (Radius)



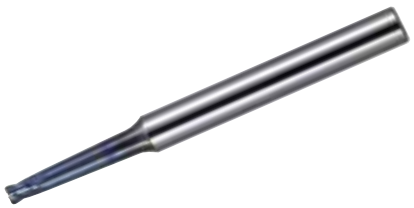
2 | 4 | H·A 30° | TiAlN | Substrate PC203F

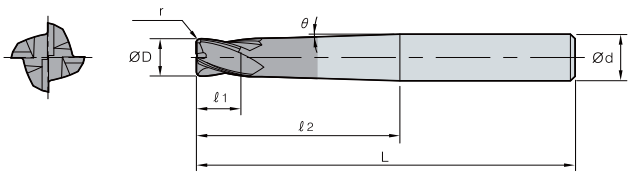
ØD	Tolerance	R Tolerance
Ø0.0625~Ø0.2188	0 ~ - 0.0008	±0.0002
Ø0.2500~Ø0.6250	0 ~ - 0.0010	±0.0004

(inch)

Designation		ØD		Ød	ℓ1	ℓ2	L	r
HPREA 2	200938-R.02	3/32	0.0938	0.1250	0.1181	0.4724	2.50	0.02
HPREA 4	401250-R.02	1/8	0.1250	0.1250	0.1575	0.6299	2.50	0.02
	401562-R.02	5/32	0.1562	0.1875	0.1969	0.7874	2.50	0.02
	402500-R.04	1/4	0.2500	0.2500	0.2756	1.1024	2.50	0.04
	403125-R.08	5/16	0.3125	0.3125	0.3543	1.2205	3.00	0.08
	403750-R.08	3/8	0.3750	0.3750	0.4331	1.2992	3.50	0.08
	405000-R.08	1/2	0.5000	0.5000	0.5118	1.5354	4.00	0.08
	406250-R.08	5/8	0.6250	0.6250	0.6693	2.0079	4.50	0.08

HPREA2000T / 4000T (Taper Radius)





2 | 4 | H·A 30° | TiAlN | Substrate PC203F

ØD	Tolerance	R Tolerance
Ø0.0625~Ø0.2188	0 ~ - 0.0008	±0.0002
Ø0.2500~Ø0.6250	0 ~ - 0.0010	±0.0004

(inch)

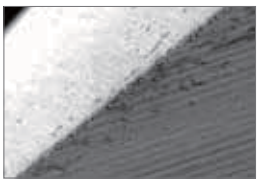
Designation		ØD		Ød	ℓ1	ℓ2	L	r	θ°
HPREA 2	200938-R.02-T2-06299	3/32	0.0938	0.1250	0.1181	0.6299	3.00	0.02	1
	200938-R.02-T4-05118	3/32	0.0938	0.1250	0.1181	0.5118	3.00	0.02	2
HPREA 4	400938-R.02-T2-09055	3/32	0.0938	0.1250	0.1181	0.9055	3.00	0.02	1
	400938-R.02-T4-07087	3/32	0.0938	0.1250	0.1181	0.7087	3.00	0.02	2
	401250-R.02-T2-09449	1/8	0.1250	0.1250	0.1575	0.9449	3.50	0.02	1
	401250-R.02-T4-07480	1/8	0.1250	0.1250	0.1575	0.7480	3.50	0.02	2
	401562-R.02-T2-24016	5/32	0.1562	0.1875	0.1969	2.4016	4.00	0.02	1
	401562-R.02-T4-13386	5/32	0.1562	0.1875	0.1969	1.3386	3.00	0.02	2
	402500-R.04-T2-24803	1/4	0.2500	0.2500	0.2756	2.4803	4.00	0.04	1
	402500-R.04-T4-14173	1/4	0.2500	0.2500	0.2756	1.4173	3.00	0.04	2
	403125-R.08-T2-25591	5/16	0.3125	0.3125	0.3543	2.5591	4.50	0.08	1
	403125-R.08-T4-14567	5/16	0.3125	0.3125	0.3543	1.4567	3.50	0.08	2
	403750-R.08-T2-27165	3/8	0.3750	0.3750	0.4331	2.7165	4.50	0.08	1
	403750-R.08-T4-15748	3/8	0.3750	0.3750	0.4331	1.5748	4.00	0.08	2
	405000-R.08-T2-27953	1/2	0.5000	0.5000	0.5118	2.7953	4.50	0.08	1
	405000-R.08-T4-16535	1/2	0.5000	0.5000	0.5118	1.6535	4.50	0.08	2
	406250-R.08-T2-28740	5/8	0.6250	0.6250	0.6693	2.8740	5.00	0.08	1
	406250-R.08-T4-17717	5/8	0.6250	0.6250	0.6693	1.7717	5.00	0.08	2

Endmill series for high speed machining for high hardened steel

H Endmill

- For cutting high hardened and heat-treated steel under HRC70
- New coating technology improves wear resistance
- A new shape improves machinability
- High speed and highly accurate machining available

Features



before

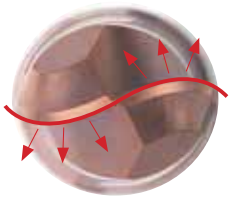
After special edge treatment

■ **New grade(PC303S, PC310U)**
- Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance

■ **Special edge treatment**
- Special cutting edge design was applied for less chipping and longer tool life

■ **High accuracy with tolerance-h5**
- High quality production system enables tolerance-h5 throughout the whole series.

PBE Series (Ball)



Cutting load is dispersed

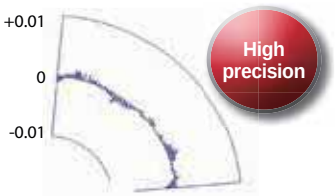
S shape of ball

■The S shape of ball disperses cutting loads
■The tolerance of ball R is under ±0.005mm

PRE Series (Radius)

H Endmill radius

New shape of corner R



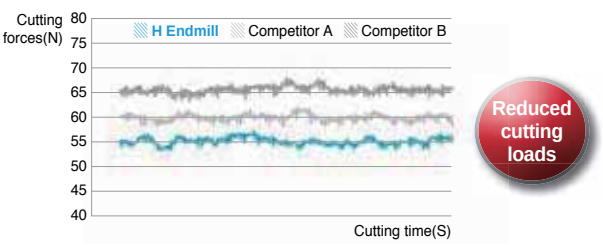
Measurement result of tolerance of corner R

■The new shape of corner R reduces cutting loads
■The tolerance of corner R is under ±0.005mm

■ **Workpiece** D2(AISI) / X100CrMoV5 1(DIN) / SKD11(JIS), HRC60

■ **Cutting conditions** Diameter=Ø8.0, n(min^{-1})=4,000, vc(m/min)=100
vf(mm/min)=800, fz(mm/t)=0.05
ap(mm)=8.0, ae(mm)=0.25, dry

■ **Tools** PRE4080-100-R05



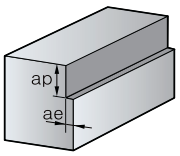
鰯 Special cutting edge design reduces cutting loads and prolongs tool life.

M This is metric size. We can also provide in inch type

Recommended cutting conditions(PRE4000 Radius)

Workpiece / Conditions / Diameter(Ø)	Pre hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
3	17,300	1,250	11,500	840	7,500	256
4	13,200	1,300	8,800	880	5,600	268
5	12,500	1,500	8,300	1,000	5,100	296
6	10,350	1,400	6,900	950	4,200	280
8	7,800	1,350	5,200	900	3,200	264
10	6,150	1,260	4,100	840	2,550	248
12	5,250	1,260	3,500	840	2,100	240

Application tip

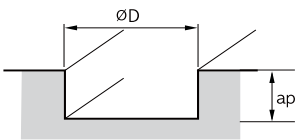


■ Shouldering depth(ap) and radial depth(ae)
- ap = 0.1D
- ae = 0.03D
- Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions(PRE4000 Radius)

Workpiece / Conditions / Diameter(Ø)	Pre hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
3	17,300	544	11,500	336	7,500	128
4	13,200	560	8,800	352	5,600	136
5	12,500	644	8,300	400	5,100	144
6	10,350	616	6,900	384	4,200	144
8	7,800	576	5,200	356	3,200	132
10	6,150	544	4,100	332	2,550	124
12	5,250	544	3,500	332	2,100	124

Application tip

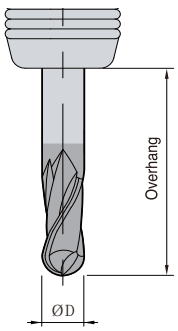


■ Slotting depth(ap)
- ap = 0.05D
- ae = 1.0D
- Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

■ Cutting conditions of the shank taper type in case of being clamped at neck.
鰯 When the overhang is increased by 1D, decrease R.P.M and feed 10%.

■ In case of the straight type adjust conditions according to the overhang.
鰯 Ex) When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%.



Notice

■ Cutting conditions are up to the machine's condition and the shape of cutting.

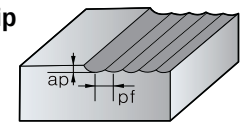
■ Use cutting fluid that is proper to the workpiece and produces few temperature reaction.

M This is metric size. We can also provide in inch type

Recommended cutting conditions (PBE2000 Ball)

Workpiece / Conditions / Diameter(Ø)	Pre hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened Steel (HRC55~HRC70)	
	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)
0.5	35,000	1,470	31,500	1,330	28,000	1,050
1	35,000	2,940	31,500	2,660	28,000	2,000
1.2	33,600	3,010	30,100	2,695	26,600	2,100
1.5	33,600	3,150	30,100	2,800	25,900	2,150
2	33,460	3,360	28,000	2,800	24,500	2,200
2.5	25,900	3,710	22,400	2,800	17,500	2,200
3	22,260	3,710	18,550	2,800	16,500	2,200
4	16,730	3,710	14,000	2,800	13,000	2,200
5	17,800	4,900	15,000	3,750	12,500	2,100
6	13,400	4,100	11,000	3,100	10,000	2,500
8	10,700	3,500	9,000	2,700	8,000	2,150
10	8,900	3,100	7,500	2,400	6,600	1,900
12	6,680	2,500	5,600	1,900	5,000	1,550

Application tip

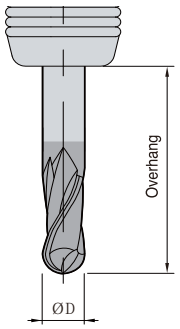


- ap = 0.02D
- pf = 0.05D
- Workpiece should be clamped rigidly. In case of vibration, reduce RPM and feed rate by the same ratio

Cutting condition by overhang

■ Cutting conditions of the shank taper type in case of being clamped at neck.
鰯 When the overhang is increased by 1D, decrease R.P.M and feed 10%.

■ In case of the straight type adjust conditions according to the overhang.
鰯 Ex) When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%.



Notice

■ Cutting conditions are up to the machine's condition and the shape of cutting.
■ Use cutting fluid that is proper to the workpiece and produces few temperature reaction.

Cutting speed formulas (Ball Endmills)

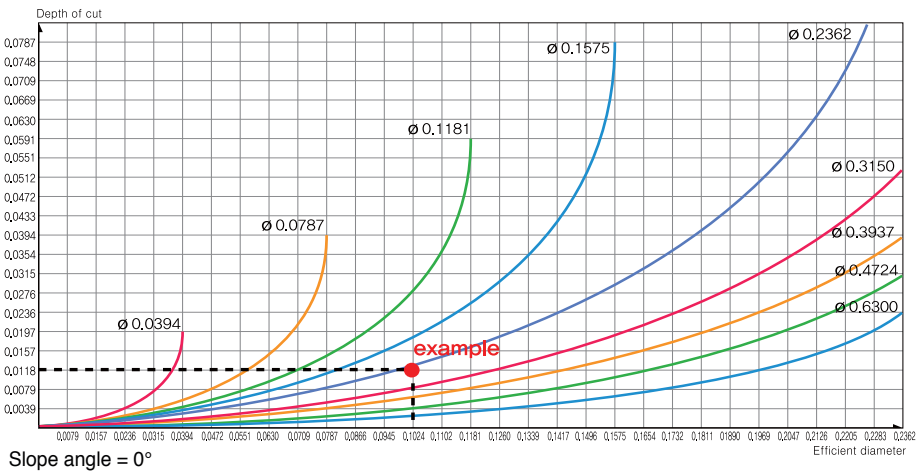
■ Efficient cutting speed Veff = (π × Deff × n)/1000 (n = min^{-1})

■ Efficient diameter Deff calculation formula Deff = ($2\sqrt{ap(D-ap)} \times \alpha$)
D=Ø(Tool diameter), Deff=Efficient diameter

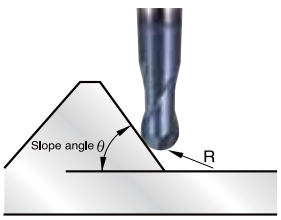
■ Efficient cutting speed formulas : When slope Ø is 0° Veff = (π × Deff × n)/1000
Deff = Efficient, diameter Calculate Deff as ap with various ball endmills

α :	α= 1	Slope angle θ = 0°
	α= 1.2	Slope angle θ = 7°
	α= 1.5	Slope angle θ = 15°
	α= 1.7	Slope angle θ = 30°
	α= 2.17	Slope angle θ = 45°
	α= 2.3	Slope angle θ = 60°

Cutting speed formulas (Ball Endmills, Slope angle = 0°)



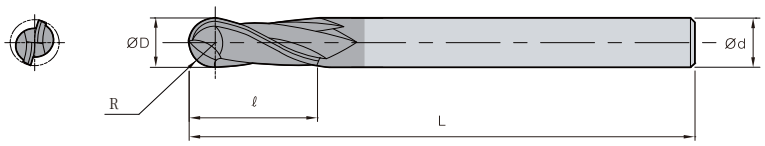
Slope angle = 0°



Ex) **Diameter** : 0.236inch, ap=0.0118inch,
Deff=0.1inch, N=14,000(min-1)
Slope angle 0° : Veff = 373(sfm)
Slope angle 15° :
Veff = 373 x 1.5 = 559.5(sfm)

M This is metric size. We can also provide in inch type

PBE2000 (Ball)



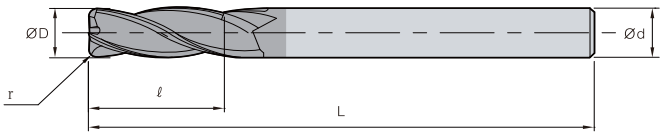
ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

Designation		R	ØD	Ød	ℓ	L
PBE	PBE2005-040	0.25	0.5	6	1	40
2	PBE2010-050	0.5	1	6	2.5	50
	PBE2012-050	0.6	1.2	6	3	50
	PBE2015-050	0.75	1.5	6	4	50
	PBE2020-050	1	2	6	5	50
	PBE2025-060	1.25	2.5	6	7	60
	PBE2030-060	1.5	3	6	8	60
	PBE2040-070	2	4	6	8	70
	PBE2050-080	2.5	5	6	10	80
	PBE2060-090	3	6	6	12	90
	PBE2080-100	4	8	8	14	100
	PBE2100-100	5	10	10	18	100
	PBE2120-110	6	12	12	22	110

M This is metric size. We can also provide in inch type

PRE4000 (Radius)



4 | H·A 30° | h5 shank | Substrate PC310U

ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

Designation		ØD	Ød	ℓ	L	r
PRE	PRE4030-060-R01	3	6	8	60	0.1
4	PRE4030-060-R02	3	6	8	60	0.2
	PRE4030-060-R03	3	6	8	60	0.3
	PRE4030-060-R05	3	6	8	60	0.5
	PRE4040-070-R01	4	6	10	70	0.1
	PRE4040-070-R02	4	6	10	70	0.2
	PRE4040-070-R03	4	6	10	70	0.3
	PRE4040-070-R05	4	6	10	70	0.5
	PRE4040-070-R10	4	6	10	70	1
	PRE4060-090-R02	6	6	15	90	0.2
	PRE4060-090-R03	6	6	15	90	0.3
	PRE4060-090-R05	6	6	15	90	0.5
	PRE4060-090-R10	6	6	15	90	1
	PRE4080-100-R02	8	8	20	100	0.2
	PRE4080-100-R03	8	8	20	100	0.3
	PRE4080-100-R05	8	8	20	100	0.5
	PRE4080-100-R10	8	8	20	100	1
	PRE4100-100-R03	10	10	25	100	0.3
	PRE4100-100-R05	10	10	25	100	0.5
	PRE4100-100-R10	10	10	25	100	1
	PRE4120-110-R03	12	12	30	110	0.3
	PRE4120-110-R05	12	12	30	110	0.5
	PRE4120-110-R10	12	12	30	110	1

M This is metric size. We can also provide in inch type

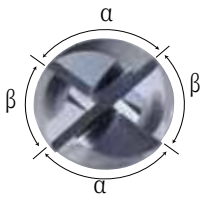
Improved productivity with effective machining due to less vibration

V Endmill

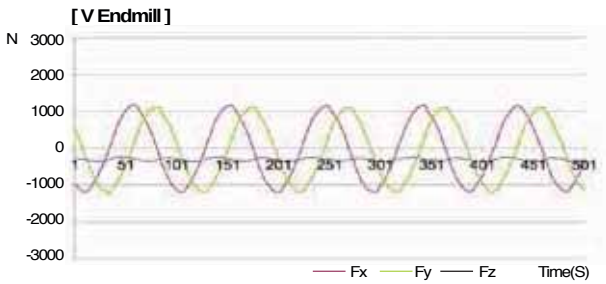
Variable Endmill

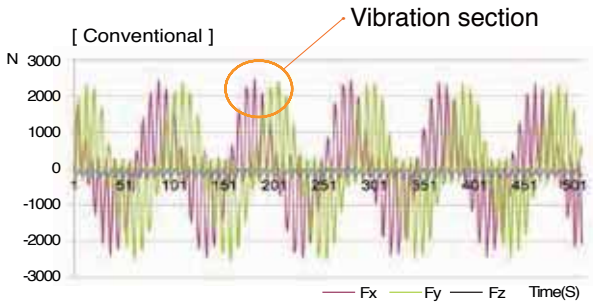
- Irregular helix angle
- Irregular indexing angle

※ Irregular flute spacing : Decreased vibration



Performance(Vibration test)





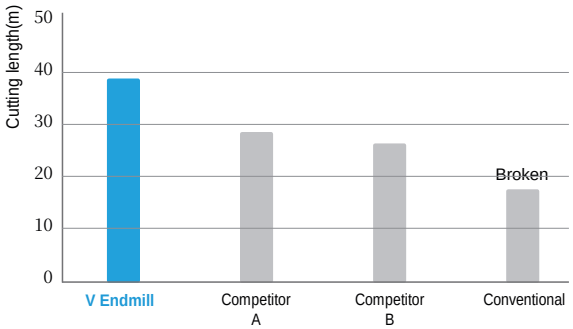
- **Workpiece** Alloy steel
- **Cutting condition** D=Ø8.0, n(min^{-1})=3183, vc(m/min)=80, vf(mm/min)=713, fz(mm/t)=0.055, ap(mm)=8.0, ae(mm)=8.0, Dry
- **Tools** V Endmill VFE4080-060 · Conventional endmill

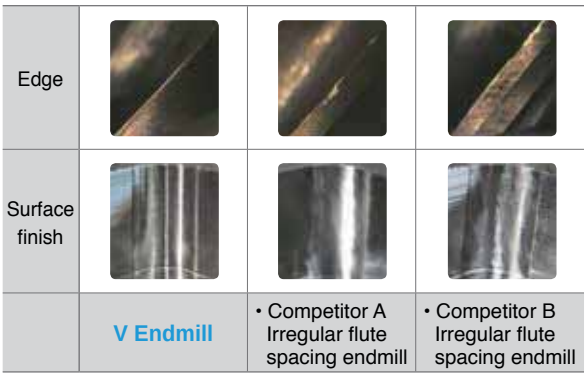
■ Advantage of V Endmill

Type	Cutting speed(vc)	Feed(vf)	Vibration	Quality
V Endmill	30% up	30% up	Minimize	Excellent

· Higher cutting speed and feed rate increase productivity.
· Less vibration realizes excellent surface finish and higher quality machining.

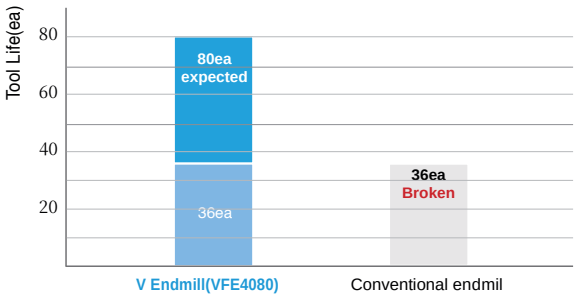
Performance(Surface finish)





- **Workpiece** Stainless steel
- **Cutting condition** D=Ø8.0, n(min^{-1})=3979, vc(m/min)=100, vf(mm/min)=796, fz(mm/t)=0.05, ap(mm)=12, ae(mm)=0.8, Dry
- **Tools** VFE4080-060

Machining example



V Endmill

범용 엔드밀

- **Workpiece** Alloy steel
- **Cutting condition** D=Ø8.0, n(m/min)=6000, vc(m/min)=150, vf(mm/min)=600, fz(mm/t)=0.025, ap(mm)=7, ae(mm)=0.8, Wet(Water-soluble)
- **Tools** VFE4080-060

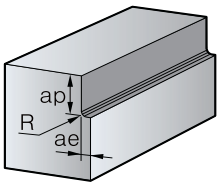
M This is metric size. We can also provide in inch type

Cutting condition

■ Shouldering

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less(SM, SCM)				Mold steel, HRC35~45(STS, KP4M)			
	R.P.M(min^{-1})	Feed(mm/min)	ap(mm)	ae(mm)	R.P.M(min^{-1})	Feed(mm/min)	ap(mm)	ae(mm)
2.5	15,915	1,241	3.8	0.7	12.732	891	3.8	0.3
3.0	13,263	1,241	4.5	0.8	10,610	891	4.5	0.3
3.5	11,368	1,241	5.3	0.9	9,095	891	5.3	0.4
4.0	9,947	1,241	6.0	1.1	7,958	891	6.0	0.4
5.0	7,958	1,241	7.5	1.4	6,366	891	7.5	0.5
6.0	6,631	1,241	9.0	1.6	5,305	891	9.0	0.6
7.0	5,684	1,241	10.5	1.9	4,547	891	10.5	0.7
8.0	4,974	1,194	12.0	2.2	3,979	891	12.0	0.8
9.0	4,421	1,194	13.5	2.4	3,537	891	13.5	0.9
10.0	3,979	1,194	15.0	2.7	3,183	891	15.0	1.0
12.0	3,316	1,194	18.0	3.2	2,653	891	18.0	1.2
14.0	2,842	1,194	21.0	3.8	2,274	891	21.0	1.4
16.0	2,487	1,194	24.0	4.3	1,989	891	24.0	1.6

● **Application tip**



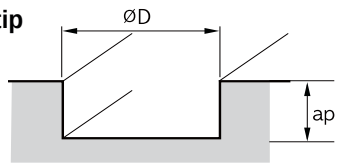
※ Cutting condition by overhang

1. Standard overhang : Follow cutting condition above.
2. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

■ Slotting

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less(SM, SCM)			Mold steel, HRC35~45(STS, KP4M)		
	R.P.M(min^{-1})	Feed(mm/min)	ap(mm)	R.P.M(min^{-1})	Feed(mm/min)	ap(mm)
2.5	15.915	1,035	2.8	12,732	700	2.5
3.0	13,263	1,035	3.3	10,610	700	3.0
3.5	11,268	1,035	3.9	9,095	700	3.5
4.0	9,947	1,035	4.4	7,958	700	4.0
5.0	7,958	1,035	5.5	6,366	700	5.0
6.0	6,631	1,035	6.6	5,305	700	6.0
7.0	5,687	1,035	7.7	4,549	700	7.0
8.0	4,974	1,035	8.8	3,979	700	8.0
9.0	4,421	1,035	9.9	3,537	700	9.0
10.0	3,979	1,035	11.0	3,183	700	10.0
12.0	3,316	1,035	13.2	2,653	700	12.0
14.0	2,842	1,035	15.4	2,274	700	14.0
16.0	2,487	1,035	17.6	1,989	700	16.0

● **Application tip**

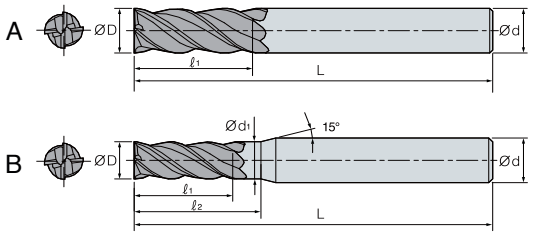


※ Cutting condition by overhang

1. Standard overhang : Follow cutting condition above.
2. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

M This is metric size. We can also provide in inch type

VFE4000 (Flat)



4 | H-A 40°/43° | h6 shank | Substrate PC215F

ØD	Tolerance
Ø3~Ø9	0.00 ~ -0.02
Ø10~Ø16	0.00 ~ -0.03

(mm)

Designation	ØD	Ød	d1	ℓ_1	ℓ_2	L	Type
VFE 4025-045	2.5	6.0	2.48	6.0	8.0	45	B
4030-050	3.0	6.0	2.98	7.0	9.5	50	B
4035-050	3.5	6.0	3.48	8.0	11.0	50	B
4040-050	4.0	6.0	3.98	9.0	12.0	50	B
4050-050	5.0	6.0	4.98	12.0	16.0	50	B
4060-050	6.0	6.0	-	14.0	-	50	A
4070-060	7.0	8.0	6.97	16.0	21.0	60	B
4080-060	8.0	8.0	-	19.0	-	60	A
4090-070	9.0	10.0	8.97	20.0	27.0	70	B
4100-075	10.0	10.0	-	23.0	-	75	A
4120-080	12.0	12.0	-	27.0	-	80	A
4140-085	14.0	14.0	-	31.0	-	85	A
4160-090	16.0	16.0	-	36.0	-	90	A

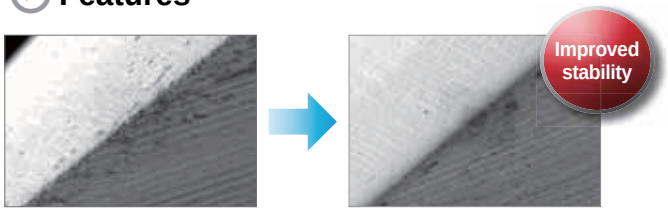
M This is metric size. We can also provide in inch type

Endmill series for general cutting

Z Endmill

- Endmill for general cutting of various workpieces under HRC45 (carbon steel, alloy steel, cast iron, pre hardened steel, etc.)
- New shape and coating improves performance and tool life
- Optimized blade design for less chipping and stable machining

Features



before

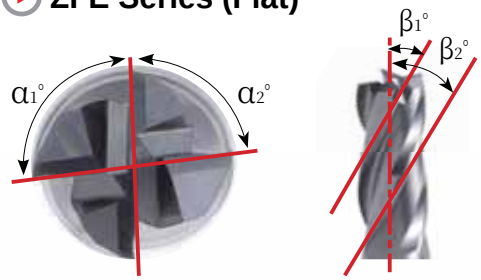
After special edge treatment

■ **New grade(PC315E)**
- Fine substrate and lubricative coating guarantee excellent performance at high speed and high temperature.

■ **Special edge treatment**
- Special cutting edge design was applied for less chipping and longer tool life

■ **High accuracy with tolerance-h5**
- High quality production system enables tolerance-h5 throughout the whole series.

ZFE Series (Flat)



$\alpha_1^\circ \neq \alpha_2^\circ$, $\beta_1^\circ \neq \beta_2^\circ$ Irregular indexing & helix

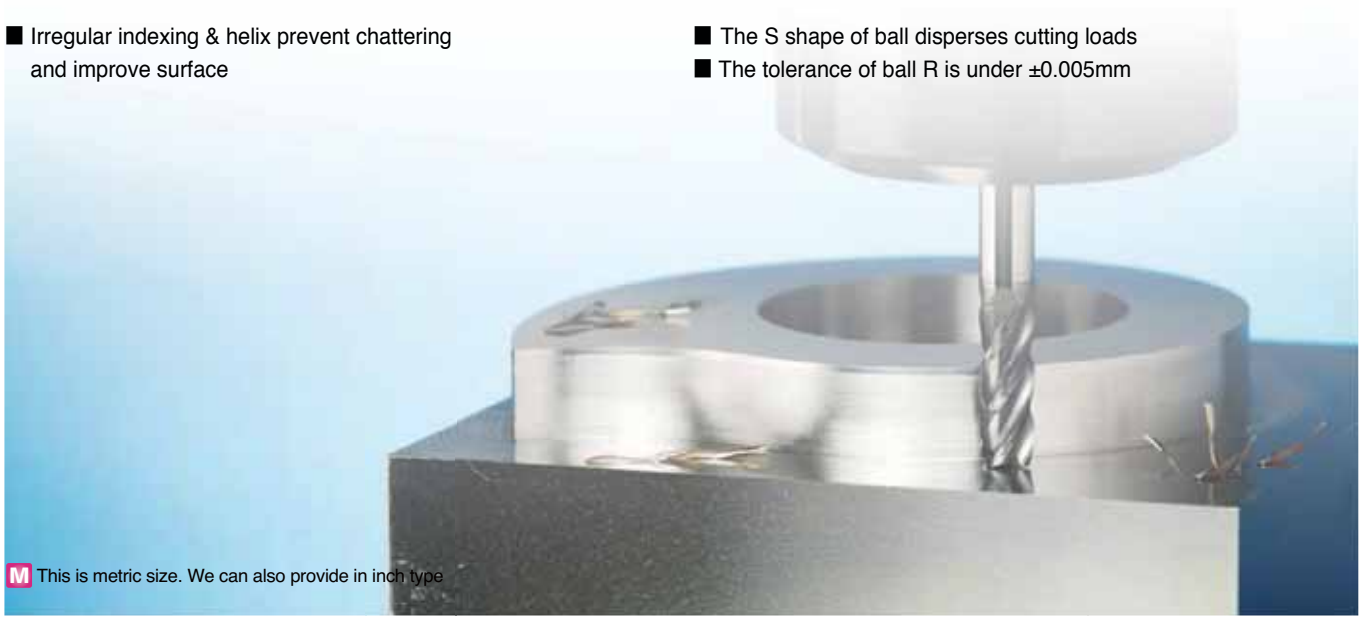
■ Irregular indexing & helix prevent chattering and improve surface

ZBE Series (Ball)

Cutting load is dispersed

S shape of ball

■ The S shape of ball disperses cutting loads
■ The tolerance of ball R is under ±0.005mm



M This is metric size. We can also provide in inch type

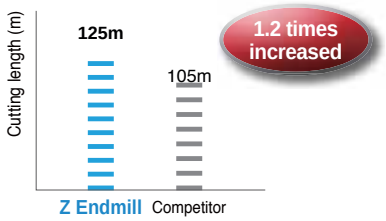
Cutting performance

Carbon steel [1045(AISI) / C45(DIN) / S45C(JIS), HRC20)]

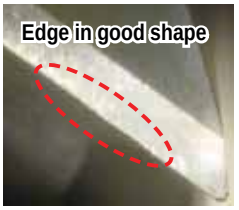
■ **Cutting conditions**
Diameter = Ø8.0
n(min^{-1}) = 7,165
vc(m/min) = 180
vf(mm/min) = 1,433
fz(mm/t) = 0.05
ap(mm) = 8
ae(mm) = 0.8
dry

■ **Tools** ZFE4080-070

■ **Result**



• Cutting edge treatment for less chipping



Z Endmill

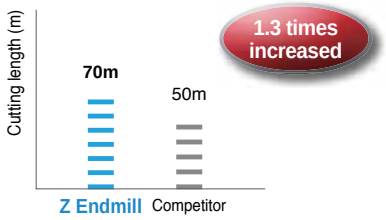

Competitor

Carbon steel [1045(AISI) / C45(DIN) / S45C(JIS), HRC20)]

■ **Cutting conditions**
Diameter = Ø8.0
n(min^{-1}) = 5,175
vc(m/min) = 130
vf(mm/min) = 1,035
fz(mm/t) = 0.1
ap(mm) = 0.5
ae(mm) = 1.6
dry

■ **Tools** ZBE2080-100

■ **Result**



• New grade improves wear resistance

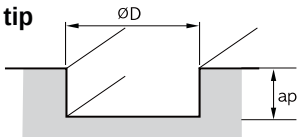
Z Endmill


Competitor

Recommended cutting conditions (ZFE2000 / ZSFE2000 Flat)

Workpiece / Condition / Diameter(Ø)	Alloy steel and carbon steel (under HRC30)		Pre hardened steel (HRC30~45)		Stainless steel	
	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)
1	19,745	175	13,057	100	10,500	70
2	11,560	190	7,560	120	6,300	90
3	8,920	210	5,560	140	4,620	120
4	7,560	300	4,620	180	3,880	150
5	6,300	320	3,780	190	3,160	160
6	5,560	350	3,360	220	2,840	180
8	4,200	380	2,520	200	2,100	180
10	3,260	330	2,000	160	1,680	160
12	2,740	280	1,680	130	1,360	130
16	2,200	220	1,360	110	1,060	110

● **Application tip**



■ **Slotting depth(ap)**

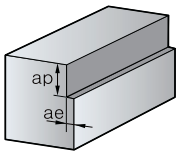
• Ø3 ≥ D (ap 0.2D)
• D > Ø3 (ap 0.5D)
• Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

Recommended cutting conditions (ZFE4000 / ZSFE4000 Flat)

Workpiece / Condition / Diameter(Ø)	Alloy steel and carbon steel (under HRC30)		Pre hardened steel (HRC30~45)		Stainless steel	
	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)
2	11,560	280	7,560	170	6,300	140
3	8,920	320	5,560	200	4,620	170
4	7,560	570	4,620	350	3,880	280
5	6,300	600	3,780	360	3,160	300
6	5,560	660	3,360	410	2,840	330
8	4,200	710	2,520	380	2,100	350
10	3,260	610	2,000	300	1,680	300
12	2,740	520	1,680	250	1,360	240
16	2,200	410	1,360	200	1,100	200

● **Application tip**



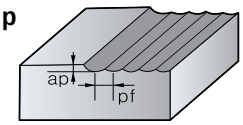
■ **Shouldering depth(ap) and radial depth(ae)**

- ap = 1.0D
- ae = 0.05D
- Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (ZBE2000 Ball)

Workpiece / Condition / Diameter(Ø)	Alloy steel and carbon steel (under HRC30)		Pre hardened steel (HRC30~45)	
	R.P.M n(min^{-1})	Feed vf(mm/min)	R.P.M n(min^{-1})	Feed vf(mm/min)
1	30,000	2,880	30,000	2,520
1.2	30,000	3,060	28,800	2,580
1.5	30,000	3,240	28,800	2,700
2	29,820	3,420	28,680	2,880
3	19,860	3,600	19,080	3,180
4	14,940	3,600	14,340	3,180
5	11,160	3,480	10,680	2,940
6	8,340	2,910	8,040	2,460
8	6,660	2,520	6,420	2,100
10	5,580	2,220	5,340	1,860
12	4,170	1,770	4,008	1,500

● **Application tip**

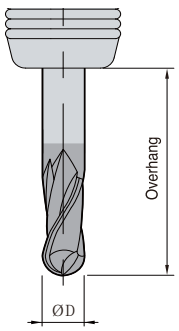


- ap = 0.03D
- pf = 0.05D
- Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

■ Cutting conditions of the shank taper type in case of being clamped at neck.
鰯 When the overhang is increased by 1D, decrease R.P.M and feed 10%.

■ In case of the straight type adjust conditions according to the overhang.
鰯 Ex) When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%.



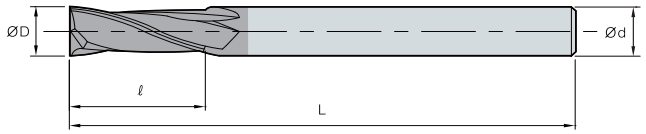
Notice

■ Cutting conditions are up to the machine's condition and the shape of cutting.

■ Use cutting fluid that is proper to the workpiece and produces few temperature reaction.

M This is metric size. We can also provide in inch type

ZFE2000 (Flat)



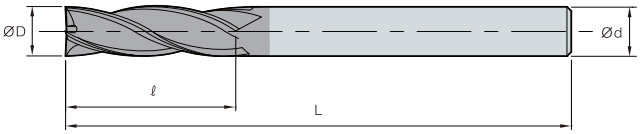
ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

Designation		ØD	Ød	ℓ	L
ZFE	ZFE2010-050-S4	1	4	2.5	50
2	ZFE2010-050-S6	1	6	2.5	50
	ZFE2012-050-S4	1.2	4	3	50
	ZFE2012-050-S6	1.2	6	3	50
	ZFE2015-050-S4	1.5	4	4	50
	ZFE2015-050-S6	1.5	6	4	50
	ZFE2020-050-S4	2	4	6	50
	ZFE2020-050-S6	2	6	6	50
	ZFE2025-050-S4	2.5	4	7.5	50
	ZFE2025-050-S6	2.5	6	7.5	50
	ZFE2030-050-S4	3	4	9	50
	ZFE2030-050-S6	3	6	9	50
	ZFE2035-050	3.5	6	10	50
	ZFE2040-050-S4	4	4	11	50
	ZFE2040-050-S6	4	6	11	50
	ZFE2045-050	4.5	6	14	50
	ZFE2050-060	5	6	15	60
	ZFE2055-060	5.5	6	15	60
	ZFE2060-060	6	6	15	60
	ZFE2065-060	6.5	8	18	60
	ZFE2070-060	7	8	20	60
	ZFE2075-060	7.5	8	20	60
	ZFE2080-070	8	8	20	70
	ZFE2085-070	8.5	10	22	70
	ZFE2090-070	9	10	22	70
	ZFE2095-070	9.5	10	24	70
	ZFE2100-075	10	10	25	75
	ZFE2120-080	12	12	30	80
	ZFE2140-100	14	14	35	100
	ZFE2160-100	16	16	40	100

M This is metric size. We can also provide in inch type

ZFE4000 (Flat)



4 | Multiple H·A | h5 shank | Substrate PC315E

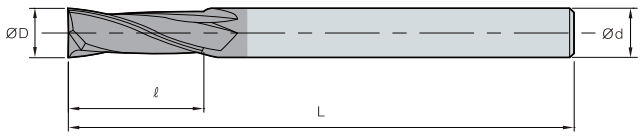
ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

Designation		ØD	Ød	ℓ	L
ZFE	ZFE4010-050-S4	1	4	2.5	50
4	ZFE4010-050-S6	1	6	2.5	50
	ZFE4012-050-S4	1.2	4	3	50
	ZFE4012-050-S6	1.2	6	3	50
	ZFE4015-050-S4	1.5	4	4	50
	ZFE4015-050-S6	1.5	6	4	50
	ZFE4020-050-S4	2	4	6	50
	ZFE4020-050-S6	2	6	6	50
	ZFE4025-050-S4	2.5	4	7.5	50
	ZFE4025-050-S6	2.5	6	7.5	50
	ZFE4030-050-S4	3	4	9	50
	ZFE4030-050-S6	3	6	9	50
	ZFE4035-050	3.5	6	10	50
	ZFE4040-050-S4	4	4	11	50
	ZFE4040-050-S6	4	6	11	50
	ZFE4045-050	4.5	6	14	50
	ZFE4050-060	5	6	15	60
	ZFE4055-060	5.5	6	15	60
	ZFE4060-060	6	6	15	60
	ZFE4065-060	6.5	8	18	60
	ZFE4070-060	7	8	20	60
	ZFE4075-060	7.5	8	20	60
	ZFE4080-070	8	8	20	70
	ZFE4085-070	8.5	10	22	70
	ZFE4090-070	9	10	22	70
	ZFE4095-070	9.5	10	24	70
	ZFE4100-075	10	10	25	75
	ZFE4120-080	12	12	30	80
	ZFE4140-100	14	14	35	100
	ZFE4160-100	16	16	40	100

M This is metric size. We can also provide in inch type

ZSFE2000/4000 (Short Flat)



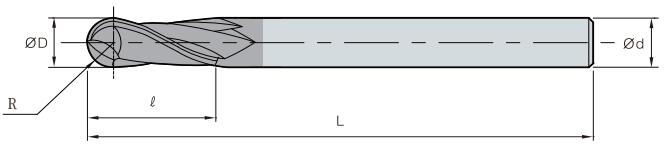
ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

Designation		ØD	Ød	ℓ	L
ZSFE 2	ZSFE2010-040-S4	1	4	1.5	40
	ZSFE2010-040-S6	1	6	1.5	40
	ZSFE2012-040-S4	1.2	4	1.5	40
	ZSFE2012-040-S6	1.2	6	1.5	40
	ZSFE2015-040-S4	1.5	4	2.2	40
	ZSFE2015-040-S6	1.5	6	2.2	40
	ZSFE2020-040-S4	2	4	3	40
	ZSFE2020-040-S6	2	6	3	40
	ZSFE2025-040-S4	2.5	4	4	40
	ZSFE2025-040-S6	2.5	6	4	40
	ZSFE2030-045-S4	3	4	4.5	45
	ZSFE2030-045-S6	3	6	4.5	45
	ZSFE2040-045-S4	4	4	6	45
	ZSFE2040-045-S6	4	6	6	45
	ZSFE2060-050	6	6	9	50
	ZSFE2080-060	8	8	12	60
	ZSFE2100-065	10	10	15	65
	ZSFE2120-070	12	12	18	70
ZSFE 4	ZSFE4010-040-S4	1	4	1.5	40
	ZSFE4010-040-S6	1	6	1.5	40
	ZSFE4012-040-S4	1.2	4	1.5	40
	ZSFE4012-040-S6	1.2	6	1.5	40
	ZSFE4015-040-S4	1.5	4	2.2	40
	ZSFE4015-040-S6	1.5	6	2.2	40
	ZSFE4020-040-S4	2	4	3	40
	ZSFE4020-040-S6	2	6	3	40
	ZSFE4025-040-S4	2.5	4	4	40
	ZSFE4025-040-S6	2.5	6	4	40
	ZSFE4030-045-S4	3	4	4.5	45
	ZSFE4030-045-S6	3	6	4.5	45
	ZSFE4040-045-S4	4	4	6	45
	ZSFE4040-045-S6	4	6	6	45
	ZSFE4060-050	6	6	9	50
	ZSFE4080-060	8	8	12	60
	ZSFE4100-065	10	10	15	65
	ZSFE4120-070	12	12	18	70

M This is metric size. We can also provide in inch type

ZBE2000 (Ball)




ØD	Tolerance
~ Ø5.9	0.00 ~ -0.015
Ø6.0 ~	0.00 ~ -0.025

(mm)

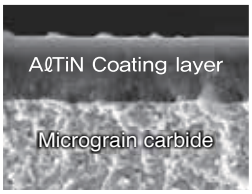
Designation		R	ØD	Ød	ℓ	L
ZBE	ZBE2010-050-S4	0.5	1	4	2.5	50
	ZBE2010-050-S6	0.5	1	6	2.5	50
	ZBE2012-050-S4	0.6	1.2	4	3	50
	ZBE2012-050-S6	0.6	1.2	6	3	50
	ZBE2015-050-S4	0.75	1.5	4	4	50
	ZBE2015-050-S6	0.75	1.5	6	4	50
	ZBE2020-050-S4	1	2	4	5	50
	ZBE2020-050-S6	1	2	6	5	50
	ZBE2025-060-S4	1.25	2.5	4	6	60
	ZBE2025-060-S6	1.25	2.5	6	6	60
	ZBE2030-060-S4	1.5	3	4	8	60
	ZBE2030-060-S6	1.5	3	6	8	60
	ZBE2035-070	1.75	3.5	6	8	70
	ZBE2040-070-S4	2	4	4	8	70
	ZBE2040-070-S6	2	4	6	8	70
	ZBE2045-080	2.25	4.5	6	9	80
	ZBE2050-080	2.5	5	6	10	80
	ZBE2055-090	2.75	5.5	6	11	90
	ZBE2060-090	3	6	6	12	90
	ZBE2065-090	3.25	6.5	8	13	90
	ZBE2070-090	3.5	7	8	14	90
	ZBE2080-100	4	8	8	14	100
	ZBE2085-100	4.25	8.5	10	16	100
	ZBE2090-100	4.5	9	10	18	100
	ZBE2100-100	5	10	10	18	100
	ZBE2120-110	6	12	12	22	110

M This is metric size. We can also provide in inch type

Stable performance guaranteed for workpiece which is under HRC45

I+ Endmill New

- Tough substrate & wear-resisting coating technology applied
- Wide application range in general use
  - Stable performance guaranteed for workpiece which is under 45 HRC
- Saving cost by higher productivity

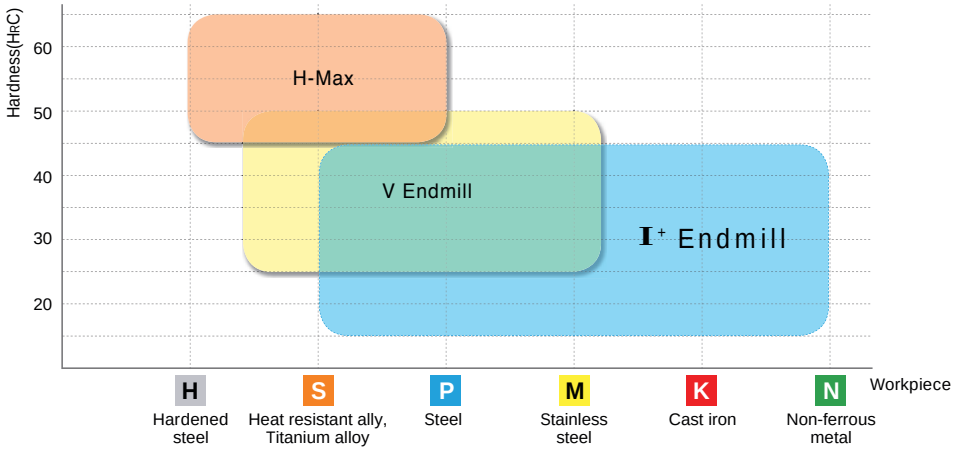


PC320

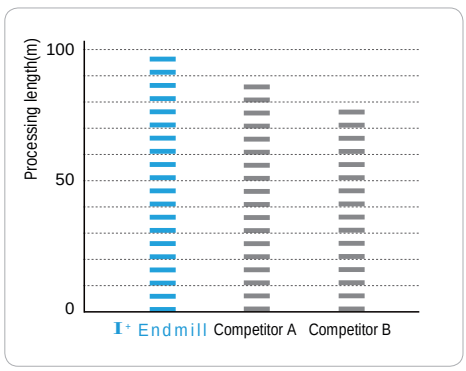
Product line-up

- IPBE : I Plus Ball Endmill (Ø1~Ø20)
- IPFE : I Plus Flat Endmill (Ø1~Ø20)
- IPRE : I Plus Radius Endmill (Ø1~Ø12)

Application area



Comparison



I+ Endmill | Competitor A | Competitor B

- **Workpiece** : SM45C
- **Curring condition** : Cutting Diameter=Ø8.0 n(min-1)=5173 vc(m/min)=130.0 vf(mm/min)=1034 fz(mm/t)=0.1
  ap(mm)=0.5 ae(mm)=1.6 Dry
- **Tool** : IPBE2080-060

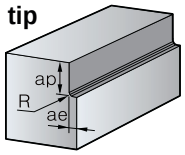
M This is metric size. We can also provide in inch type

Recommended Cutting Condition (Flat)

■ IPFE2000

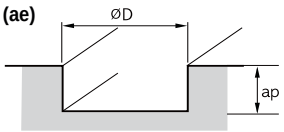
Diameter (ØD)	Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	600	480	20,000	400	320	12,600	300	180
1.5	20,000	600	480	14,000	400	320	8,400	300	180
2.0	15,000	600	480	10,000	400	400	6,300	300	180
2.5	12,000	600	480	8,200	400	320	5,100	300	180
3.0	10,000	600	480	7,000	400	320	4,200	300	180
4.0	7,500	600	480	5,200	400	320	3,100	300	180
5.0	6,000	600	480	4,200	400	320	2,500	300	180
6.0	5,000	600	480	3,500	400	320	2,100	300	180
8.0	4,000	520	410	2,800	350	280	1,600	260	150
10.0	3,200	450	360	2,200	300	240	1,300	230	130
12.0	2,700	410	320	1,900	270	210	1,100	210	120
16.0	2,000	240	190	1,400	210	160	840	160	100
20.0	1,600	200	160	1,100	170	130	680	140	80

● **Application tip**



■ **Shouldering depth (ap) and radial depth (ae)**

- ap : ≤0.1D (D≤Ø3)
  ≤0.2D (D>Ø3)
- ae : ≤0.1D (D≤Ø2)
  ≤0.2D (D>Ø2)



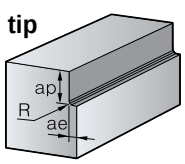
■ **Slotting depth(ap)**

- ap : ≤0.1D (D≤Ø2)
  ≤0.2D (D>Ø2)

■ IPFE4000

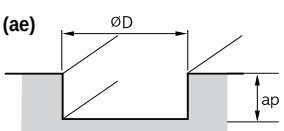
Diameter (ØD)	Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	900	720	20,000	600	480	12,600	450	270
1.5	20,000	900	720	14,000	600	480	8,400	450	270
2.0	15,000	900	720	10,000	600	480	6,300	450	270
2.5	12,000	900	720	8,200	600	480	5,100	450	270
3.0	10,000	900	720	7,000	600	480	4,200	450	270
4.0	7,500	900	720	5,200	600	480	3,100	450	270
5.0	6,000	900	720	4,200	600	480	2,500	450	270
6.0	5,000	900	720	3,500	600	480	2,100	450	270
8.0	4,000	780	620	2,800	520	410	1,600	390	230
10.0	3,200	680	540	2,200	450	360	1,300	340	200
12.0	2,700	620	490	1,900	410	320	1,100	310	180
16.0	2,000	360	280	1,400	310	240	840	240	140
20.0	1,600	300	240	1,100	250	200	680	210	120

● **Application tip**



■ **Shouldering depth (ap) and radial depth (ae)**

- ap : ≤1.5D(All diameter)
- ae : ≤0.1D (D≤Ø3)
  ≤0.2D (D>Ø3)



■ **Slotting depth(ap)**

- ap : ≤0.1D (D≤Ø2)
  ≤0.2D (D>Ø2)

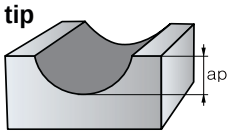
M This is metric size. We can also provide in inch type

Recommended Cutting Condition (Ball)

■ **IPBE2000**

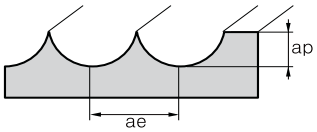
Diameter (ØD)	Carbon steel (SM50C)		Alloy steel (SCM, STD, STS, KP4M, NAK)		Mold steel ~HRC45 (STD61)		Non-ferrous metal (Aluminum)	
	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)
1.0	40,000	1,200	38,000	1,200	29,000	900	40,000	1,000
1.5	30,000	1,270	25,500	1,100	19,000	700	40,000	1,360
2.0	24,000	1,160	19,000	800	14,300	600	40,000	2,000
2.5	19,000	1,000	15,300	670	11,500	510	38,000	2,400
3.0	16,000	930	13,000	600	9,600	460	32,000	2,400
3.5	13,700	930	11,400	580	8,200	450	27,300	2,400
4.0	12,000	930	10,000	570	7,200	450	24,000	2,400
5.0	9,600	930	8,000	560	5,700	450	19,000	2,400
6.0	8,000	930	6,400	540	4,800	450	16,000	2,400
8.0	6,000	900	4,800	540	3,600	450	12,000	2,400
10.0	4,800	900	3,800	540	2,900	450	9,600	2,300
12.0	4,000	900	3,200	540	2,400	450	8,000	2,100
14.0	3,400	900	2,750	540	2,050	450	6,800	2,000
16.0	3,000	900	2,400	540	1,800	450	6,000	2,000
20.0	2,400	900	1,900	520	1,450	450	4,800	2,000

● **Application tip**



■ **Slotting depth(ap)**

• ap : 0.1×R(~45HRC)
0.08×R(~50HRC)



(R0.1~0.5=0.2×R)
0.3×R

■ **Shouldering depth (ap) and radial depth (ae)**

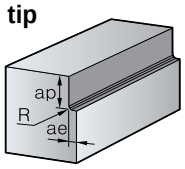
~0.16×R R≤0.3(~45HRC)
~0.25×R R≤3 (~45HRC)
~0.17×R R≤4 (~45HRC)
~0.05×R (~50HRC)

Recommended Cutting Condition (Radius)

■ **IPRE2000**

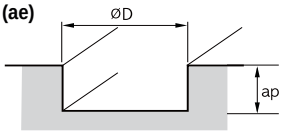
Diameter (ØD)	Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
2.0	11,000	180	180	7,200	110	110	6,000	90	90
3.0	8,500	200	160	5,300	130	100	4,400	110	66
4.0	7,200	360	290	4,400	220	180	3,000	180	110
5.0	6,000	380	300	3,600	230	180	2,400	190	110
6.0	5,300	420	340	3,200	240	190	2,200	210	130
8.0	4,000	450	360	2,400	240	190	1,600	220	130
10.0	3,200	390	310	1,900	190	150	1,300	190	110
12.0	2,700	330	260	1,600	160	130	1,000	150	90

● **Application tip**



■ **Shouldering depth (ap) and radial depth (ae)**

• ap : ≤1.5D
• ap : ≤0.1D

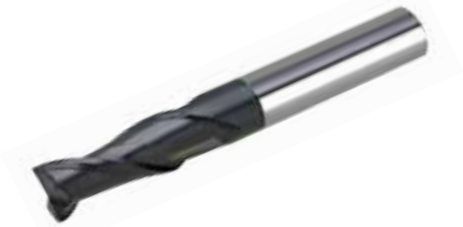


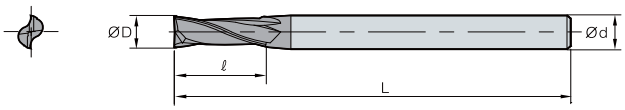
■ **Slotting depth(ap)**

• ap : ≤0.3D

M This is metric size. We can also provide in inch type

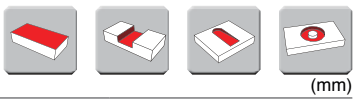
IPFE2000(Standard Flat)





2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

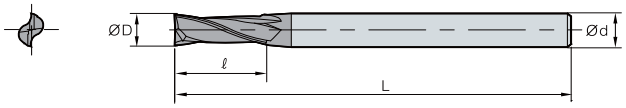


(mm)

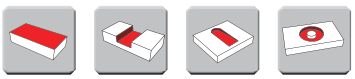
Designation		ØD	Ød	ℓ	L
IPFE 2	2010-050-S3	1	3	3	50
	2010-050-S4	1	4	3	50
	2010-050	1	6	3	50
	2015-050-S3	1.5	3	4	50
	2015-050-S4	1.5	4	4	50
	2015-050	1.5	6	4	50
	2020-050-S3	2	3	6	50
	2020-050-S4	2	4	6	50
	2020-050	2	6	6	50
	2025-050-S3	2.5	3	8	50
	2025-050-S4	2.5	4	8	50
	2025-050	2.5	6	8	50
	2030-050-S3	3	3	8	50
	2030-050-S4	3	4	8	50
	2030-050	3	6	8	50
	2035-050-S4	3.5	4	10	50
	2035-050	3.5	6	10	50
	2040-050-S4	4	4	11	50
	2040-050	4	6	11	50
	2045-050	4.5	6	13	50
	2050-050	5	6	13	50
	2055-050	5.5	6	13	50
	2060-050	6	6	16	50
	2065-060	6.5	8	16	60
	2070-060	7	8	16	60
	2075-060	7.5	8	19	60
	2080-060	8	8	20	60
	2085-075	8.5	10	20	75
	2090-075	9	10	20	75
	2095-075	9.5	10	25	75
	2100-075	10	10	25	75
	2105-075	10.5	12	25	75
	2110-075	11	12	30	75
	2115-075	11.5	12	30	75
	2120-075	12	12	32	75
	2140-100	14	16	40	100
	2160-100	16	16	40	100
	2180-100	18	20	45	100
	2200-100	20	20	45	100

M This is metric size. We can also provide in inch type

IPLFE2000 (Long Flat)



ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03



Long Shank Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE	2060-075	6	6	16	75
2	2060-100	6	6	16	100
	2080-075	8	8	20	75
	2080-100	8	8	20	100
	2100-100	10	10	25	100
	2100-150	10	10	25	150
	2120-100	12	12	32	100
	2120-150	12	12	32	150

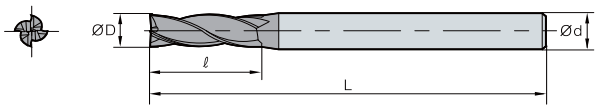
Long Flute Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE	2010-050-V7S4	1	4	7	50
2	2015-050-V9S4	1.5	4	9	50
	2020-050-V12S4	2	4	12	50
	2025-050-V12S4	2.5	4	12	50
	2030-060-V15S6	3	6	15	60
	2035-060-V15S6	3.5	6	15	60
	2040-075-V20S6	4	6	20	75
	2045-075-V20S6	4.5	6	20	75
	2050-075-V25S6	5	6	25	75
	2055-075-V25S6	5.5	6	25	75
	2060-075-V30S6	6	6	30	75
	2070-100-V30S8	7	8	30	100
	2080-100-V40S8	8	8	40	100
	2090-100-V40S10	9	10	40	100
	2100-100-V40S10	10	10	40	100
	2110-100-V40S12	11	12	40	100
	2120-100-V50S12	12	12	50	100
	2140-150-V50S16	14	16	50	150
	2160-150-V60S16	16	16	60	150
	2200-200-V90S20	20	20	90	200

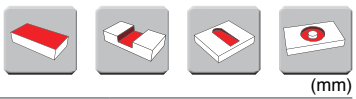
M This is metric size. We can also provide in inch type

IPFE4000 (Standard Flat)



4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

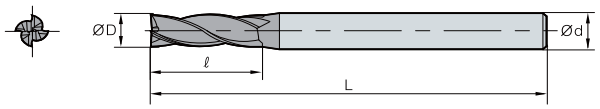


(mm)

Designation		ØD	Ød	ℓ	L
IPFE	4010-050-S3	1	3	3	50
4	4010-050-S4	1	4	3	50
	4010-050	1	6	3	50
	4015-050-S3	1.5	3	4	50
	4015-050-S4	1.5	4	4	50
	4015-050	1.5	6	4	50
	4020-050-S3	2	3	6	50
	4020-050-S4	2	4	6	50
	4020-050	2	6	6	50
	4025-050-S3	2.5	3	8	50
	4025-050-S4	2.5	4	8	50
	4025-050	2.5	6	8	50
	4030-050-S3	3	3	8	50
	4030-050-S4	3	4	8	50
	4030-050	3	6	8	50
	4035-050-S4	3.5	4	10	50
	4035-050	3.5	6	10	50
	4040-050-S4	4	4	11	50
	4040-050	4	6	11	50
	4045-050	4.5	6	13	50
	4050-050	5	6	13	50
	4055-050	5.5	6	13	50
	4060-050	6	6	16	50
	4065-060	6.5	8	16	60
	4070-060	7	8	16	60
	4075-060	7.5	8	19	60
	4080-060	8	8	20	60
	4085-075	8.5	10	20	75
	4090-075	9	10	20	75
	4095-075	9.5	10	25	75
	4100-075	10	10	30	75
	4105-075	10.5	12	30	75
	4110-075	11	12	30	75
	4115-075	11.5	12	30	75
	4120-075	12	12	32	75
	4140-100	14	16	40	100
	4160-100	16	16	40	100
	4180-100	18	20	45	100
	4200-100	20	20	45	100

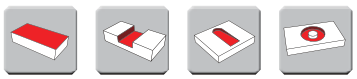
M This is metric size. We can also provide in inch type

IPLFE4000 (Long Flat)



4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03



Long Shank Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4060-075	6	6	16	75
	4060-100	6	6	16	100
	4080-075	8	8	20	75
	4080-100	8	8	20	100
	4100-100	10	10	30	100
	4100-150	10	10	30	150
	4120-100	12	12	32	100
	4120-150	12	12	32	150

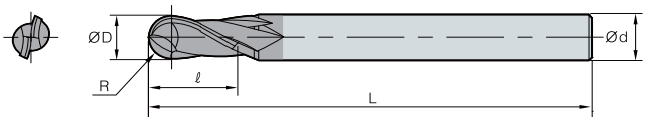
Long Flute Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4010-050-V6S4	1	4	6	50
	4015-050-V9S4	1.5	4	9	50
	4020-050-V12S4	2	4	12	50
	4025-050-V12S4	2.5	4	12	50
	4030-060-V15S6	3	6	15	60
	4035-060-V15S6	3.5	6	15	60
	4040-075-V20S6	4	6	20	75
	4045-075-V20S6	4.5	6	20	75
	4050-075-V25S6	5	6	25	75
	4055-075-V25S6	5.5	6	25	75
	4060-075-V30S6	6	6	30	75
	4070-100-V30S8	7	8	30	100
	4080-100-V40S8	8	8	40	100
	4090-100-V40S10	9	10	40	100
	4100-100-V40S10	10	10	40	100
	4110-100-V40S12	11	12	40	100
	4120-100-V50S12	12	12	50	100
	4140-150-V50S16	14	16	50	150
	4160-150-V60S16	16	16	60	150
	4200-200-V90S20	20	20	90	200

M This is metric size. We can also provide in inch type

IPBE2000 (Standard Ball)



2 | H A 35° | Substrate PC320 | h6 shank

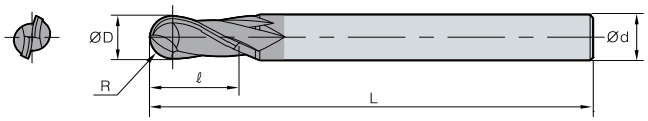
ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE 2	2010-050-S3	0.5	1	3	2	50
	2010-050-S4	0.5	1	4	2	50
	2010-050	0.5	1	6	2	50
	2015-050-S3	0.75	1.5	3	3	50
	2015-050-S4	0.75	1.5	4	3	50
	2015-050	0.75	1.5	6	3	50
	2020-050-S3	1	2	3	4	50
	2020-050-S4	1	2	4	4	50
	2020-050	1	2	6	4	50
	2025-050-S3	1.25	2.5	3	5	50
	2025-050-S4	1.25	2.5	4	5	50
	2025-050	1.25	2.5	6	5	50
	2030-050-S3	1.5	3	3	6	50
	2030-050-S4	1.5	3	4	6	50
	2030-050	1.5	3	6	6	50
	2035-050-S4	1.75	3.5	4	7	50
	2035-050	1.75	3.5	6	7	50
	2040-050-S4	2	4	4	8	50
	2040-050	2	4	6	8	50
	2045-050	2.25	4.5	6	9	50
	2050-050	2.5	5	6	10	50
	2060-050	3	6	6	12	50
	2070-060	3.5	7	8	14	60
	2080-060	4	8	8	16	60
	2090-075	4.5	9	10	18	75
	2100-075	5	10	10	20	75
	2120-075	6	12	12	24	75
	2140-100	7	14	16	28	100
	2160-100	8	16	16	32	100
	2180-100	9	18	20	36	100
	2200-100	10	20	20	40	100

M This is metric size. We can also provide in inch type

IPLBE2000 (Long Ball)



2 | H A 35° | Substrate PC320 | h6 shank

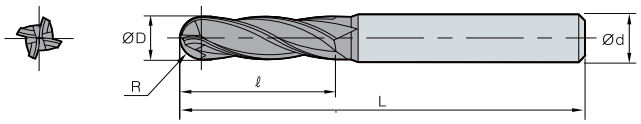
ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø16	0.00 ~ -0.03

(mm)

Designation		R	ØD	Ød	ℓ	L
IPLBE 2	2010-075	0.5	1	6	2	75
	2010-100	0.5	1	6	2	100
	2015-075	0.75	1.5	6	3	75
	2015-100	0.75	1.5	6	3	100
	2020-075	1	2	6	4	75
	2020-100	1	2	6	4	100
	2025-075	1.25	2.5	6	5	75
	2025-100	1.25	2.5	6	5	100
	2030-075	1.5	3	6	6	75
	2030-100	1.5	3	6	6	100
	2035-100	1.75	3.5	6	7	100
	2040-075	2	4	6	8	75
	2040-100	2	4	6	8	100
	2050-075	2.5	5	6	10	75
	2050-100	2.5	5	6	10	100
	2060-075	3	6	6	12	75
	2060-100	3	6	6	12	100
	2060-150	3	6	6	12	150
	2080-075	4	8	8	16	75
	2080-100	4	8	8	16	100
	2080-150	4	8	8	16	150
	2100-100	5	10	10	20	100
	2100-150	5	10	10	20	150
	2100-200	5	10	10	20	200
	2120-100	6	12	12	24	100
	2120-150	6	12	12	24	150
	2120-200	6	12	12	24	200
	2160-150	8	16	16	32	150
	2160-200	8	16	16	32	200

M This is metric size. We can also provide in inch type

IPBE4000 (Standard Ball)



4 | H A 35° | Substrate PC320 | h6 shank

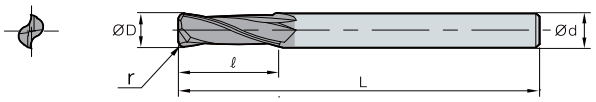
ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

(mm)

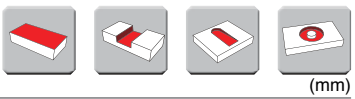
Designation		R	ØD	Ød	ℓ	L
IPBE	4010-050-S4	0.5	1	4	2	50
4	4010-050	0.5	1	6	2	50
	4015-050-S4	0.75	1.5	4	3	50
	4015-050	0.75	1.5	6	3	50
	4020-050-S4	1	2	4	4	50
	4020-050	1	2	6	4	50
	4025-050-S4	1.25	2.5	4	5	50
	4025-050	1.25	2.5	6	5	50
	4030-050-S3	1.5	3	3	6	50
	4030-050-S4	1.5	3	4	6	50
	4030-050	1.5	3	6	6	50
	4035-050-S4	1.75	3.5	4	7	50
	4035-050	1.75	3.5	6	7	50
	4040-050-S4	2	4	4	8	50
	4040-050	2	4	6	8	50
	4045-050	2.25	4.5	6	9	50
	4050-050	2.5	5	6	10	50
	4060-050	3	6	6	12	50
	4070-060	3.5	7	8	14	60
	4080-060	4	8	8	16	60
	4090-075	4.5	9	10	18	75
	4100-075	5	10	10	20	75
	4120-075	6	12	12	24	75
	4140-100	7	14	16	28	100
	4160-100	8	16	16	32	100
	4180-100	9	18	20	36	100
	4200-100	10	20	20	40	100

M This is metric size. We can also provide in inch type

IPRE2000 (Standard Radius)




ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

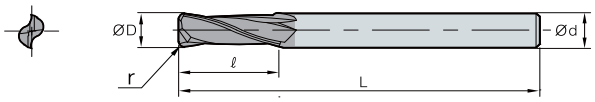


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE	2010-050-R01	1	4	3	50	0.1
	2010-050-R02	1	4	3	50	0.2
	2010-050-R03	1	4	3	50	0.3
	2015-050-R02	1.5	4	4	50	0.2
	2015-050-R03	1.5	4	4	50	0.3
	2020-050-R02	2	4	6	50	0.2
	2020-050-R03	2	4	6	50	0.3
	2020-050-R05	2	4	6	50	0.5
	2025-050-R02	2.5	4	8	50	0.2
	2030-050-R02-S3	3	3	8	50	0.2
	2030-050-R03-S3	3	3	8	50	0.3
	2030-050-R05-S3	3	3	8	50	0.5
	2030-050-R10-S3	3	3	8	50	1
	2030-050-R02	3	4	8	50	0.2
	2030-050-R03	3	4	8	50	0.3
	2030-050-R05	3	4	8	50	0.5
	2030-050-R10	3	4	8	50	1
	2040-050-R02	4	4	10	50	0.2
	2040-050-R03	4	4	10	50	0.3
	2040-050-R05	4	4	10	50	0.5
	2040-050-R10	4	4	10	50	1
	2040-050-R15	4	4	10	50	1.5
	2050-050-R02	5	6	13	50	0.2
	2050-050-R03	5	6	13	50	0.3
	2050-050-R05	5	6	13	50	0.5
	2050-050-R10	5	6	13	50	1
	2060-050-R02	6	6	15	50	0.2
	2060-050-R03	6	6	15	50	0.3
	2060-050-R05	6	6	15	50	0.5
	2060-050-R10	6	6	15	50	1
	2060-050-R15	6	6	15	50	1.5
	2060-050-R20	6	6	15	50	2

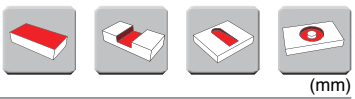
M This is metric size. We can also provide in inch type

IPRE2000 (Standard Radius)



2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

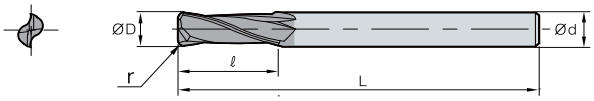


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE	2080-060-R03	8	8	20	60	0.3
2	2080-060-R05	8	8	20	60	0.5
	2080-060-R10	8	8	20	60	1
	2080-060-R15	8	8	20	60	1.5
	2080-060-R20	8	8	20	60	2
	2080-060-R25	8	8	20	60	2.5
	2080-060-R30	8	8	20	60	3
	2100-075-R03	10	10	25	75	0.3
	2100-075-R05	10	10	25	75	0.5
	2100-075-R10	10	10	25	75	1
	2100-075-R15	10	10	25	75	1.5
	2100-075-R20	10	10	25	75	2
	2100-075-R25	10	10	25	75	2.5
	2100-075-R30	10	10	25	75	3
	2120-075-R03	12	12	30	75	0.3
	2120-075-R05	12	12	30	75	0.5
	2120-075-R10	12	12	30	75	1
	2120-075-R15	12	12	30	75	1.5
	2120-075-R20	12	12	30	75	2
	2120-075-R25	12	12	30	75	2.5
	2120-075-R30	12	12	30	75	3

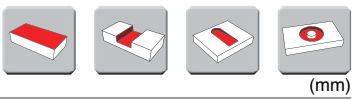
M This is metric size. We can also provide in inch type

IPLRE2000 (Long Radius)



2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø3~Ø12	0.00 ~ -0.02

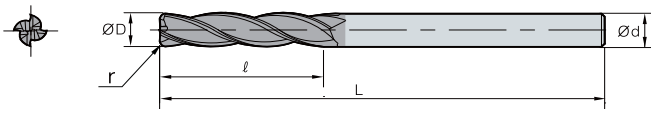


(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 2	2030-075-R03	3	3	8	75	0.3
	2030-075-R05	3	3	8	75	0.5
	2030-075-R10	3	3	8	75	1
	2040-075-R03	4	4	10	75	0.3
	2040-075-R05	4	4	10	75	0.5
	2040-075-R10	4	4	10	75	1
	2040-075-R15	4	4	10	75	1.5
	2060-100-R03	6	6	15	100	0.3
	2060-100-R05	6	6	15	100	0.5
	2060-100-R10	6	6	15	100	1
	2060-100-R15	6	6	15	100	1.5
	2060-100-R20	6	6	15	100	2
	2080-100-R03	8	8	20	100	0.3
	2080-100-R05	8	8	20	100	0.5
	2080-100-R10	8	8	20	100	1
	2080-100-R15	8	8	20	100	1.5
	2080-100-R20	8	8	20	100	2
	2080-100-R25	8	8	20	100	2.5
	2080-100-R30	8	8	20	100	3
	2100-100-R03	10	10	25	100	0.3
	2100-100-R05	10	10	25	100	0.5
	2100-100-R10	10	10	25	100	1
	2100-100-R15	10	10	25	100	1.5
	2100-100-R20	10	10	25	100	2
	2100-100-R25	10	10	25	100	2.5
	2100-100-R30	10	10	25	100	3
	2120-100-R03	12	12	30	100	0.3
	2120-100-R05	12	12	30	100	0.5
	2120-100-R10	12	12	30	100	1
	2120-100-R15	12	12	30	100	1.5
	2120-100-R20	12	12	30	100	2
	2120-100-R25	12	12	30	100	2.5
	2120-100-R30	12	12	30	100	3

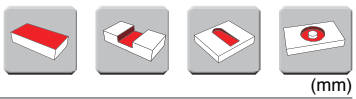
M This is metric size. We can also provide in inch type

IPRE4000 (Standard Radius)



4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø2~Ø12	0.00 ~ -0.02

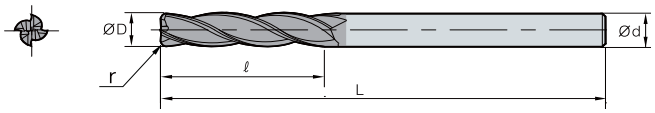


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 4	4020-050-R02	2	4	6	50	0.2
	4020-050-R03	2	4	6	50	0.3
	4020-050-R05	2	4	6	50	0.5
	4025-050-R02	2.5	4	8	50	0.2
	4030-050-R02-S3	3	3	8	50	0.2
	4030-050-R03-S3	3	3	8	50	0.3
	4030-050-R05-S3	3	3	8	50	0.5
	4030-050-R10-S3	3	3	8	50	1
	4030-050-R02	3	4	8	50	0.2
	4030-050-R03	3	4	8	50	0.3
	4030-050-R05	3	4	8	50	0.5
	4030-050-R10	3	4	8	50	1
	4040-050-R02	4	4	10	50	0.2
	4040-050-R03	4	4	10	50	0.3
	4040-050-R05	4	4	10	50	0.5
	4040-050-R10	4	4	10	50	1
	4040-050-R15	4	4	10	50	1.5
	4050-050-R02	5	6	13	50	0.2
	4050-050-R03	5	6	13	50	0.3
	4050-050-R05	5	6	13	50	0.5
	4050-050-R10	5	6	13	50	1
	4060-050-R02	6	6	15	50	0.2
	4060-050-R03	6	6	15	50	0.3
	4060-050-R05	6	6	15	50	0.5
	4060-050-R10	6	6	15	50	1
	4060-050-R15	6	6	15	50	1.5
	4060-050-R20	6	6	15	50	2
	4080-060-R03	8	8	20	60	0.3
	4080-060-R05	8	8	20	60	0.5
	4080-060-R10	8	8	20	60	1
	4080-060-R15	8	8	20	60	1.5
	4080-060-R20	8	8	20	60	2
	4080-060-R25	8	8	20	60	2.5
	4080-060-R30	8	8	20	60	3
	4100-075-R03	10	10	25	75	0.3
	4100-075-R05	10	10	25	75	0.5
	4100-075-R10	10	10	25	75	1
	4100-075-R15	10	10	25	75	1.5
	4100-075-R20	10	10	25	75	2
	4100-075-R25	10	10	25	75	2.5
	4100-075-R30	10	10	25	75	3
	4120-075-R03	12	12	30	75	0.3
	4120-075-R05	12	12	30	75	0.5
	4120-075-R10	12	12	30	75	1
	4120-075-R15	12	12	30	75	1.5
	4120-075-R20	12	12	30	75	2
	4120-075-R25	12	12	30	75	2.5
	4120-075-R30	12	12	30	75	3

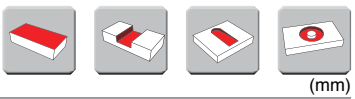
M This is metric size. We can also provide in inch type

IPLRE4000 (Long Radius)



4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø3~Ø12	0.00 ~ -0.02



(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 4	4030-075-R03	3	3	8	75	0.3
	4030-075-R05	3	3	8	75	0.5
	4030-075-R10	3	3	8	75	1
	4040-075-R03	4	4	10	75	0.3
	4040-075-R05	4	4	10	75	0.5
	4040-075-R10	4	4	10	75	1
	4040-075-R15	4	4	10	75	1.5
	4060-100-R03	6	6	15	100	0.3
	4060-100-R05	6	6	15	100	0.5
	4060-100-R10	6	6	15	100	1
	4060-100-R15	6	6	15	100	1.5
	4060-100-R20	6	6	15	100	2
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R10	8	8	20	100	1
	4080-100-R15	8	8	20	100	1.5
	4080-100-R20	8	8	20	100	2
	4080-100-R25	8	8	20	100	2.5
	4080-100-R30	8	8	20	100	3
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R10	10	10	25	100	1
	4100-100-R15	10	10	25	100	1.5
	4100-100-R20	10	10	25	100	2
	4100-100-R25	10	10	25	100	2.5
	4100-100-R30	10	10	25	100	3
	4120-100-R03	12	12	30	100	0.3
	4120-100-R05	12	12	30	100	0.5
	4120-100-R10	12	12	30	100	1
	4120-100-R15	12	12	30	100	1.5
	4120-100-R20	12	12	30	100	2
	4120-100-R25	12	12	30	100	2.5
	4120-100-R30	12	12	30	100	3

M This is metric size. We can also provide in inch type

High efficiency and high feed in machining

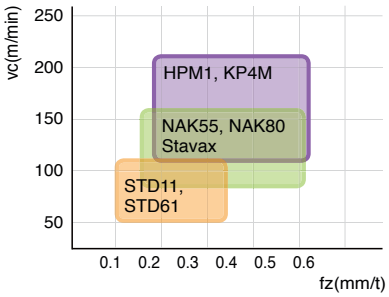
F Endmill

Feed-up Endmill

Feature

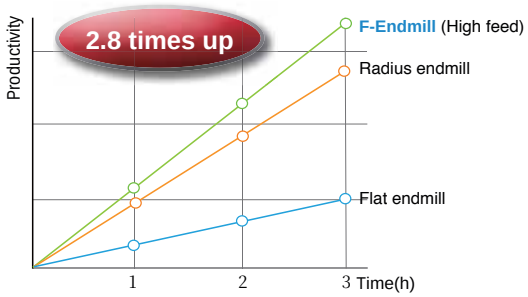
- Wider chip pocket area Highly efficient operation
- High feed machining possible by dispersing cutting forces

■ Application by workpiece



Productivity example

■ Productivity comparison

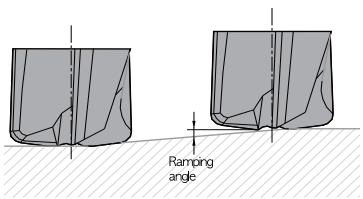


Type	Speed (vc)	Feed (fz)	D.O.C		Machining volume (mm³/min)
			ap	ae	
F-Endmill (High feed)	180	**0.30**	0.5	5.0	**135,000**
Radius Endmill	200	0.09	1.0	5.0	90,000
Flat Endmill	120	0.05	8.0	0.2	48,000

Higher productivity by feed increase. **2.8 times**

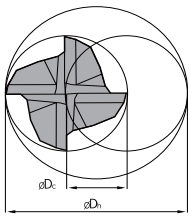
Programing information

■ Ramping



Ramping angle	Feed
1°	100%
2°	80%
3°	60%
4°	50%

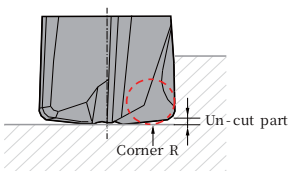
■ Helical ramping



Diameter (ØD)	Min. diameter	Max. diameter
6	7.8	12
8	10.2	16
10	12.4	20
12	14.9	24

∗ØDc : Feed(Tool center)
∗ØDh : Machining area

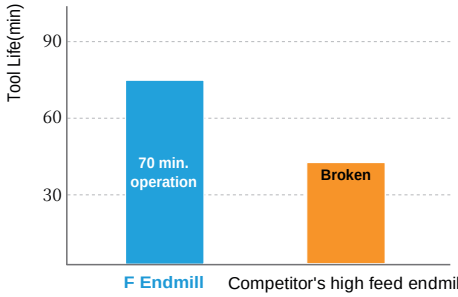
■ CAM program information



Diameter(ØD)	Endmill-R	CAM-Radius	Un-cut part
6	0.5	0.7	0.21
8	0.5	0.8	0.32
10	1.0	1.3	0.36
12	1.2	1.6	1.45

M This is metric size. We can also provide in inch type

Machining example

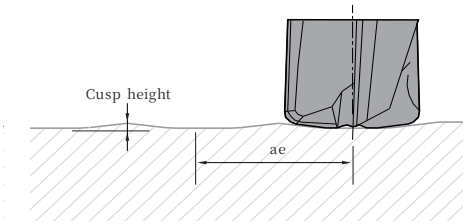


- **Workpiece** STD61+SKT4(HRC 45~50)
- **Cutting condition** D=Ø12, n(min^{-1})=4,000, vc(m/min)=150.8, vf(mm/min)=4,000, fz(mm/t)=0.25 , ap(mm)=3.6, ae(mm)=6.0, Dry
- **Tools** FME4120-075-R12

Cutting condition

Cusp height by radial depth of cut

Diameter (ØD)	Radial depth ae(mm)					
	0.1XD	0.2XD	0.3XD	0.4XD	0.5XD	0.6XD
6	0	0	0	0.02	0.06	0.11
8	0	0	0	0.04	0.10	0.15
10	0	0	0.01	0.07	0.14	0.21
12	0	0	0.01	0.08	0.17	0.25



Medium cut

Diameter (ØD)	Mold steel HRC35~45(HPM1, KP4M)				Mold steel HRC45~55(NAK55, NAK80, STAVAX)				Heat treated HRC55(SKD11, STD61)			
	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)
6	11,600	11,200	0.24	1.6	9,000	7,570	0.21	1.6	5,800	3,500	0.18	1.6
8	8,700		0.32	2.2	6,700		0.28	2.2	4,300		0.24	2.2
10	7,000		0.40	2.7	5,400		0.35	2.7	3,500		0.30	2.7
12	5,800		0.48	3.3	4,500		0.42	3.3	2,900		0.36	3.3

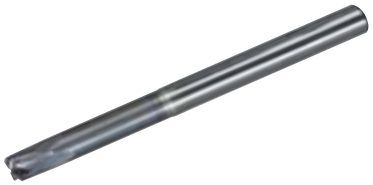
Roughing cut

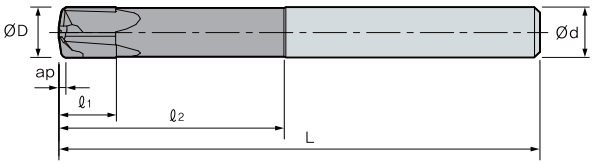
Diameter (ØD)	Mold steel HRC35~45(HPM1, KP4M)				Mold steel HRC45~55(NAK55, NAK80, STAVAX)				Heat treated HRC55(SKD11, STD61)			
	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)	RPM n(min^{-1})	Feed (mm/min)	ap(mm)	ae(mm)
6	8,488	9,167	0.27	3.0	6,366	6,112	0.24	3.0	4,244	2,546	0.21	3.0
8	6,366		0.36	4.0	4,775		0.32	4.0	3,183		0.28	4.0
10	5,093		0.45	5.0	3,820		0.40	5.0	2,546		0.35	5.0
12	4,244		0.54	6.0	3,183		0.48	6.0	2,122		0.42	6.0

* Cutting condition by overhang
  1. Standard overhang : Follow cutting conditions above.
  2. Long type : Apply 80% feed & 80% ae.
  3. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

M This is metric size. We can also provide in inch type

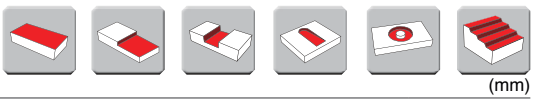
FME4000 (Standard)





4 | H-A 0° | h6 shank | Substrate PC203F

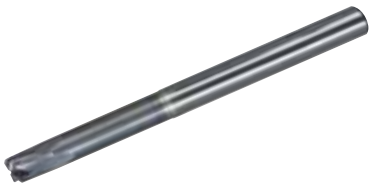
ØD	Tolerance
Ø6~Ø12	- 0.01 ~ - 0.03

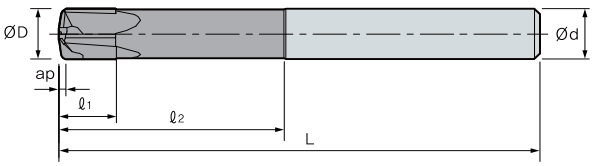


(mm)

Designation		R	ØD	Ød	ℓ_1	ℓ_2	L	Max. ap (mm)	CAM-Radius
FME	4060-050-R05	0.5	6	6	4.5	18	50	0.35	0.7
4	4080-060-R05	0.5	8	8	6	24	60	0.45	0.8
	4100-070-R10	1.0	10	10	7.5	30	70	0.65	1.3
	4120-075-R12	1.2	12	12	9	36	75	0.78	1.6

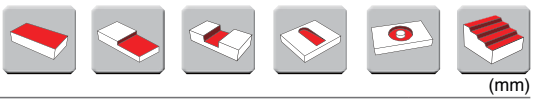
FMLE4000 (Long)





4 | H-A 0° | h6 shank | Substrate PC203F

ØD	Tolerance
Ø6~Ø12	- 0.01 ~ - 0.03



(mm)

Designation		R	ØD	Ød	ℓ_1	ℓ_2	L	Max. ap (mm)	CAM-Radius
FMLE	4060-090-R05	0.5	6	6	4.5	30	90	0.35	0.7
4	4080-090-R05	0.5	8	8	6	40	90	0.45	0.8
	4100-100-R10	1.0	10	10	7.5	50	100	0.65	1.3
	4120-110-R12	1.2	12	12	9	60	110	0.78	1.6

M This is metric size. We can also provide in inch type

Ideal Endmill for ultra precision geometry machining

Micro Endmills

- Enhanced rigidity of neck eliminates braking of the tool
- It is ideal for ultra precision geometry machining
- Slotting, Die-sinking, Profiling, Miniature, Finishing
- Camera, Watch, Precision mold

※ Notice

Users should operate high precision machine and clamp tool with its' best rigidity and accuracy
Anti vibration system is required for stable cutting. Watch operation for chip evacuation

Micro Endmills Code System

MS E 2 004 - S

Solid Endmill	Type	No. of edge	Diameter	Shank diameter
Micro Solid	**E** : Flat **BE** : Ball	2 Edges	Ø0.4	**S** : Ø3.0mm **No code** : Ø4.0mm (Diameter Ø2, Ø3) Ø6.0mm (Others)

Product shape

MSBE

MSE

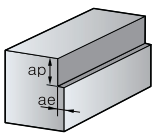
Recommended Cutting Condition - MSE2000

Workpiece	Carbon steel, Alloy steel, Cast iron			Alloy steel, High speed steel		
Condition	HRC45 ~			HRC45~55		
	SM50C,SCM,STD			STD61,STAVAX		
Diameter(Ø)	R.P.M n(min-1)	Feed vf(mm/min)	Radial depth ae(mm)	R.P.M n(min-1)	Feed vf(mm/min)	Radial depth ae(mm)
0.4	40,000	640	0.01	40,000	640	0.01
0.5	40,000	800	0.02	40,000	800	0.015
0.6	40,000	960	0.02	40,000	960	0.02
0.7	40,000	1,120	0.02	40,000	1,120	0.02
0.8	40,000	1,280	0.03	40,000	1,280	0.03
0.9	40,000	1,440	0.04	40,000	1,280	0.04
1.0	40,000	1,600	0.06	40,000	1,280	0.06

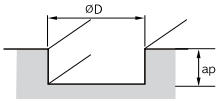
• Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio
1. Workpiece should be clamped rigidly. In case of vibration, reduce RPM and feed rate by the same ratio
2. In case of shouldering, reduce feed rate to 1/3

M This is metric size. We can also provide in inch type

Application tip

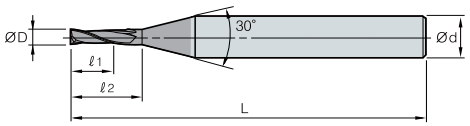


• ap≤ae



• D≥3 : increase RPM 50~70%
reduce feed rate 40~60%
• Slotting : ap≤ae

MSE2000 (Flat)



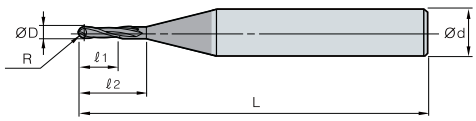
2 | H·A 30° | TiAlN | Substrate PC215F

ØD	Tolerance
Ø0.2~Ø1.0	0 ~ - 0.02

(mm)

Designation		ØD	Ød	ℓ_1	ℓ_2	L
MSE	2002	0.2	4	0.4	0.6	40
2	2003	0.3	4	0.6	0.9	40
	2004	0.4	6	0.8	1.2	50
	2004-S	0.4	3	0.8	1.2	45
	2005	0.5	6	1	1.5	50
	2005-S	0.5	3	1	1.5	45
	2006	0.6	6	1.2	1.8	50
	2006-S	0.6	3	1.2	1.8	45
	2007	0.7	6	14	2.1	50
	2007-S	0.7	3	1.4	2.1	45
	2008	0.8	6	1.6	2.4	50
	2008-S	0.8	3	1.6	2.4	45
	2009	0.9	6	1.8	2.7	50
	2009-S	0.9	3	1.8	2.7	45
	2010	1.0	6	2.0	3.0	50
	2010-S	1.0	3	2.0	3.0	45

MSBE2000 (Ball)



2 | H·A 30° | TiAlN | Substrate PC215F

ØD	Tolerance
Ø0.2~Ø1.0	0 ~ - 0.02

(mm)

Designation		R	ØD	Ød	ℓ_1	ℓ_2	L
MSBE	2002	0.10	0.2	4	0.2	0.4	40
2	2003	0.15	0.3	4	0.3	0.6	40
	2004	0.20	0.4	6	0.8	1.2	50
	2004-S	0.20	0.4	3	0.8	1.2	45
	2005	0.25	0.5	6	1.0	1.5	50
	2005-S	0.25	0.5	3	1.0	1.5	45
	2006	0.30	0.6	6	1.2	1.8	50
	2006-S	0.30	0.6	3	1.2	1.8	45
	2007	0.35	0.7	6	1.4	2.1	50
	2007-S	0.35	0.7	3	1.4	2.1	45
	2008	0.40	0.8	6	1.6	2.4	50
	2008-S	0.40	0.8	3	1.6	2.4	45
	2009	0.45	0.9	6	1.8	2.7	50
	2009-S	0.45	0.9	3	1.8	2.7	45
	2010	0.50	1.0	6	2.0	3.0	50
	2010-S	0.50	1.0	3	2.0	3.0	45

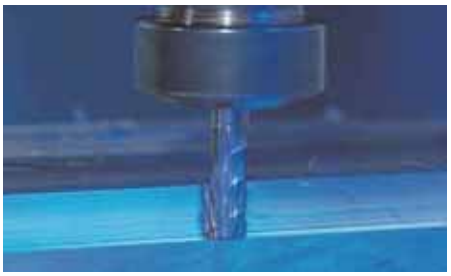
Special endmills order - MSE : MSE20◎◎I-L / MSBE : MSBE20◎◎I-L
EX.1) Diameter : 0.45, I : 1.2, L : 50 MSE20045 1.2-55L
Ex.2) Ball R0.225(Ø0.45), I : 1.2, L : 55 MSBE0045 1.2-55L
The diameter should be smaller than Ø1.0 for MSE, MSBE. In case of above Ø1.0, please refer to SSE-Q and SSBE-Q.

M This is metric size. We can also provide in inch type

Optimal design for stainless steel machining

Solid Endmills for Hard-to-cut material

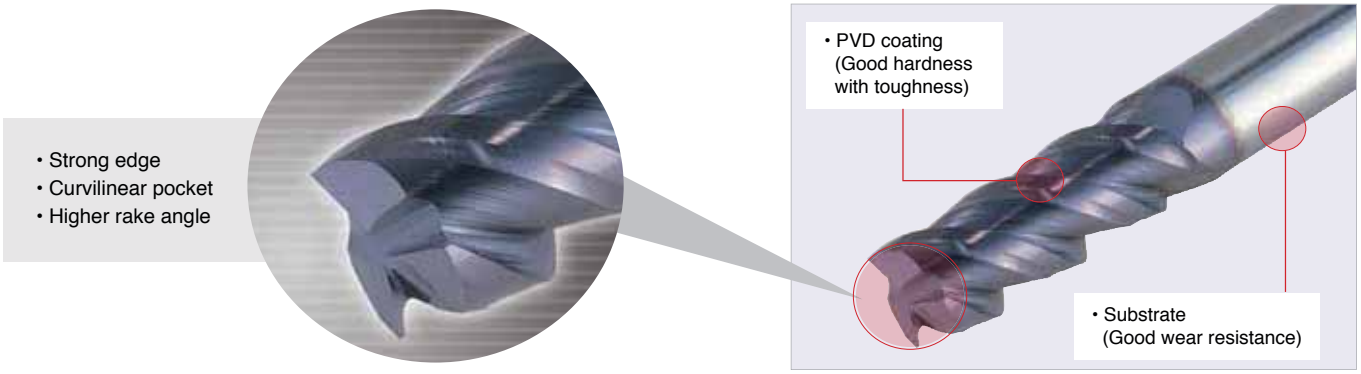
- High rake angle and curvilinear designed pocket for improved chip evacuation.
- Special edge for work hardening
- Optimized for stainless steel machining
  (Stainless steel, Titanium alloy, Inconel, Steel, Alloy steel)
- Multi applications (Shouldering, Slotting, Ramping)



Endmills for Hard-to-cut materials Code System

I	FS	E	A	3	01250	-	2.00
Coating	Flat solid	Endmill	Inch	No. of edges	Diameter		Tool length
				3 Edge	Ø0.1250		2inch

Product shape



Trouble shooting for Stainless steel machining

Stainless steel machining Work hardening

- Poor surface finish
- High temperature on cutting edge
- Built-up edge
- Shear strength in high temperature
- Difficult chip breaking and controlling

Stainless steel machining Trouble shooting

- Low cutting speed
- Sharp cutting edge
- Coolant for low temperature
- Air blow or coolant for better chip evacuation
- Higher harness of substrates and coating

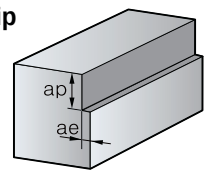
Comparison Stainless steel to Carbon steel

Classifications		KS grade	Tensile strength (kgf/mm²)	Thermal expansion coefficient (10^{-6}/℃)	Thermal expansion Rate (10^{-2}cal/cm.s.℃)	Magnetic	Annealing hardening	Hardness (HB)	Machine Ability rate (%)
Carbon steel		SS34 SS41 SM10C SM15C	38~65	11.4	11.2	○	○	110~180	50~70
Stainless steel	Martensite series	STS403 STS410 STS431	~55	9.9~11.7	5.9	○	○	215	50~60
	Ferrite series	STS405 STS430	50~60	10.4	6.4	○	×	183	50~60
	Austenite series	STS301 STS304 STS316	55~65	14.4~16.9	3.8	×	×	187	35~45

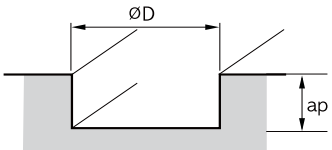
Recommended Cutting Condition

Workpiece / Condition / Diameter(Ø)	Stalnless steel STS		Titanium alloy / Inconel		Normal steel (SS, SM) (Under HRC25)		Alloy steel (SCM) (HRC25~35)		Hardened steel (STD) (HRC40~50)	
	R.P.M n(min⁻¹)	Feed vf(ipm)	R.P.M n(min⁻¹)	Feed vf(ipm)	R.P.M n(min⁻¹)	Feed vf(ipm)	R.P.M n(min⁻¹)	Feed vf(ipm)	R.P.M n(min⁻¹)	Feed vf(ipm)
1/8	4,750	9.843	2,300	3.543	7,800	22.441	5,250	12.992	3,500	10.24
5/32	4,000	10.236	2,000	3.543	6,600	23.622	4,500	13.386	3,000	11.02
3/16	3,500	12.205	1,600	3.543	5,700	29.921	3,750	13.780	2,750	11.02
7/32	3,250	13.189	1,400	3.543	5,250	29.134	3,375	13.976	2,625	11.02
1/4	2,750	14.488	1,150	3.661	4,500	28.346	2,800	15.157	2,375	11.02
9/32	2,500	14.764	1,100	3.740	4,200	28.937	2,600	16.142	2,250	11.42
5/16	2,000	15.354	1,000	3.937	3,600	29.528	2,200	18.110	2,000	11.81
3/8	1,775	15.945	850	4.528	3,000	29.528	1,900	18.110	1,625	11.81
7/16	1,600	15.551	750	4.331	2,600	28.740	1,650	17.126	1,350	11.42
1/2	1,350	13.780	650	3.819	2,300	26.968	1,400	15.354	1,100	10.83
9/16	1,200	12.598	600	3.740	2,200	25.984	1,300	14.567	1,000	10.63
5/8	1,000	10.630	500	3.543	1,800	19.291	1,100	12.598	800	9.06
11/16	906	10.354	463	3.346	1,463	16.063	1,025	11.890	725	8.62
3/4	813	10.039	425	3.346	1,125	12.795	950	11.142	650	8.19

● **Application tip**

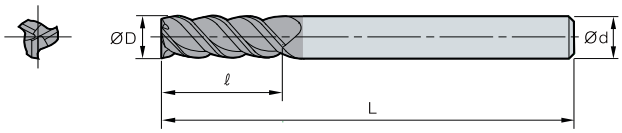


■ Shouldering depth (ap) and radial depth (ae)
- Normal steel, Alloy steel, Stainless steel
- Titanium alloy, Inconel, Hardened steel



■ Slotting depth(ap)
- Normal steel, Alloy steel
- Stainless steel
- Titanium alloy, Inconel, Hardened steel

IFSEA3000 (Flat)



ØD	Tolerance
Ø0.1250 ~ Ø0.2188	- 0.0004 ~ - 0.0012
~ Ø0.3750	- 0.0006 ~ - 0.0016
~ Ø0.5000	- 0.0009 ~ - 0.0020

(inch)

Designation		ØD		Ød	ℓ	L
IFSEA	301250-2.00	1/8	0.1250	0.1250	0.3750	2.00
2	301562-2.00	5/32	0.1562	0.1875	0.5000	2.00
	301875-2.00	3/16	0.1875	0.1875	0.5000	2.00
	302188-2.00	7/32	0.2188	0.2500	0.5625	2.00
	302500-2.50	1/4	0.2500	0.2500	0.7500	2.50
	302812-2.50	9/32	0.2812	0.3125	0.7500	2.50
	303125-2.50	5/16	0.3125	0.3125	0.7500	2.50
	303750-2.75	3/8	0.3750	0.3750	0.7500	2.75
	304375-3.00	7/16	0.4375	0.4375	1.0000	3.00
	305000-3.50	1/2	0.5000	0.5000	1.2500	3.50
	305625-3.50	9/16	0.5625	0.5625	1.5000	3.50
	306250-3.50	5/8	0.6250	0.6250	1.5000	3.50
	306875-4.00	11/16	0.6875	0.7500	1.5000	4.00
	307500-4.50	3/4	0.7500	0.7500	2.0000	4.50

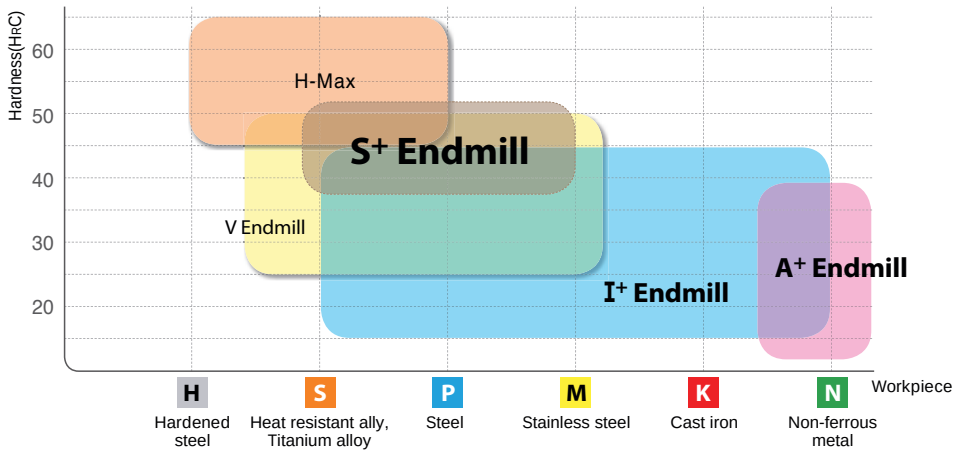
IFSE3◎◎◎-L-I(V00)
Ex.1) 3 flutes, diamater : 6.3.I : 17, L : 60 - IFSE3063-060-V17

Stainless Endmill Series

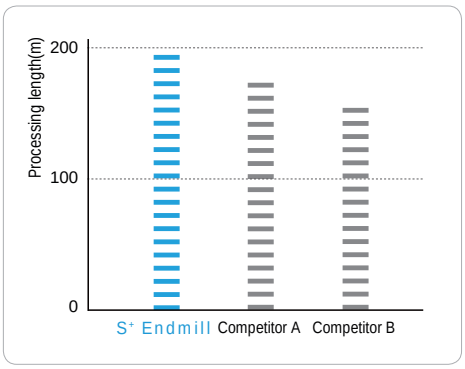
S+ Endmill New

- Strong cutting edge ensures long tool life.
- Special coating with high oxidation resistance
- High rake angle and curvilinear chip pocket allow chip evacuation.
- Special cutting edge prevents hardening of tools.
- Optimal machinability in stainless steel machining
- Available for steel, alloy steel and hardening steel machining
- Available for multiple operations
  (Shouldering, slotting and ramping etc.)

Application area



Comparison



S+ Endmill | Competitor A | Competitor B

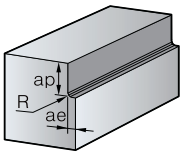
- **Workpiece** : STS304
- **Curring condition** : diameter=Ø8.0, n(min^{-1})=4000, vc(m/min)=100, vf(mm/min)=480, fz(mm/t)=0.04
  ap(mm)=8, ae(mm)=0.8, dry
- **Tool** : SPFE4080-060

M This is metric size. We can also provide in inch type

Recommend Cutting Conditions

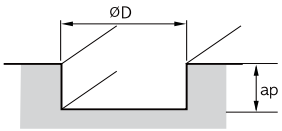
Workpiece / Condition / Diameter(Ø)	Stainless steel STS		Titanium alloy / Inconel		Normal steel(SS, SM) (Under HRC 25)		Alloy steel(SCM) (HRC 25~35)		Hardened steel(STD) (HRC 40~50)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
2	5,500	240	2,600	90	9,000	540	6,000	320	4,000	240
4	4,000	260	2,000	90	6,600	600	4,500	340	3,000	280
6	3,000	360	1,200	90	4,800	720	3,000	360	2,500	280
8	2,000	390	1,000	100	3,600	750	2,200	460	2,000	300
10	1,700	410	800	120	2,800	750	1,800	460	1,500	300
12	1,500	380	700	100	2,400	710	1,500	410	1,200	280
14	1,200	320	600	95	2,200	660	1,300	370	1,000	270
16	1,000	270	500	90	1,800	490	1,100	320	800	230
20	750	250	400	85	900	270	900	270	600	200

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**

- Normal steel, Alloy steel, Stainless steel
- Titanium alloy, Inconel, Hardened steel



■ **Slotting depth(ap)**

- Normal steel, Alloy steel
- Stainless steel
- Titanium alloy, Inconel, Hardened steel

Stainless steel machining

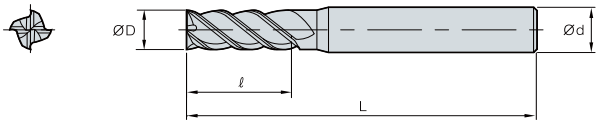
- Low thermal conductivity of stainless steel alloy causes conducting heat to the tool and fracture and chipping.
- Stainless steel alloy machining gets easily wear and high cutting resistance.
- High temperature in stainless steel alloy machining lowers cutting conditions and decrease the quality of surface roughness.

Trouble shooting for stainless steel

- Get low cutting conditions.
- Get deeper ap than the work hardened layer and use tools with sharp cutting edge.
- Use coolant.

M This is metric size. We can also provide in inch type

SPFE4000 (Standard Flat)



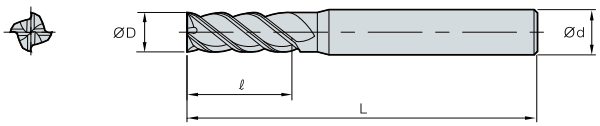
4 | H·A 45° | Substrate PC325 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
SPFE	4010-050	1.0	4	3	50
4	4015-050	1.5	4	4	50
	4020-050	2.0	4	6	50
	4025-050	2.5	4	8	50
	4030-050	3.0	4	9	50
	4030-050-S6	3.0	6	9	50
	4040-050	4.0	4	11	50
	4040-050-S6	4.0	6	11	50
	4050-050	5.0	6	13	50
	4060-050	6.0	6	16	50
	4080-060	8.0	8	20	60
	4100-075	10.0	10	30	75
	4120-075	12.0	12	32	75

SPLFE4000 (Long Flat)



4 | H·A 45° | Substrate PC325 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
SPLFE	4010-050	1.0	4	4	50
4	4015-050	1.5	4	6	50
	4020-050	2.0	4	8	50
	4025-050	2.5	4	10	50
	4030-050-S6	3.0	6	12	50
	4040-050-S6	4.0	6	16	50
	4050-060	5.0	6	20	60
	4060-060	6.0	6	24	60
	4080-075	8.0	8	35	75
	4100-100	10.0	10	45	100
	4120-100	12.0	12	45	100

M This is metric size. We can also provide in inch type

Good chip evacuation

Solid Endmills for Aluminum

- Minimum cutting load and built-up edge
- Good surface finish
- DLC coating
  - Higher hardeness(Hv3000-7000), longer tool life comparing uncoated endmill
  - Excellent lubrication by low friction co-efficient (u<0.1)
  - Good chip evacuation
- Superior in Aluminum, Aluminum alloys, Copper and Copper alloys

Endmills for Aluminum Code System

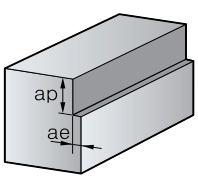
SSE A A 2 01250 - 1.50

Solid endmill	Application	America	No. of edges	Diameter	Tool length
	For Aluminum		2 : 2 Edge 3 : 3 Edge	Ø0.1250	1.5inch

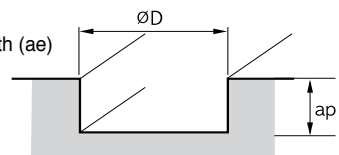
Recommended Cutting Condition (SSEA2000)

Workpiece / Condition / Diameter(Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n(min^{-1})	Feed vf(ipm)	R.P.M n(min^{-1})	Feed vf(ipm)	R.P.M n(min^{-1})	Feed vf(ipm)	R.P.M n(min^{-1})	Feed vf(ipm)
1/16	40,000	27	39,000	21	39,000	21	36,000	14
3/32	40,000	39	31,500	28	31,500	28	26,500	18
1/8	32,000	44	25,000	30	25,000	30	21,000	19
5/32	24,000	47	19,000	31	19,000	31	13,000	20
3/16	19,000	50	15,000	35	15,000	31	13,000	22
7/32	17,500	55	14,000	36	14,000	33	11,000	23
1/4	15,000	60	12,125	38	12,125	35	10,250	24
9/32	14,000	60	11,250	38	11,250	36	9,500	24
5/16	12,000	60	9,500	38	9,500	38	8,000	25
3/8	10,125	60	8,075	38	8,075	38	6,800	25
7/16	8,750	60	6,900	38	7,000	38	5,850	25
1/2	7,500	60	6,000	38	6,000	36	4,975	25
9/16	7,000	60	5,600	38	5,600	35	4,650	24
5/8	6,000	60	4,800	38	4,800	31	4,000	23
11/16	5,550	47	4,425	39	4,425	31	3,700	22
3/4	5,100	47	4,050	39	4,050	31	3,400	21

Application tip



■Shouldering depth (ap) and radial depth (ae)
- ae≤0.2D(D<3)
- ae≤0.5D(D≥3)



■Slotting depth(ap)
- ap≤D(max:0.472inch)

* Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Copper & Aluminum machining

1. Built-up edge
2. Low heat resistance could create unnessary stress or accuracy problem after machining
3. Scratch due to low hardness
4. Low tool life due to flank wear

Trouble shooting for Copper & Aluminum machining

1. Use a higher rake, sharp edge, oil (MQL) mist to decrease cutting load and built-up edge
2. Increase Vc and reduce the depth of cut for a better surface finish

SSEAA2000/3000 (Flat)

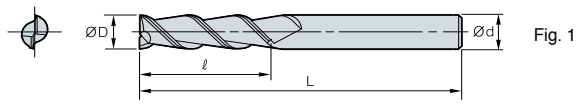


Fig. 1

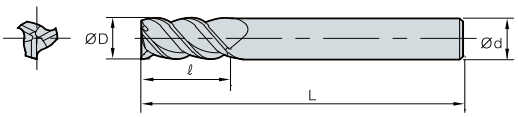


Fig. 2

2 | 3 | H·A 45° | Carbide DLC | Substrate H01 PD3000

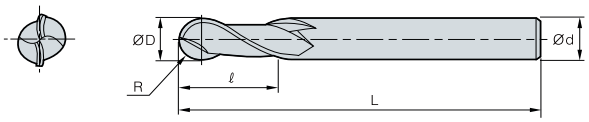
ØD	Tolerance
Ø0.0625 ~ Ø0.2188	- 0.0004 ~ - 0.0012
~ Ø0.3750	- 0.0006 ~ - 0.0016
~ Ø0.5000	- 0.0008 ~ - 0.0020

(inch)

Designation		ØD		Ød	ℓ	L	Fig.
SSEAA 2	200625-1.50	1/16	0.0625	0.1250	0.1562	1.50	1
	200938-1.50	3/32	0.0938	0.1250	0.2812	1.50	1
	201250-2.00	1/8	0.1250	0.1250	0.3750	2.00	1
	201562-2.00	5/32	0.1562	0.1875	0.5000	2.00	1
	201875-2.00	3/16	0.1875	0.1875	0.6250	2.00	1
	202188-2.00	7/32	0.2188	0.2500	0.6250	2.00	1
	202500-2.50	1/4	0.2500	0.2500	0.7500	2.50	1
	202812-2.50	9/32	0.2812	0.3125	0.7500	2.50	1
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50	1
	203750-2.75	3/8	0.3750	0.3750	0.7500	2.75	1
	204375-3.00	7/16	0.4375	0.4375	1.0000	3.00	1
	205000-3.50	1/2	0.5000	0.5000	1.2500	3.50	1
	205625-3.50	9/16	0.5625	0.5625	1.5000	3.50	1
	206250-3.50	5/8	0.6250	0.6250	1.5000	3.50	1
	206875-4.00	11/16	0.6875	0.7500	2.0000	4.00	1
	207500-4.00	3/4	0.7500	0.7500	2.0000	4.00	1
SSEAA 3	200938-1.50	3/32	0.0938	0.1250	0.2812	1.50	2
	201250-2.00	1/8	0.1250	0.1250	0.3750	2.00	2
	201562-2.00	5/32	0.1562	0.1875	0.5000	2.00	2
	201875-2.00	3/16	0.1875	0.1875	0.6250	2.00	2
	202188-2.00	7/32	0.2188	0.2500	0.6250	2.00	2
	202500-2.50	1/4	0.2500	0.2500	0.7500	2.50	2
	202812-2.50	9/32	0.2812	0.3125	0.7500	2.50	2
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50	2
	203750-2.75	3/8	0.3750	0.3750	0.7500	2.75	2
	204375-3.00	7/16	0.4375	0.4375	1.0000	3.00	2
	205000-3.50	1/2	0.5000	0.5000	1.2500	3.50	2
	205625-3.50	9/16	0.5625	0.5625	1.5000	3.50	2
	206250-3.50	5/8	0.6250	0.6250	1.5000	3.50	2

Special endmills order : SSEAA3□□□□□× ℓ- L
Ex.1) 3 flutes, diameter : 0.26, ℓ : 0.70, L : 2.40 - SSEAA3026000 × 0.70-2.40L

SSBEAA2000 (Ball)



2 | H·A 30° | Carbide DLC | Substrate H01 PD3000

ØD	Tolerance
All	0 ~ - 0.0012

(inch)

Designation		R	ØD		Ød	ℓ	L
SSBEAA	200625-2.75	1/32	1/16	0.0625	0.1250	0.1562	2.75
2	200938-2.75	3/64	3/32	0.0938	0.1250	0.3125	2.75
	201250-2.75	1/16	1/8	0.1250	0.1250	0.3750	2.75
	201562-2.75	5/64	5/32	0.1562	0.1875	0.5000	2.75
	201875-3.00	3/32	3/16	0.1875	0.1875	0.6250	3.00
	202188-3.00	7/64	7/32	0.2188	0.2500	0.6250	3.00
	202500-3.50	1/8	1/4	0.2500	0.2500	0.7500	3.50
	202812-3.50	9/64	9/32	0.2812	0.3125	0.7500	3.50
	203125-3.50	5/32	5/16	0.3125	0.3125	0.7500	3.50
	203750-4.00	3/16	3/8	0.3750	0.3750	1.0000	4.00
	204375-4.50	7/32	7/16	0.4375	0.4375	1.2500	4.50
	205000-4.50	1/4	1/2	0.5000	0.5000	1.2500	4.50
	205625-4.50	9/32	9/16	0.5625	0.5625	1.2500	4.50
	206250-5.00	5/16	5/8	0.6250	0.6250	1.5000	5.00
	206875-5.00	11/32	11/16	0.6875	0.7500	2.0000	5.00
	207500-5.00	3/8	3/4	0.7500	0.7500	2.0000	5.00

Special endmills order : SSBEA2□□□□□× ℓ - L
Ex.1) 2 flutes, diameter : 0.26. ℓ : 0.70, L : 2.40 × SSBEAA2026000×0.70-2.40L

• Technique of machining Copper/Aluminum steel

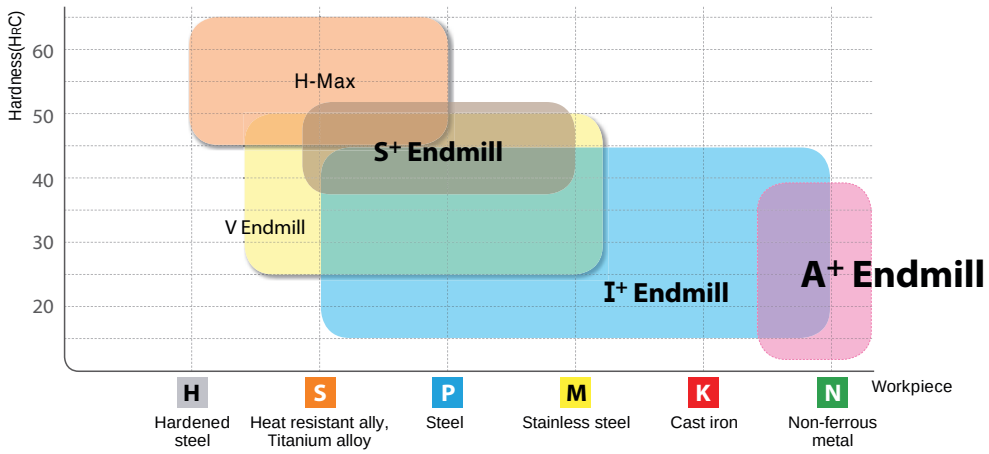
1. With high rake angle cutting edge, sharp tools and oil mist, able to minimize cutting load and built-up-edge
2. Applying higher cutting speed and shallower depth, able to make surface finishing and productivity improved

Aluminum Endmill Series

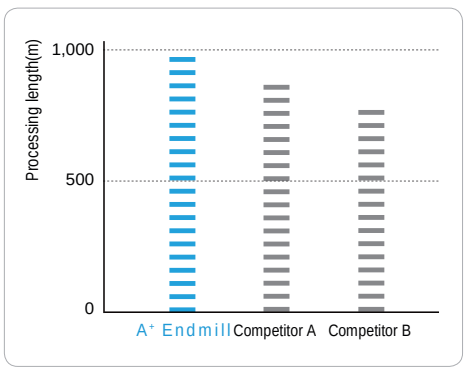
A+ Endmill New

- Exclusive U shaped flute
  - Excellent chip evacuation even in high feed machining
  - U shaped and buffed flute reduces built-up-edge.
- Double relief angle
  - High rigidity of cutting edge ensures high productivity.
- Sharp cutting edge
  - For both roughing and finishing
    (Shouldering, slotting and ramping etc.)

Application area



Comparison



A+ Endmill | Competitor A | Competitor B

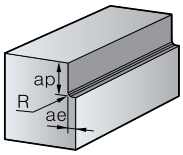
- **Workpiece** : A7075
- **Curring condition** : diameter=Ø8.0, n(min-1)=8000, vc(m/min)=200, vf(mm/min)=1200, fz(mm/t)=0.05
  ap(mm)=8, ae(mm)=2.0, wet
- **Tool** : APFE3080-060

M This is metric size. We can also provide in inch type

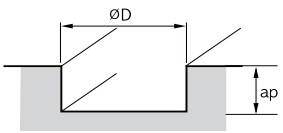
Recommend Cutting Conditions

Workpiece / Condition / Diameter(Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

Application tip



■Shouldering depth (ap) and radial depth (ae)
- ae≤0.2D(D<3)
- ae≤0.5D(D≥3)



■ Slotting depth(ap)
- ae≤0.2D(D<3)
- ae≤0.5D(D≥3)

- Clamp the workpiece rigidly. In case of vibration, reduce RPM and feed rate by the same ratio.

Aluminum machining

- Built-up edge
- Low heat resistance could create residual stress or inaccuracy after machining.
- Scratch due to low hardness
- Low tool life due to flank wear

Trouble shooting for Aluminum machining

- Use a higher rake, sharp edge and oil (MQL) mist to decrease cutting load and built-up edge.
- Increase Vc and reduce the depth of cut for better surface finish.

M This is metric size. We can also provide in inch type

APFE2000/3000 (Flat) Standard

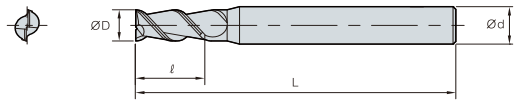


Fig. 1

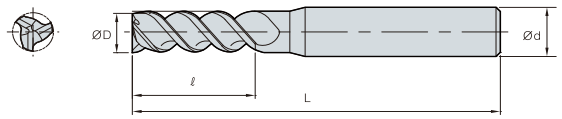


Fig. 2

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APFE 2	2025-050	2.5	6	8	50	1
	2030-050	3.0	6	9	50	1
	2040-050	4.0	6	12	50	1
	2050-050	5.0	6	15	50	1
	2060-050	6.0	6	18	50	1
	2080-060	8.0	8	20	60	1
	2100-075	10.0	10	30	75	1
	2120-075	12.0	12	32	75	1
	2160-100	16.0	16	45	100	1
	2200-100	20.0	20	45	100	1
APFE 3	3025-050	2.5	6	8	50	2
	3030-050	3.0	6	9	50	2
	3040-050	4.0	6	12	50	2
	3050-050	5.0	6	15	50	2
	3060-050	6.0	6	18	50	2
	3080-060	8.0	8	20	60	2
	3100-075	10.0	10	30	75	2
	3120-075	12.0	12	32	75	2
	3160-100	16.0	16	45	100	2
	3200-100	20.0	20	45	100	2

M This is metric size. We can also provide in inch type

APLFE2000/3000 (Long Flat)

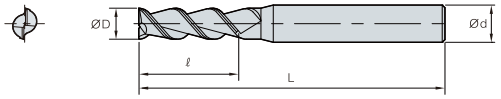


Fig. 1

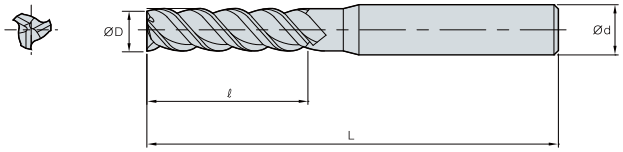


Fig. 2

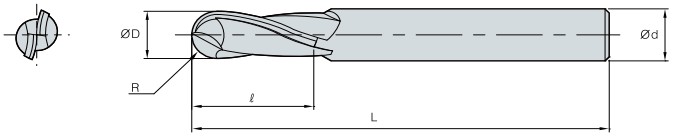
ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APLFE	2030-060	3.0	6	12	60	1
	2040-060	4.0	6	16	60	1
	2050-060	5.0	6	20	60	1
	2060-075	6.0	6	25	75	1
	2080-075	8.0	8	32	75	1
	2100-100	10.0	10	45	100	1
	2120-100	12.0	12	45	100	1
	2160-150	16.0	16	65	150	1
	2200-150	20.0	20	75	150	1
APLFE	3030-060	3.0	6	12	60	2
	3040-060	4.0	6	16	60	2
	3050-060	5.0	6	20	60	2
	3060-075	6.0	6	25	75	2
	3080-075	8.0	8	32	75	2
	3100-100	10.0	10	45	100	2
	3120-100	12.0	12	45	100	2
	3160-150	16.0	16	65	150	2
	3200-150	20.0	20	75	150	2

M This is metric size. We can also provide in inch type

APBE2000 (Ball) Standard



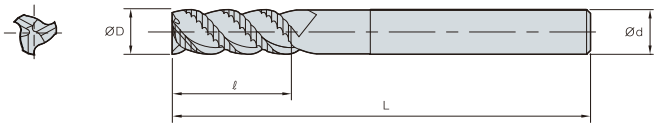
2 | H·A 25° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
APBE 2	2010-050	1.0	4	2	50
	2015-050	1.5	4	3	50
	2020-050	2.0	4	4	50
	2025-050	2.5	4	5	50
	2030-050	3.0	4	6	50
	2035-050	3.5	4	7	50
	2040-050	4.0	4	8	50
	2045-050	4.5	6	9	50
	2050-050	5.0	6	10	50
	2055-050	5.5	6	11	50
	2060-050	6.0	6	12	50
	2080-060	8.0	8	16	60
	2100-075	10.0	10	20	75
	2120-075	12.0	12	24	75

APRE3000 (Roughing)



3 | H·A 45° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02

(mm)

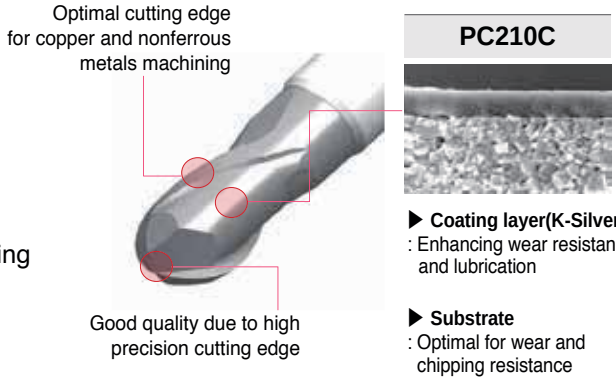
Designation		ØD	Ød	ℓ	L
APRE 3	3040-050	4.0	6	8	50
	3050-050	5.0	6	13	50
	3060-050	6.0	6	15	50
	3065-060	6.5	8	16	60
	3070-060	7.0	8	16	60
	3075-060	7.5	8	20	60
	3080-060	8.0	8	20	60
	3085-075	8.5	10	20	75
	3090-075	9.0	10	20	75
	3095-075	9.5	10	22	75
	3100-075	10.0	10	25	75
	3110-075	11.0	12	30	75
	3120-075	12.0	12	30	75
	3130-075	13.0	14	30	75
	3140-075	14.0	16	32	75
	3150-075	15.0	16	32	75
	3160-100	16.0	16	35	100
	3170-100	17.0	20	35	100
	3180-100	18.0	20	35	100
	3200-100	20.0	20	45	100
	3250-105	25.0	25	50	105

M This is metric size. We can also provide in inch type

Long tool life and good surface roughness for electrode machining

C-Max
(Copper)

- Superior lubricity, wear resistance & chipping resistance due to the K-Silver coating layer and optimal substrate
- Optimal for copper and nonferrous metal machining
- Various line up (ball, flat, radius & long neck type)
- Long tool life and good surface roughness for electrode machining

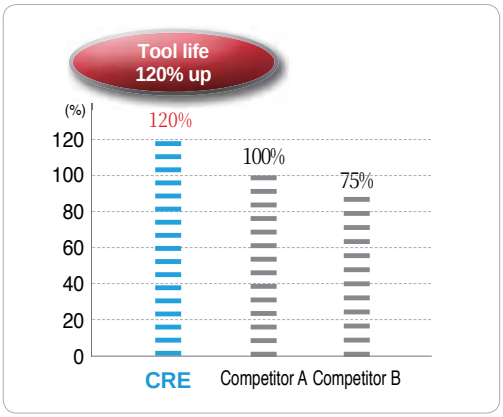


Machining example

- **Electrode machining**
  Workpiece : Cu
  Cutting condition : vc=230(sfm), fz=0.0016(ipt), ae=0.118, ap=0.024,
  Designation : CREA4100-070-R10

- **Test result**

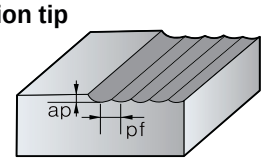
CRE Competitor A Competitor B



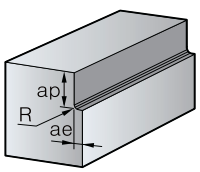
Recommended Cutting Condition

Workpiece / Condition / Diameter(Ø)	CBE/CBNE		CFE/CFNE		CRE/CRNE	
	Copper Alloys					
	R.P.M n(min^{-1})	Feed vf(ipm)	R.P.M n(min^{-1})	Feed vf(ipm)	R.P.M n(min^{-1})	Feed vf(ipm)
1/32	40,000	126	40,000	94	30,000	94
3/64	40,000	142	31,500	74	25,000	74
1/16	40,000	157	23,000	54	20,000	54
5/64	32,000	126	15,000	35	15,000	35
3/32	25,000	98	12,000	30	12,000	30
7/64	23,000	91	11,000	27	11,000	27
1/8	19,750	78	9,500	22	9,500	22
9/64	18,500	73	9,000	21	9,000	21
5/32	16,000	63	8,000	19	8,000	19
3/16	15,050	54	6,800	16	6,800	16
7/32	11,000	43	5,900	14	5,900	14
1/4	10,000	31	4,900	12	4,900	12

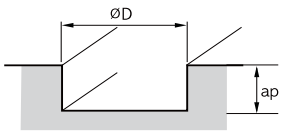
Application tip



• ap=0.1D , pf=0.2D



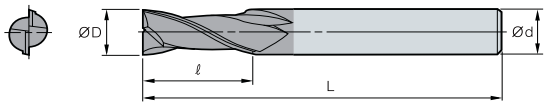
• ap=1.5D , ae=0.1D



• ap≤1.5D

• If vibration occurs, please reduce R.P.M and feed rate at the same rate

CFEA2000 (Flat)



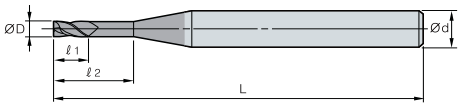
2 | H·A 30° | CrN | Substrate PC210C

ØD	Tolerance	R Tolerance
Ø0.0313 ~Ø -0.2188	Ø0 ~ Ø -0.0004	±0.0002
Ø0.2500 ~Ø -0.5000	Ø0 ~ Ø -0.0004	±0.0002

(inch)

Designation		ØD		Ød	ℓ	L
CFEA	200625-1.50	1/16	0.0625	0.1250	0.1562	1.50
2	200938-2.00	3/32	0.0938	0.1250	0.1875	2.00
	201250-2.00	1/8	0.1250	0.1250	0.3125	2.00
	201562-2.00	5/32	0.1562	0.1875	0.4375	2.00
	201875-2.50	3/16	0.1875	0.1875	0.5000	2.50
	202188-2.50	7/32	0.2188	0.2500	0.5000	2.50
	202500-2.50	1/4	0.2500	0.2500	0.5000	2.50
	202812-2.50	9/32	0.2812	0.3125	0.6250	2.50
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50
	203750-2.75	3/8	0.3750	0.3750	0.8750	2.75
	204375-2.75	7/16	0.4375	0.4375	0.8750	2.75
	205000-3.00	1/2	0.5000	0.5000	1.0000	3.00

CFNEA2000 (Long Neck Flat)



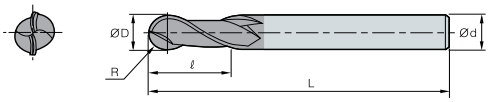
2 | H·A 30° | CrN | Substrate PC210C

ØD	Tolerance
Ø0.0313~Ø0.2188	0 ~ - 0.004
Ø0.2500~Ø0.5000	0 ~ - 0.004

(inch)

Designation		ØD		Ød	ℓ_1	ℓ_2	L
CFNEA	200313-2.00-N01576	1/32	0.0313	0.1250	0.05910	0.1576	2.00
2	200313-2.00-N02364	1/32	0.0313	0.1250	0.05910	0.2364	2.00
	200313-2.00-N03152	1/32	0.0313	0.1250	0.05910	0.3152	2.00
	200313-2.00-N03940	1/32	0.0313	0.1250	0.05910	0.3940	2.00
	200625-2.00-N02364	1/16	0.0625	0.1250	0.09062	0.2364	2.00
	200625-2.00-N03152	1/16	0.0625	0.1250	0.09062	0.3152	2.00
	200625-2.00-N03940	1/16	0.0625	0.1250	0.09062	0.3940	2.00
	200625-2.00-N04728	1/16	0.0625	0.1250	0.09062	0.4728	2.00
	200938-2.00-N02364	3/32	0.0938	0.1250	0.11820	0.2364	2.00
	200938-2.00-N03152	3/32	0.0938	0.1250	0.11820	0.3152	2.00
	200938-2.00-N03940	3/32	0.0938	0.1250	0.11820	0.3940	2.00
	200938-2.00-N04728	3/32	0.0938	0.1250	0.11820	0.4728	2.00
	201250-2.00-N03940	1/8	0.1250	0.1875	0.17730	0.3940	2.00
	201250-2.00-N04728	1/8	0.1250	0.1875	0.17730	0.4728	2.00
	201250-2.50-N05516	1/8	0.1250	0.1875	0.17730	0.5516	2.50
	201250-2.50-N06304	1/8	0.1250	0.1875	0.17730	0.6304	2.50
	201562-2.00-N04728	5/32	0.1562	0.2500	0.23640	0.4728	2.00
	201562-2.00-N06304	5/32	0.1562	0.2500	0.23640	0.6304	2.00
	201562-2.50-N07880	5/32	0.1562	0.2500	0.23640	0.7880	2.50

CBEA2000 (Ball)



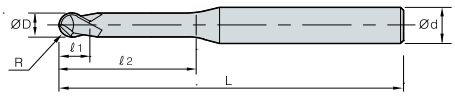
2 | H·A 30° | CrN | Substrate PC210C

ØD	Tolerance	R Tolerance
Ø0.0313 ~Ø -0.2188	Ø0 ~ Ø -0.0004	±0.0002
Ø0.2500 ~Ø -0.5000	Ø0 ~ Ø -0.0004	±0.0002

(inch)

Designation		R	ØD		Ød	ℓ	L
CBEA 2	200625-2.00	1/32	1/16	0.0625	0.1250	0.1562	2.00
	200938-2.00	3/64	3/32	0.0938	0.1250	0.1875	2.00
	201250-2.25	1/16	1/8	0.1250	0.1250	0.3125	2.25
	201562-2.75	5/64	5/32	0.1562	0.1875	0.3125	2.75
	201875-3.00	3/32	3/16	0.1875	0.1875	0.3750	3.00
	202188-3.00	7/64	7/32	0.2188	0.2500	0.5000	3.00
	202500-3.00	1/8	1/4	0.2500	0.2500	0.5000	3.00
	202812-3.50	9/64	9/32	0.2812	0.3125	0.5625	3.50
	203125-3.50	5/32	5/16	0.3125	0.3125	0.5625	3.50
	203750-4.00	3/16	3/8	0.3750	0.3750	0.6875	4.00
	204375-4.00	7/32	7/16	0.4375	0.4375	0.6875	4.00
	205000-4.50	1/4	1/2	0.5000	0.5000	0.8750	4.50

CBNEA2000 (Long Neck Ball)



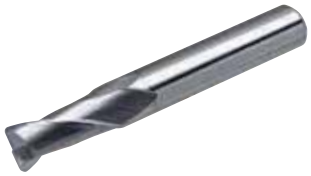
2 | H·A 30° | CrN | Substrate PC210C

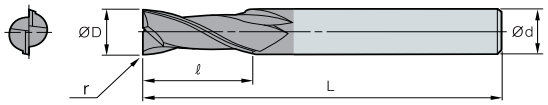
ØD	Tolerance	R Tolerance
Ø0.0313 ~Ø -0.2188	Ø0 ~ Ø -0.0004	±0.0002
Ø0.2500 ~Ø -0.5000	Ø0 ~ Ø -0.0004	±0.0002

(inch)

Designation		R	ØD		Ød	ℓ_1	ℓ_2	L
CBNEA 2	200313-2.00-N01576	1/64	1/32	0.0313	0.1250	0.0394	0.1576	2.00
	200313-2.00-N02364	1/64	1/32	0.0313	0.1250	0.0394	0.2364	2.00
	200313-2.00-N03152	1/64	1/32	0.0313	0.1250	0.0394	0.3152	2.00
	200313-2.00-N03940	1/64	1/32	0.0313	0.1250	0.0394	0.3940	2.00
	200625-2.00-N03152	1/32	1/16	0.0625	0.1250	0.0591	0.3152	2.00
	200625-2.00-N03940	1/32	1/16	0.0625	0.1250	0.0591	0.3940	2.00
	200625-2.00-N04728	1/32	1/16	0.0625	0.1250	0.0591	0.4728	2.00
	200625-2.00-N05516	1/32	1/16	0.0625	0.1250	0.0591	0.5516	2.00
	200938-2.00-N03152	3/64	3/32	0.0938	0.1250	0.0788	0.3152	2.00
	200938-2.00-N03940	3/64	3/32	0.0938	0.1250	0.0788	0.3940	2.00
	200938-2.00-N04728	3/64	3/32	0.0938	0.1250	0.0788	0.4728	2.00
	200938-2.00-N05516	3/64	3/32	0.0938	0.1250	0.0788	0.5516	2.00
	201250-2.00-N03940	1/16	1/8	0.1250	0.1875	0.1182	0.3940	2.00
	201250-2.00-N04728	1/16	1/8	0.1250	0.1875	0.1182	0.4728	2.00
	201250-2.00-N05516	1/16	1/8	0.1250	0.1875	0.1182	0.5516	2.00
	201250-2.00-N06304	1/16	1/8	0.1250	0.1875	0.1182	0.6304	2.00
	201562-2.50-N06304	5/64	5/32	0.1562	0.2500	0.1576	0.6304	2.50
	201562-2.50-N07880	5/64	5/32	0.1562	0.2500	0.1576	0.7880	2.50
	201562-3.00-N09850	5/64	5/32	0.1562	0.2500	0.1576	0.9850	3.00
	201562-3.00-N11820	5/64	5/32	0.1562	0.2500	0.1576	1.1820	3.00

CREA2000 (Radius)



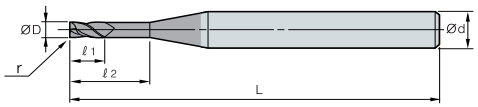


ØD	Tolerance
Ø0.0313~Ø0.2188	0 ~ - 0.004
Ø0.2500~Ø0.5000	0 ~ - 0.004

(inch)

Designation		r	ØD		Ød	ℓ	L
CREA	200938-2.00	0.02	3/32	0.0938	0.1250	0.2188	2.00
2	201250-2.00	0.02	1/8	0.1250	0.1250	0.3125	2.00
	201562-2.00	0.02	5/32	0.1562	0.1875	0.4375	2.00
	201875-2.50	0.02	3/16	0.1875	0.1875	0.5000	2.50
	202188-2.50	0.02	7/32	0.2188	0.2500	0.5000	2.50
	202500-2.50	0.02	1/4	0.2500	0.2500	0.5000	2.50
	202812-2.50	0.02	9/32	0.2812	0.3125	0.6250	2.50
	203125-2.50	0.04	5/16	0.3125	0.3125	0.7500	2.50
	203750-2.75	0.04	3/8	0.3750	0.3750	0.8750	2.75
	204375-2.75	0.04	7/16	0.4375	0.4375	0.8750	2.75
	205000-3.00	0.04	1/2	0.5000	0.5000	1.0000	3.00

CRNEA2000 (Long Neck Radius)



ØD	Tolerance
Ø0.0313~Ø0.2188	0 ~ - 0.004
Ø0.2500~Ø0.5000	0 ~ - 0.004

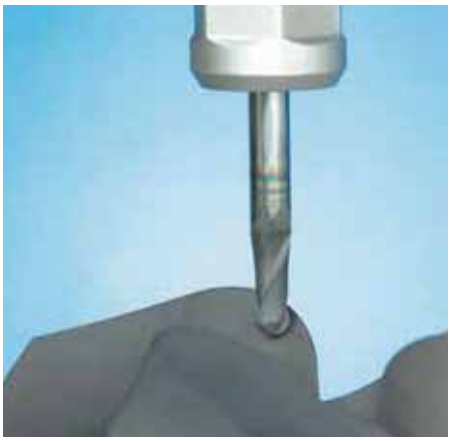
(inch)

Designation		r	ØD		Ød	ℓ_1	ℓ_2	L
CRNEA	200313-2.00-R.01N01576	0.01	1/32	0.0313	0.1250	0.0591	0.1576	2.00
2	200313-2.00-R.01N02364	0.01	1/32	0.0313	0.1250	0.0591	0.2364	2.00
	200313-2.00-R.01N03152	0.01	1/32	0.0313	0.1250	0.0591	0.3152	2.00
	200313-2.00-R.01N03940	0.01	1/32	0.0313	0.1250	0.0591	0.3940	2.00
	200625-2.00-R.01N02364	0.01	1/16	0.0625	0.1250	0.0906	0.2364	2.00
	200625-2.00-R.01N03152	0.01	1/16	0.0625	0.1250	0.0906	0.3152	2.00
	200625-2.00-R.01N03940	0.01	1/16	0.0625	0.1250	0.0906	0.3940	2.00
	200625-2.00-R.01N04728	0.01	1/16	0.0625	0.1250	0.0906	0.4728	2.00
	200938-2.00-R.02N02364	0.02	3/32	0.0938	0.1250	0.1182	0.2364	2.00
	200938-2.00-R.02N03152	0.02	3/32	0.0938	0.1250	0.1182	0.3152	2.00
	200938-2.00-R.02N03940	0.02	3/32	0.0938	0.1250	0.1182	0.3940	2.00
	200938-2.00-R.02N04728	0.02	3/32	0.0938	0.1250	0.1182	0.4728	2.00
	201250-2.00-R.02N03940	0.02	1/8	0.1250	0.1875	0.1773	0.3940	2.00
	201250-2.00-R.02N04728	0.02	1/8	0.1250	0.1875	0.1773	0.4728	2.00
	201250-2.50-R.02N05516	0.02	1/8	0.1250	0.1875	0.1773	0.5516	2.50
	201250-2.50-R.02N06304	0.02	1/8	0.1250	0.1875	0.1773	0.6304	2.50
	201562-2.00-R.02N04728	0.02	5/32	0.1562	0.2500	0.2364	0.4728	2.00
	201562-2.00-R.02N06304	0.02	5/32	0.1562	0.2500	0.2364	0.6304	2.00
	201562-2.50-R.02N07880	0.02	5/32	0.1562	0.2500	0.2364	0.7880	2.50

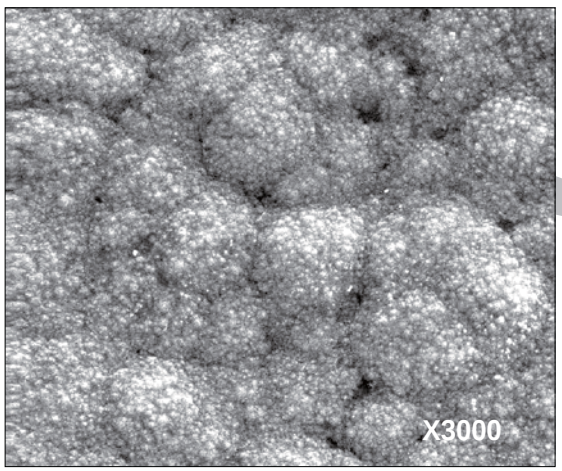
Unique diamond coating technology

D-Max

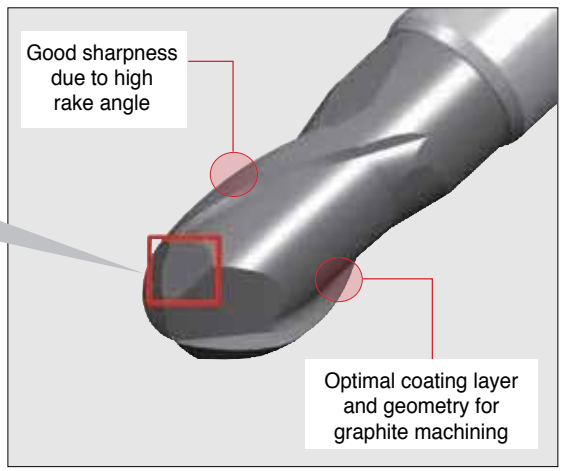
- Unique diamond coating technology
- Good surface roughness through improved endmill geometry and ultra fine substrate
- Wide cutting area from intermittent cutting to high precision cutting
- 10~20 times longer tool life than uncoated carbide endmill



Coating and Endmill geometry



ND3000 Coated

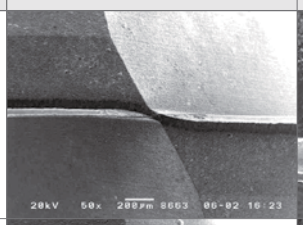
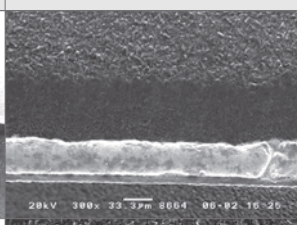
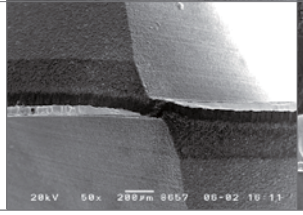
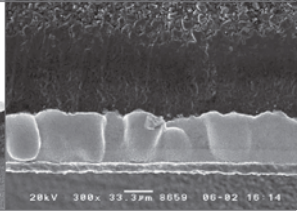


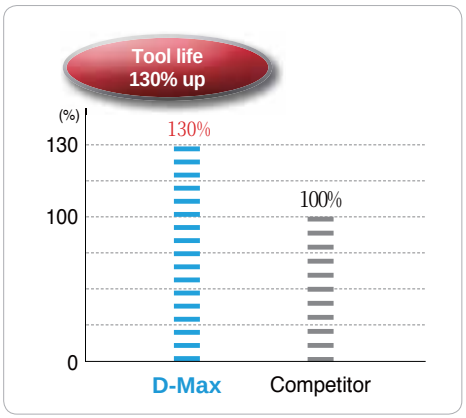
Machining example

• **Test result**

Workpiece: graphite

Cutting condition : **n**=16,000(mim^{-1}) **vf**=1.024(ipm) **ap**=0.06inch **ae**=0.02inch

	Wear	Detail Wear
D-Max		
Competitor		



Recommended Cutting Condition (DFE2000 Flat)

Workpiece / Condition / Diameter(Ø)	Graphite		Aluminum alloys		Copper alloys	
	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)
1/8	21,000	50.394	21,000	26.378	21,000	25.197
3/16	16,000	46.457	16,000	26.378	16,000	25.197
1/4	10,500	46.457	10,500	26.378	10,500	22.047
5/16	8,000	42.520	8,000	23.622	8,000	21.260

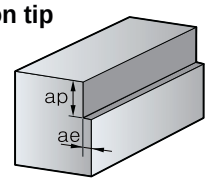
Recommended Cutting Condition (DBE2000 Ball)

Workpiece / Condition / Diameter(Ø)	Graphite		Aluminum alloys		Copper alloys	
	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)
3/16	15,000	74.803	15,900	61.024	11,900	45.276
1/4	15,000	74.803	10,500	61.024	7,950	45.276
5/16	13,900	74.803	7,950	61.024	5,950	45.276

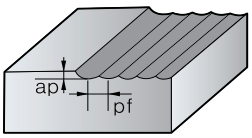
Recommended Cutting Condition (DRE2000 Radius)

Workpiece / Condition / Diameter(Ø)	Graphite		Aluminum alloys		Copper alloys	
	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)	R.P.M $n(min^{-1})$	Feed vf(ipm)
3/16	13,990	46.457	15,900	26.378	11,990	25.197
1/4	13,900	46.457	10,500	26.378	7,950	22.047
5/16	10,000	42.520	7,950	23.622	5,950	21.260

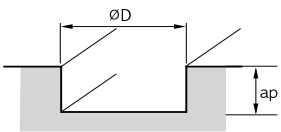
● **Application tip**



- **Graphite**
  ap=1.5D, ae=0.1D
- **Aluminum alloys**
  ap=1.5D, pf=0.1D
- **Copper alloys**
  ap=1.5D, pf=0.1D

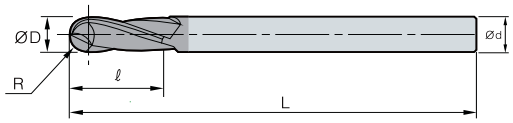


- **Graphite**
  ap=0.5D, pf=0.1D
- **Aluminum alloys**
  ap=0.5D, pf=0.1D
- **Copper alloys**
  ap=0.5D, pf=0.1D



- **Graphite**
  ap=0.1D
- **Aluminum alloys**
  ap=0.1D
- **Copper alloys**
  ap=0.1D

DBEA2000 (Ball)

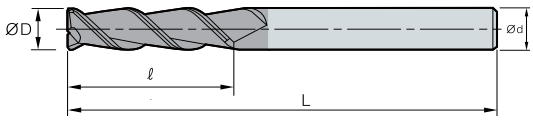


2 | H·A 30° | Dia | Substrate ND3000

(inch)

	Designation	R	ØD		Ød	ℓ	L
DBEA	201250-2.75	1/16	1/8	0.1250	0.1250	0.5000	2.75
2	201875-2.75	3/32	3/16	0.1875	0.1875	0.5000	2.75
	202500-3.00	1/8	1/4	0.2500	0.2500	0.6250	3.00
	203125-3.50	5/32	5/16	0.3125	0.3125	0.7500	3.50

DFEA2000 (Flat)

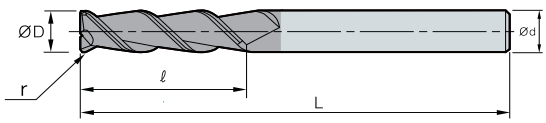


2 | H·A 30° | Dia | Substrate ND3000

(inch)

	Designation	ØD		Ød	ℓ	L
DFEA	201250-2.00-R.02	1/8	0.1250	0.1250	0.3750	2.00
2	201875-2.00-R.02	3/16	0.1875	0.1875	0.5000	2.00
	202500-2.00-R.02	1/4	0.2500	0.2500	0.6250	2.00
	203125-2.50-R.04	5/16	0.3125	0.3125	0.7500	2.50

DREA2000 (Radius)



2 | H·A 30° | Dia | Substrate ND3000

(inch)

	Designation	r	ØD		Ød	ℓ	L
DREA	201875-2.00-R.02	0.02	3/16	0.1875	0.1875	0.2188	2.00
2	202500-2.00-R.02	0.02	1/4	0.2500	0.2500	0.2812	2.00
	203125-2.50-R.04	0.04	5/16	0.3125	0.3125	0.3750	2.50

Longer tool life and good surface finishes

PCD Endmills

- Longer tool life and good surface roughness
- Reducing burrs at nonferrous metals machining
- 1000 series : Ultra finishing for nonferrous metals
- 2000 series : Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

PCD Endmill Code System

PDEA	2	03750
Endmill	**No. of Flute**	**Diameter**
PDE : PCD Endmill	2 Flutes	03750 : Ø0.3750

Recommended Cutting Condition

Work piece	vc(sfm)	n(min^{-1})	fz(ipt)
Aluminum Alloy, Copper	100~985	2,000~12,000	0.008~0.0028
Reinforced Plastic	115~985	2,800~16,000	0.0016~0.0047
Carbon steel, Graphite	35~330	5,300~16,000	0.0016~0.0080

Special Endmill Order Form

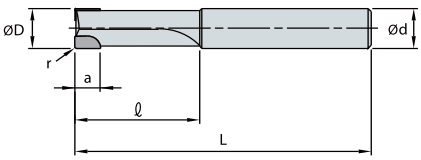


Fig.1

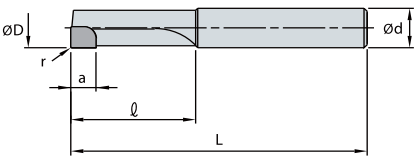
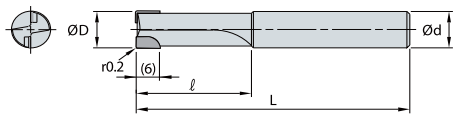


Fig.2

Designation	Fig.	No. of Flute	Dimension (mm)					
			ØD	Ød	r	a	ℓ	L
PDEAS								

※ Depending on customer requests, we can make special Endmill

PDEA1000/2000 (Flat)



(inch)

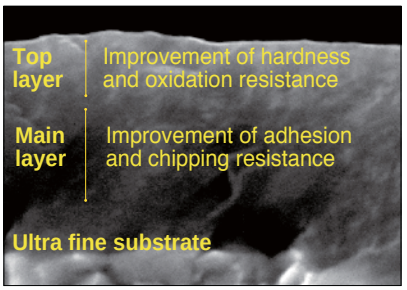
Designation		ØD	Ød	ℓ	L
PDEA	101875	0.1875	0.1875	0.63	2.0
PDEA	202500	0.2500	0.2500	0.75	2.25
	203130	0.3130	0.3750	0.75	2.50
	203750	0.3750	0.3750	1.00	2.75
	205000	0.5000	0.5000	1.00	3.00

High precision machining with our high stiffness design

Brazed Endmills

- Possible to machine with high precision due to high stiffness design
- High speed cutting by increasing wear resistance, decreasing frictional resistance through PVD coating and substrate
- Long tool life due to absorbing impact through brazed body in heavy interruption
- General steel, Alloy steel, mild steel, dice steel, stainless steel, cast iron, ductile cast iron
- ZSEA: Aluminum, Aluminum alloy, Cooper, Cooper alloy, Non-ferrous materials
- Coating brazed endmills (special)
  Guaranteed long tool life due to high new-concept hardness and oxidation resistant coating

PC221F Coating



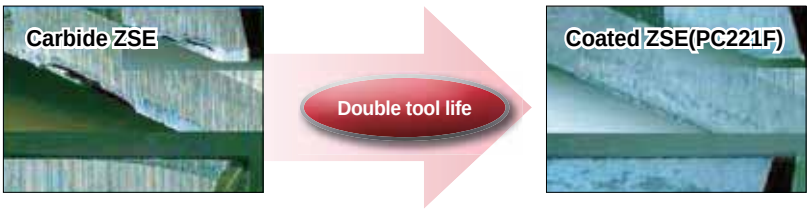
New PVD films
New hardness and oxidation resistance coating

Brazed Endmills Code System

Z S E 2 14 - S

Brazed	Spiral	Endmill	No. of Flutes	Diameter	Shank Dia.
		E : Flat (Steel) **EA** : Flat (Al, Cu) **EL** : Flat Long (Steel) **EXL** : Flat Long (Steel) **BE** : Ball (Steel)	**2** : 2 Flutes **3** : 3 Flutes	Ø14	**S** : Ø42.0 **Q** : Coated **SQ** : Ø42.0 Coated **Standard Shank Diameter** : none

Wear resistance test (W.P:STD61)



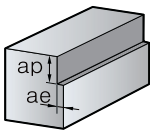
Recommended Cutting Condition (ZSE200 Flat)

Workpiece / Condition / Diameter(Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
20	1,600	152	950	88	560	44
25	1,300	136	750	72	450	36
30	1,100	120	650	64	370	32
40	800	96	500	56	280	24
50	650	88	400	48	220	20

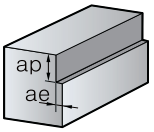
Recommended Cutting Condition (ZSE400 Flat)

Workpiece / Condition / Diameter(Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)	R.P.M n(min-1)	Feed vf(mm/min)
20	1,600	230	950	133	560	66
25	1,300	205	750	109	450	54
30	1,100	180	650	96	370	48
40	800	145	500	85	280	36
50	650	135	400	72	220	30

Application tip



■Side milling (under HRC45)
· ap≤1.5D · ae≤0.1D

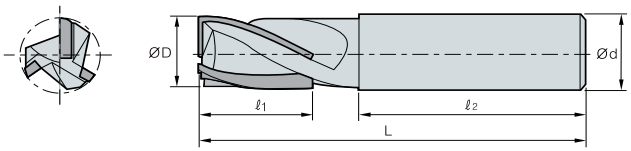


■Side milling (over HRC45)
· ap≤1D(Max : 1mm)

- Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
- When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

M This is metric size. We can also provide in inch type

ZSE200/300 (Flat)



2 | 3 | H-A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0 ~ - 0.050

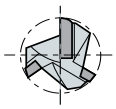
(mm)

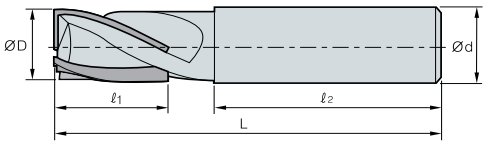
Designation		ØD	Ød	ℓ_1	ℓ_2	L
ZSE 2	214	14	16	28	57	95
	215	15	16	28	57	95
	216(Q)	16	16	28	55	95
	217	17	20	30	70	115
	218	18	20	30	70	115
	219	19	20	30	70	115
	220(Q)	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	226(Q)	26	25	35	75	125
	227	27	25	35	75	125
	228	28	25	35	75	125
	229	29	32	40	95	150
	230(Q)	30	32	40	95	150
	231	31	32	40	95	150
	232	32	32	45	90	150
	233	33	32	45	90	150
	234	34	32	50	85	150
	235	35	32	50	85	150
	236	36	32	50	85	150
	237	37	32	55	80	150
	238	38	32	55	80	150
	238S	38	42	55	80	150
	240(Q)	40	32	60	75	150
	240S	40	42	60	75	150
	242	42	32	60	75	150
	244	44	32	65	80	160
	245	45	32	65	80	160
	245S	45	42	65	80	160
	247	47	32	65	80	160
	248	48	32	65	80	160
	248S	48	42	65	80	160
	250	50	32	65	80	160
	250S	50	42	65	80	160
ZSE 3	314	14	16	28	57	95
	315	15	16	28	57	95
	316	16	16	28	55	95
	317	17	20	30	70	115
	318	18	20	30	70	115
	319	19	20	30	70	115
	320	20	20	30	70	115
	322	22	20	35	65	115
	325	25	25	35	75	125
	326	26	25	35	75	125
	328	28	25	35	75	125
	330	30	32	40	95	150
	331	31	32	40	95	150

Special Endmills order : ZSE◎◎◎◎I-L
Ex.1) 2 flutes, diameter : 6.3, I : 10, L : 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter : 6.3, standard type ZSE2063

M This is metric size. We can also provide in inch type

ZSE300/400/600 (Flat)





3 4 6 H·A 24°~26° Carbide Substrate FCC PC221F

ØD	Tolerance
All	0 ~ - 0.050

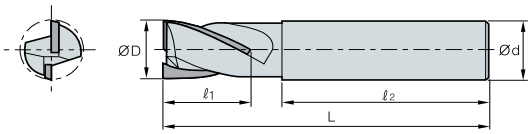
(mm)

Designation		ØD	Ød	ℓ_1	ℓ_2	L
ZSE	332	32	32	45	90	150
	333	33	32	45	90	150
3	334	34	32	50	85	150
	335	35	32	50	85	150
	338	38	32	55	80	150
	338S	38	42	55	80	150
	340	40	32	60	75	150
	340S	40	42	60	75	150
	342	42	32	60	75	150
	345	45	32	65	80	160
	345S	45	42	65	80	160
	350	50	32	65	80	160
	350S	50	42	65	80	160
ZSE	414	14	16	28	57	95
	415	15	16	28	57	95
	416(Q)	16	16	28	55	95
4	417	17	20	30	70	115
	418	18	20	30	70	115
	419	19	20	30	70	115
	420(Q)	20	20	30	70	115
	421	21	20	35	65	115
	422	22	20	35	65	115
	423	23	25	35	75	125
	424	24	25	35	75	125
	425(Q)	25	25	35	75	125
	426	26	25	35	75	125
	427	27	25	35	75	125
	428	28	25	35	75	125
	429	29	32	40	95	150
	430	30	32	40	95	150
	432(Q)	32	32	45	90	150
	435	35	32	50	80	150
	438	38	32	55	85	150
	438S	38	42	55	85	150
	440(Q)	40	32	60	75	150
	440S	40	42	60	75	150
	445	45	32	65	80	160
	445S	45	42	65	80	160
	450	50	32	65	80	160
	450S	50	42	65	80	160
ZSE	634	34	32	50	85	150
	635	35	32	50	85	150
	638	38	32	55	80	150
	638S	38	42	55	80	150
6	640	40	32	60	75	150
	640S	40	42	60	75	150
	645	45	32	65	80	160
	645S	45	42	65	80	160
	650	50	32	65	80	160
	650S	50	42	65	80	160

Special Endmills order : ZSE○○○○I-L
Ex.1) 2 flutes, diameter : 6.3, I : 10, L : 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter : 6.3, standard type ZSE2063

M This is metric size. We can also provide in inch type

ZSEA200 (Flat)



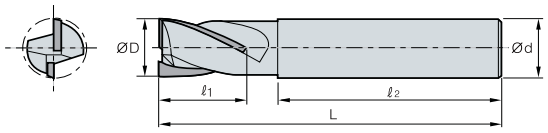
ØD	Tolerance
All	0 ~ - 0.050

(mm)

Designation		ØD	Ød	ℓ_1	ℓ_2	L
ZSEA	215	15	16	28	57	95
2	216	16	16	28	55	95
	218	18	20	30	70	115
	219	19	20	30	70	115
	220	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	228	28	25	35	75	125
	230	30	32	40	95	150
	232	32	32	45	90	150
	238	38	32	55	80	150
	240	40	32	60	75	150
	250	50	32	65	80	160

M This is metric size. We can also provide in inch type

ZSEL, ZSEXL (Flat)



2 | 4 | H·A 24°~26° | Carbide | Substrate FCC PC221F

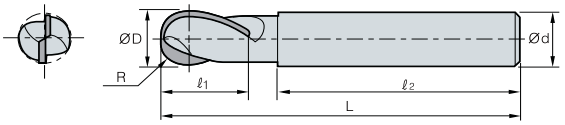
ØD	Tolerance
All	0 ~ - 0.050

(mm)

Designation		ØD	Ød	ℓ_1	ℓ_2	L
ZSEL 2	214	14	16	50	55	120
	216	16	16	50	55	120
	218	18	20	60	65	140
	220	20	20	60	65	140
	222	22	20	60	65	140
	225	25	25	70	65	150
	230	30	32	80	85	180
	232	32	32	90	85	190
	235	35	32	100	85	200
	240	40	42	100	105	220
	245	45	42	120	95	230
	250	50	42	120	95	230
ZSEL 4	416	16	16	50	55	120
	420	20	20	60	65	140
	425	25	25	70	65	150
	430	30	32	80	85	180
	435	35	32	100	85	200
	440	40	42	100	105	220
ZSEXL 2	220	20	20	120	65	200
	222	22	20	120	65	200
	225	25	25	140	65	220

M This is metric size. We can also provide in inch type

ZSBE200 (Ball)



2 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0 ~ - 0.050

(mm)

Designation		R	ØD	Ød	ℓ_1	ℓ_2	L
ZSBE	213	6.5	13	16	30	60	100
2	214	7	14	16	30	65	100
	215	7.5	15	16	35	55	100
	216Q	8	16	16	35	55	100
	217	8.5	17	20	35	65	110
	218	9	18	20	35	65	110
	219	9.5	19	20	35	65	110
	220Q	10	20	20	35	65	110
	221	10.5	21	20	35	65	110
	222	11	22	20	35	65	110
	223	11.5	23	25	40	65	120
	224	12	24	25	40	70	120
	225	12.5	25	25	40	70	120
	230	15	30	32	40	70	130
	231	15.5	31	32	40	80	130
	232	16	32	32	50	75	140
	233	16.5	33	32	50	75	140
	234	17	34	32	50	85	150
	235	17.5	35	32	50	85	150
	235S	17.5	35	42	50	85	150
	236	18	36	32	50	85	150
	236S	18	36	42	50	85	150
	237	18.5	37	32	50	95	160
	237S	18.5	37	42	50	95	160
	238	19	38	32	50	95	160
	238S	19	38	42	50	95	160
	239	19.5	39	32	50	95	160
	239S	19.5	39	42	50	95	160
	240	20	40	32	50	95	160
	240S	20	40	42	50	95	160
	245	22.5	45	32	50	105	170
	245S	22.5	45	42	50	105	170
	250	25	50	32	50	105	170
	250S	25	50	42	50	105	170

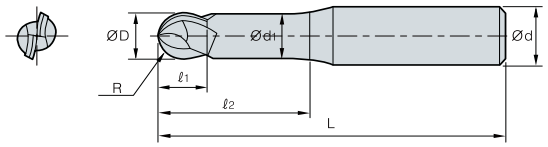
M This is metric size. We can also provide in inch type

- **ZSBE200**
  Special Endmills order : ZSBE2◎◎l-L
  Ex 1) 2 flutes diameter : 6 3 l: 10 L: 60 ZSBE 206310-60L
  Ex.2) 2 flutes, diameter : 6.3, standard type ZSBE2063

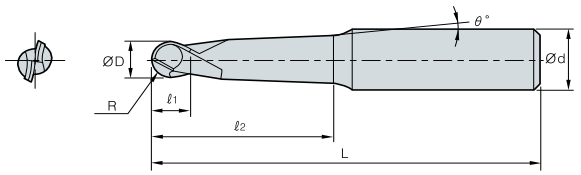
- **ZSEA200**
  Special Endmills order : ZSEA2◎◎l-L
  Ex.1) 2 flutes, diameter : 16.3, l:28, L:95 ZSEA2163 28-95L
  Ex.2) 2 flutes, diameter : 17.0, standard type ZSEA2170

- **ZSEL200/400, ZSEXL200**
  Special Endmills orde r: ZSEL◎◎◎l-L

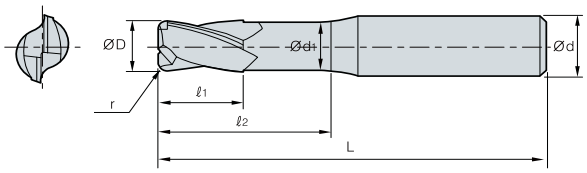
F Special Endmill order form



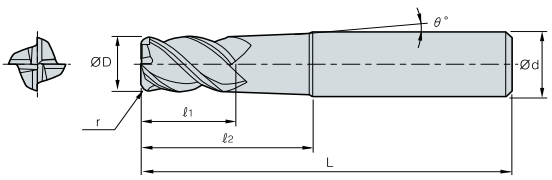
Designation	Flute	R	ØD	Ød	Ød1	ℓ1	ℓ2	L



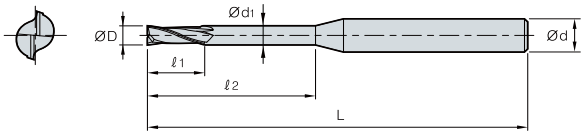
Designation	Flute	R	ØD	Ød	ℓ1	ℓ2	L	θ°



Designation	Flute	ØD	Ød	Ød1	r	ℓ1	ℓ2	L



Designation	Flute	ØD	r	Ød	ℓ1	ℓ2	L	θ°



Designation	Flute	ØD	Ød	Ød1	ℓ1	ℓ2	L

G

DRILLS

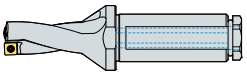
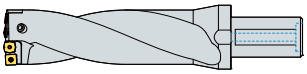
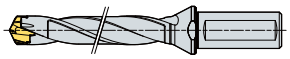
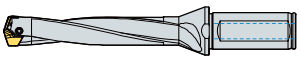
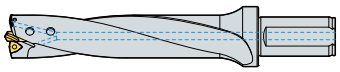
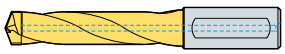
Korloy drills provides total solutions in hole making based on development, research and tooling know-how.

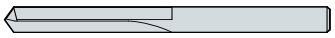
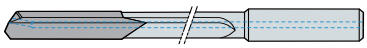
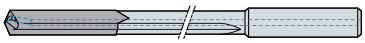
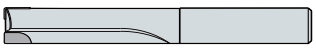
Technical Information for Drills

Indexable Drills

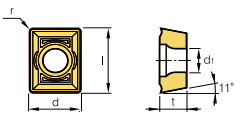
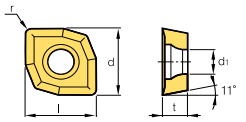
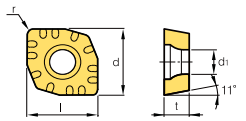
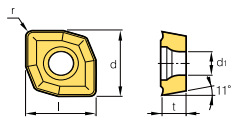
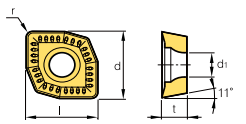
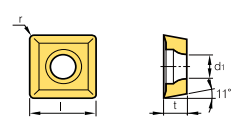
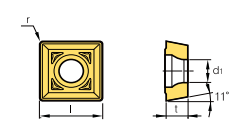
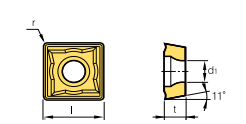
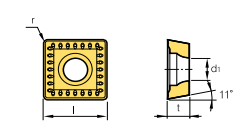
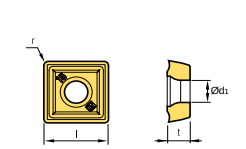
Solid Drills

Reamer

Type	Designation		Shape	Drills Dia.	Aspect ratio	Page
	KING-DRILL HP	K□D..HP	 Available Insert : SP□T, XO□T	Ø0.484~Ø2.375	2D~5D	G12 ~ G15
	KING-DRILL (for large diameter drilling) New	K□D	 Available Insert : SP□T, XO□T	Ø2.40~Ø3.94	2D~4D	G17
	TPDC New	TPDC	 Available Insert : TPD□□□□CP	Ø0.472~Ø0.786	3D~8D	G22
	TPDB New	TPDB	 Available Insert : TPD□□□B	Ø0.394~Ø1.298	3D~8D	G27 ~ G29
	Indexable Drills & Drill with center	WPDC	 Available Insert : WC□T	Ø1.000~Ø3.130	5D~8D	G34 ~ G35
Solid Drills	Mach Drill Plus New	MSDP		Ø0.0394~ Ø0.7874	3D~7D	G38
		MSDPH		Ø0.0984~ Ø0.7874	3D~7D	G39 ~ G42
	Mach Drill	MSD		Ø0.2188 ~ Ø0.7500	3D~7D	G48
		MSDH		Ø0.2188 ~ Ø0.7500	3D~7D	G49
	Mach long Drill Plus New	MLD□□□□N		Ø0.1181~ Ø0.3937	10D~25D	G52 ~ G54
	Mach long Drill	MLDP		Ø0.2188 ~ Ø0.3750	-	G57
		MLD		Ø0.2188 ~ Ø0.3750	10D~25D	G57
	Vulcan Drill	VZD		Ø12.6~Ø40.5	2.5D, 5D	G60~ G61
	Carbide Drill	SSD		Ø0.0312 ~ Ø0.1562	-	G63

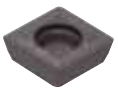
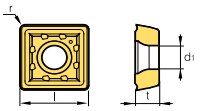
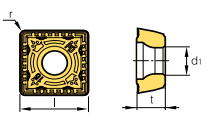
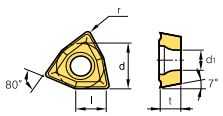
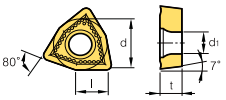
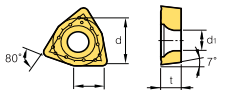
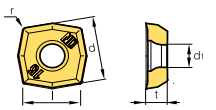
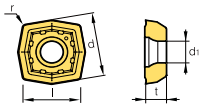
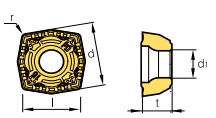
Type	Designation		Shape	Drills Dia.	Aspect ratio	Page
Solid Drills	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	G64
		BDT		Ø4.2~Ø10.3	2D~4D	G64
	Top solid Drill	TSDM		Ø0.3150 ~ Ø0.9840	5D~8D	G65
	PCD Drill	PDD		Ø0.1875 ~ Ø0.5000	5D	G66
	Gun Drill	KGDS		Ø0.079 ~ Ø1.299	50D~100D	G71
		KGDT		Ø0.236 ~ Ø1.043	50D~100D	G72
Reamer	Indexable Reamer	IRT	 Available Insert : RI	Ø0.375 ~ Ø1.250	3D~5D	G77
		IRB	 Available Insert : RI	Ø0.375 ~ Ø1.250	3D~5D	G77
	Chucking / Machine Reamer	SCRS		Ø5.0~Ø20.0 M This is metric size.	2D~3D	G79
		SCRH		Ø5.0~Ø20.0 M This is metric size.	2D~3D	G79
		TCRS		Ø7.0~Ø30.0 M This is metric size.	2D~3D	G80
		TMRS		Ø7.0~Ø30.0 M This is metric size.	3D~5D	G80
	PCD Reamer	PDR		Ø0.2187~ Ø0.7500	3D~5D	G81

Available Insert

Picture	Designation	Coated											Uncoated		Dimensions (inch)					Geometry	Page
		NC3120	NC3030	NC5330	PC5300	PC3530	PC3535	PC3500	NCM325	PC9530	NCM335	PC6510	H01	G10	l	d	t	r	d_1		
LPMT-DF	040203-DF														0.244	0.185	0.094	0.012	0.091		-
NPET-DA	222408-DA														0.327	0.323	0.098	1/32	1.110		-
	252808-DA														0.366	0.362	0.13	1/32	0.134		
	293208-DA														0.406	0.402	0.13	1/32	0.134		
	334008-DA														0.512	0.508	5/32	1/32	0.157		
	415008-DA														0.602	0.598	0.187	1/32	0.177		
	516012-DA														0.720	0.717	0.204	3/64	0.217		
NPET-DR	222408-DR														0.327	0.323	0.098	1/32	1.110		-
	252808-DR														0.366	0.362	0.13	1/32	0.134		
	293208-DR														0.406	0.402	0.13	1/32	0.134		
	334008-DR														0.512	0.508	5/32	1/32	0.157		
	415008-DR														0.602	0.598	0.187	1/32	0.177		
	516012-DR														0.720	0.717	0.204	3/64	0.217		
NPMT-DM	222408-DM														0.327	0.323	0.098	1/32	1.110		-
	252808-DM														0.366	0.362	0.13	1/32	0.134		
	293208-DM														0.406	0.402	0.13	1/32	0.134		
	334008-DM														0.512	0.508	5/32	1/32	0.157		
	415008-DM														0.602	0.598	0.187	1/32	0.177		
	516012-DM														0.720	0.717	0.204	3/64	0.217		
NPMT-DS	222408-DS														0.327	0.323	0.098	1/32	1.110		-
	252808-DS														0.366	0.362	0.130	1/32	0.134		
	293208-DS														0.406	0.402	0.130	1/32	0.134		
	334008-DS														0.512	0.508	5/32	1/32	0.157		
	415008-DS														0.602	0.598	0.187	1/32	0.177		
	516012-DS														0.720	0.717	0.204	3/64	0.217		
SPET-DA	050203-DA														0.209	-	0.094	0.012	0.091		-
	060204-DA														0.244	-	0.098	1/64	0.098		
	070204-DA														0.283	-	0.098	1/64	0.110		
SPMT-DF	050203-DF														0.209	-	0.094	0.012	0.091		-
	060204-DF														0.244	-	0.098	1/64	0.098		
	070204-DF														0.283	-	0.098	1/64	0.110		
SPMT-DM	050203-DM														0.209	-	0.094	0.012	0.091		-
	060204-DM														0.244	-	0.098	1/64	0.098		
	070204-DM														0.283	-	0.098	1/64	0.110		
SPMT-DS	050203-DS														0.209	-	0.094	0.012	0.091		-
	060204-DS														0.244	-	0.098	1/64	0.098		
	070204-DS														0.283	-	0.098	1/64	0.110		
SPET-ND	040204-ND												●		0.185	-	0.094	0.016	0.091		G12 ~ G15
	050204-ND												●		0.201	-	0.094	0.016	0.091		
	060205-ND												●		0.244	-	0.098	0.020	0.098		
	07T208-ND												●		0.295	-	0.110	0.028	0.110		
	090308-ND												●		0.362	-	0.130	0.031	0.134		
	11T308-ND												●		0.433	-	0.157	0.031	0.157		
	130410-ND												●		0.512	-	0.177	0.039	0.177		
	15M510-ND												●		0.598	-	0.197	0.039	0.217		
	180510-ND												●		0.717	-	0.217	0.039	0.236		

● : Stock Item

Available Insert

Picture	Designation	Coated												Uncoated		Dimensions (inch)					Geometry	Page
		NC3120	NC3220	NC3030	NC5330	PC5300	PC5335	PC3530	PC3500	NCM325	PC9530	NCM335	PC6510	H01	G10	l	d	t	r	d_1		
New SPMT-LD 	060205-LD															0.244	-	0.098	0.020	0.098		G12 ~ G15
	07T208-LD															0.295	-	0.110	0.028	0.110		
	090308-LD															0.362	-	0.130	0.031	0.134		
	11T308-LD															0.433	-	0.157	0.031	0.157		
	130410-LD															0.512	-	0.177	0.039	0.177		
	15M510-LD															0.598	-	0.197	0.039	0.217		
	180510-LD															0.717	-	0.217	0.039	0.236		
New SPMT-PD 	040204-PD															0.185	-	0.094	0.016	0.091		G12 ~ G15
	050204-PD															0.201	-	0.094	0.016	0.091		
	060205-PD															0.244	-	0.098	0.020	0.098		
	07T208-PD															0.295	-	0.110	0.028	0.110		
	090308-PD															0.362	-	0.130	0.031	0.134		
	11T308-PD															0.433	-	0.157	0.031	0.157		
	130410-PD															0.512	-	0.177	0.039	0.177		
	15M510-PD															0.598	-	0.197	0.039	0.217		
	180510-PD															0.717	-	0.217	0.039	0.236		
WCKT-C21 	030204-C21															0.150	7/32	3/32	1/64	0.098		G34 ~ G35
	040204-C21															0.169	1/4	3/32	1/64	0.110		
	050308-C21															0.213	5/16	1/8	1/32	0.134		
	06T308-C21															0.256	3/8	5/32	1/32	0.173		
	080408-C21															0.343	1/2	3/16	1/32	0.217		
New WCMT-C20N 	030208-C20N															0.150	7/32	3/32	1/32	0.110		G34 ~ G35
	040208-C20N															0.169	1/4	3/32	1/32	0.118		
	050308-C20N															0.213	5/16	1/8	1/32	0.134		
	06T308-C20N															0.256	3/8	5/32	1/32	0.146		
	080408-C20N															0.343	1/2	3/16	1/32	0.169		
	080412-C20N															0.343	1/2	3/16	3/64	0.169		
New WCMT-C21N 	030204-C21N															0.150	7/32	3/32	1/64	0.100		G34 ~ G35
	040204-C21N															0.169	1/4	3/32	1/64	0.110		
	040208-C21N															0.169	1/4	3/32	1/32	0.110		
	050308-C21N															0.213	5/16	1/8	1/32	0.134		
	06T308-C21N															0.256	3/8	5/32	1/32	0.173		
	080408-C21N															0.343	1/2	3/16	1/32	0.217		
New XOET-ND 	040204-ND															0.169	0.193	0.094	0.016	0.091		-
	050204-ND															0.189	0.213	0.094	0.016	0.091		
	060204-ND															0.228	0.260	0.098	0.016	0.098		
	07T205-ND															0.272	0.307	0.110	0.020	0.110		
	090305-ND															0.331	0.378	0.130	0.020	0.134		
	11T306-ND															0.394	0.449	0.157	0.024	0.157		
	130406-ND															0.469	0.535	0.177	0.024	0.177		
	15M508-ND															0.547	0.626	0.197	0.031	0.217		
	180508-ND															0.650	0.744	0.217	0.031	0.236		
New XOMT-LD 	060204-LD															0.228	0.260	0.098	0.016	0.098		G12 ~ G15
	07T205-LD															0.272	0.307	0.110	0.020	0.110		
	090305-LD															0.331	0.378	0.130	0.020	0.134		
	11T306-LD															0.394	0.449	0.157	0.024	0.157		
	130406-LD															0.469	0.535	0.177	0.024	0.177		
	15M508-LD															0.547	0.626	0.197	0.031	0.217		
	180508-LD															0.650	0.744	0.217	0.031	0.236		
New XOMT-PD 	040204-PD															0.169	0.193	0.094	0.016	0.091		G12 ~ G15
	050204-PD															0.189	0.213	0.094	0.016	0.091		
	060204-PD															0.228	0.260	0.098	0.016	0.098		
	07T205-PD															0.272	0.307	0.110	0.020	0.110		
	090305-PD															0.331	0.378	0.130	0.020	0.134		
	11T306-PD															0.394	0.449	0.157	0.024	0.157		
	130406-PD															0.469	0.535	0.177	0.024	0.177		
	15M508-PD															0.547	0.626	0.197	0.031	0.217		
	180508-PD															0.650	0.744	0.217	0.031	0.236		

● : Stock Item

Optimized insert design for maximum drilling efficiency

KING DRILL New

Code system of holder

K 5D A 1000 125 □ – 07

KING / KORLOY

Aspect ratio(L/D)
2D, 2.5D, 3D, 3.5D,
4D, 4.5D, 5D

Type
A : Inch Type
No mark : Metric Type

Drill Dia.
Ø1.000
(Three decimal place marked)

Shank Dia.
Ø0.75, Ø1.00
Ø1.25, Ø1.50
Two decimal place marked

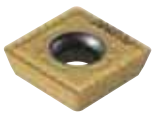
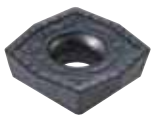
Shank shape
No mark : Flange Shank, Weldone
HP : Flange Shank, Weldon, PT Tap
F1 : Flange Shank, Whistle Notch
F2 : Flange Shank, Without Side Lock
S : Straight Shank, Weldone
S1 : Straight Shank, Whistle Notch
S2 : Straight Shank, Without Side Lock
M0, M1, M2, M3... : MT0, MT1, MT2, MT3...
H63, H100 : HSK63, HSK100
B30, B40, B50 : BT30, BT40, BT50

Inscribed circle of insert
05, 06, 07, 09
11 13, 15, 18

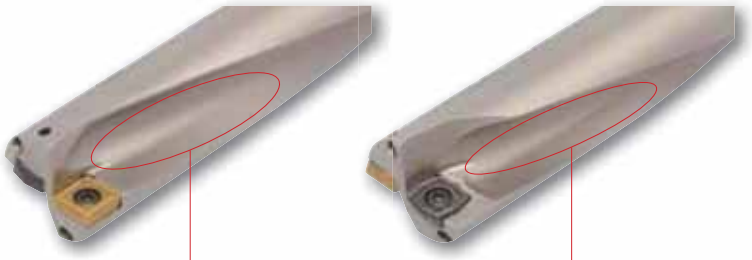
Features of Insert

Optimized design of inserts for maximum drilling efficiency

▶ Excellent cutting performance and chip control due to the optimized geometry and chip breaker of both inserts, central & peripheral.
▶ Different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life.

Chip breaker	PD		LD		ND	
Features	- Universal - At medium speed and medium feed		- Superior chip control for machining mild steel and stainless steel - Light cutting(at low ~ medium speed and low feed)		- Sharp cutting edge for aluminum machining - Insert surface buffed for high quality result	
Insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Peripheral insert	Central insert
Shape						
Grades for workpiece	NC5330 : P, M, K PC3500 : P PC5300 : P, M, K, S PC6510 : K	PC5300 : P, M, K, S	PC5335 : P, M	PC5335 : P, M	H01 : N	H01 : N

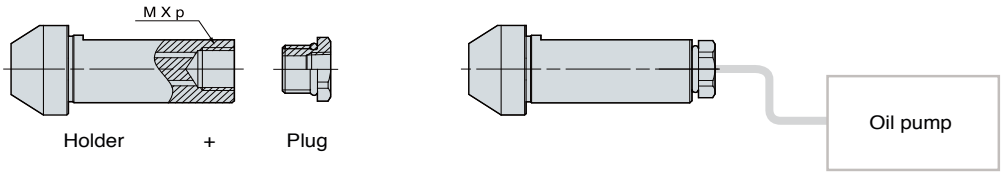
Optimized flute system - 2 coolant holes applied



The optimized shape of the flute increases the rigidity of the drill body and improves chip evacuation

KING DRILL- With Through Coolant System for Lathe

- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- NPT Tap in the plug is combined to NPT Tap connected to oil hose.
- Available to use the drill without a plug in milling machine.

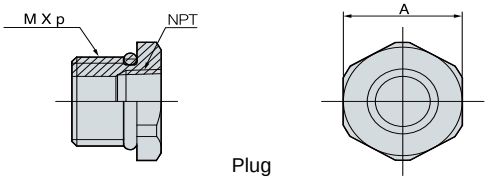


- Clamping oil hose to the bottom of plug and connect the oil pump to the holder

(inch)

Designation	Diameter	Shank Dia.	M x p	Plug
K□DA0484075~0625075HP-□□	Ø0.484 ~ Ø0.625	Ø0.75	M12 x 1.5	PLG12NPT18
K□DA0687100~0875100HP-□□	Ø0.687 ~ Ø0.875	Ø1.00	M16 x 1.5	PLG16NPT18
K□DA0937125~1375125HP-□□	Ø0.937 ~ Ø1.375	Ø1.25	M20 x 2.0	PLG20NPT14
K□DA1437150~2375150HP-□□	Ø1.437 ~ Ø2.375	Ø1.50	M27 x 2.0	PLG27NPT38

- Assembled plug

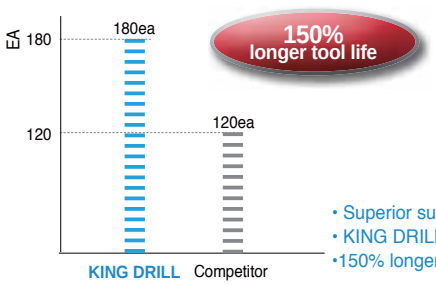


Plug Type	M x p	NPT Tap	A
PLG12NPT18	M12 x 1.5	1/8	5/8
PLG16NPT18	M16 x 1.5	1/8	7/8
PLG20NPT14	M20 x 2.0	1/4	1 1/8
PLG27NPT38	M27 x 2.0	3/8	11/8

Application examples

Track link bush

- **Workpiece** : Track link bush(AISI4140)
- **Cutting condition** : vc(sfm)=394, fn(ipr)=0.0039
  Through coolant system
- **Tools : Applicable inserts** SPMT07T208-PD(PC3500)
  XOMT07T205-PD(PC5300)
  Holder K5DA0812100HP-07
- **Machine** : drilling machine

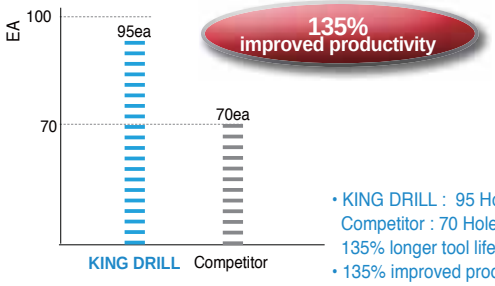


workpiece

- Superior surface finish and chip evacuation.
- KING DRILL: 180ea, Competitor:120ea
- 150% longer tool life.

Track link bush

- **Workpiece** : Track link bush(AISI4130)
- **Cutting condition** : Competitor's vc(sfm)=459, fn(ipr)=0.0039
  Korloy's vc(sfm)=459, fn(ipr)=0.0047
- **Tools : Applicable inserts** SPMT090308-PD(PC3500)
  XOMT090305-PD(PC5300)
  Holder K3DA1062125HP-09
- **Machine** : MCT



workpiece

- KING DRILL : 95 Holes,
  Competitor : 70 Holes,
  135% longer tool life.
- 135% improved productivity.

Recommended cutting condition

(inch)

Workpiece				Insert			vc (sfm)	Feed(aspect ratio=2D, 3D, 4D)				
				Chip Breaker	Grade			Fn(ipr) depending on drill Dia.				
ISO	Workpiece		Hardness(HB)		Central	Peripheral		0.47~0.63	0.64~0.91	0.92~1.14	1.15~1.65	1.66~2.36
P	Carbon steel	Low carbon steel	80~180	LD	PC5335	PC5335	394(197~558)	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031	0.0031~0.0016	0.0016~0.0031
				PD	PC5300	PC3500	492(394~591)					
						NC5330	591(459~722)					
		High carbon	180~280	PD	PC5300	PC3500	394(295~492)	0.0016~0.0039	0.0016~0.0047	0.0024~0.0063	0.0047~0.0024	0.0024~0.0071
						NC5330	492(361~623)	0.0016~0.0024	0.0016~0.0028	0.0016~0.0031	0.0028~0.0016	0.0016~0.0031
	Alloy steel	Low alloy steel	140~260	LD	PC5335	PC5335	394(197~525)	0.0024~0.0039	0.0024~0.0039	0.0024~0.0055	0.0039~0.0024	0.0024~0.0055
				PD	PC3500	PC3500	492(394~558)	0.0024~0.0047	0.0024~0.0047	0.0024~0.0063	0.0047~0.0024	0.0024~0.0063
						NC5330	591(459~689)	0.0024~0.0031	0.0024~0.0031	0.0024~0.0047	0.0031~0.0024	0.0024~0.0047
		Hardened low alloy steel	200~400	PD	PC5300	PC5300	328(164~492)	0.0016~0.0039	0.0024~0.0039	0.0024~0.0055	0.0039~0.0024	0.0024~0.0055
		High alloy steel	260~320	PD	PC5300	PC3500	328(164~525)	0.002~0.0043	0.002~0.0043	0.002~0.0059	0.0043~0.002	0.002~0.0059
		Hardened high alloy steel	300~450	PD	PC5300	PC5300	230(98~394)	0.0016~0.0031	0.0024~0.0031	0.0024~0.0047	0.0031~0.0024	0.0024~0.0047
M	Stainless steel	Stainless steel	135-275	LD	PD5335	PC5335	394(262~459)	0.0016~0.0028	0.0016~0.0028	0.0016~0.0031	0.0028~0.0016	0.0016~0.0031
				PD	PC5300	PC5300	427(328~525)	0.0016~0.0028	0.0016~0.0028	0.0016~0.0031	0.0028~0.0016	0.0016~0.0031
K	Cast iron	Gray cast iron	150~230	PD	PC5300	PC6510	623(492~820)	0.0016~0.0047	0.002~0.0055	0.0039~0.0087	0.0055~0.0039	0.0039~0.0102
		Ductile cast iron	150~230	PD	PC5300	PC6510	427(328~525)	0.0016~0.0028	0.0016~0.0031	0.002~0.0047	0.0031~0.002	0.002~0.0047
S	Heat resisting alloy	Ni-heat resisting alloy	130~400	PD	PC5300	PC5300	164(98~328)	0.0016~0.0039	0.0016~0.0039	0.0016~0.0039	0.0039~0.0016	0.0016~0.0039
		Ti-heat resisting alloy	130~400	PD	PC5335	PC5335	197(131~262)	0.0016~0.0031	0.0016~0.0039	0.0024~0.0055	0.0039~0.0024	0.0024~0.0063
				PD	PC5300	PC5300	197(131~262)	0.0016~0.0031	0.0016~0.0039	0.0024~0.0055	0.0039~0.0024	0.0024~0.0063
		High hardened steel	400~	PD	PC5300	PC5300	131(66~262)	0.0016~0.002	0.0016~0.0024	0.0016~0.0031	0.0024~0.0016	0.0016~0.0031
N	Alloyed aluminum	Alloyed aluminum	30~150	ND	H01	H01	984(820~1312)	0.0020~0.0055	0.0024~0.0063	0.0039~0.0087	0.0063~0.0039	0.0047~0.0098
	Alloyed copper	Alloyed copper	150-160	ND	H01	H01	820(656~984)	0.0020~0.0055	0.0024~0.0063	0.0039~0.0087	0.0063~0.0039	0.0047~0.0098

※ The Max. feed of 5D holders is 70%~80% of the max. conditions of 2D/3D/4D holders.

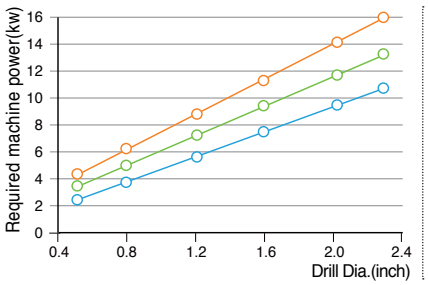
※ In interrupted machining part, reduce 30~50% of feed from the above machining around interrupted part.

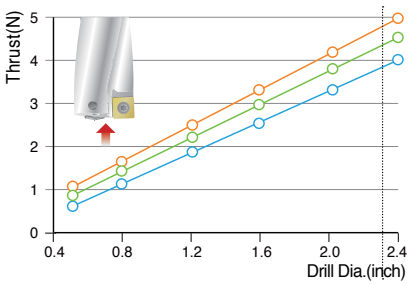
Required machine power

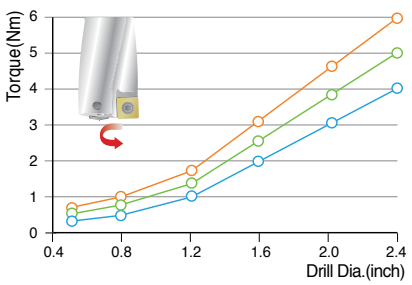
▶ The graphs below show the cutting force required in drilling.
▶ Machining with the KING DRILL and a machine with high rigidity and power.

• Workpiece : AISI4140 • Cutting condition : vc(sfm)=328
• Through coolant system

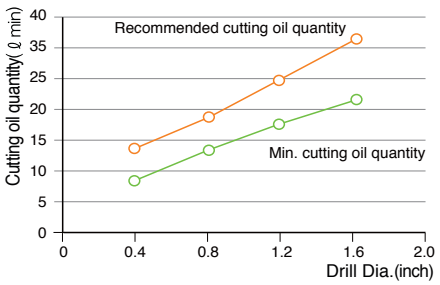
fn(ipr)=0.005 fn(ipr)=0.004 fn(ipr)=0.003







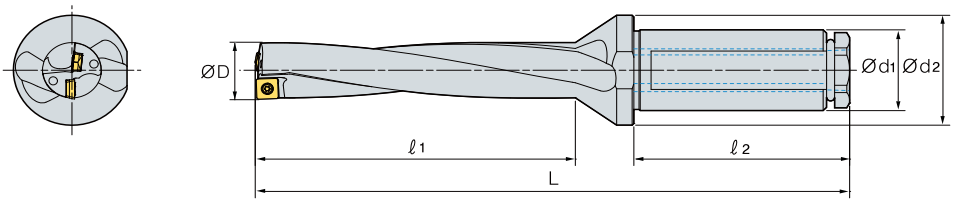
Cutting oil quantity



• **Workpiece** : AISI4140(240HB)
• **Cutting condition** : vc(sfm)=328
• Through coolant system

• The data of the graph above could be changed depending on workpiece and cutting condition.

Drill tolerance and hole tolerance

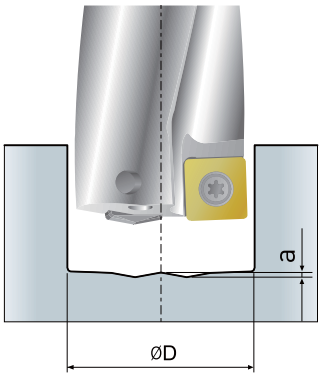


(inch)

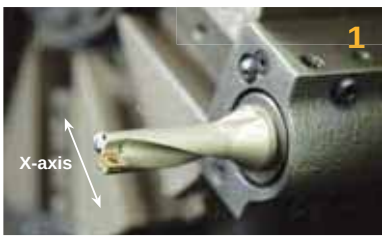
Drill Dia.		Ø0.484 ~Ø1.125	Ø1.187 ~Ø1.750	Ø1.812~ Ø2.375
2D~3D	Drill tolerance(ØD)	~ -0.006	~ -0.006	~ -0.006
	Hole tolerance	-0.016 ~ +0.008	-0.004 ~ +0.010	-0.004 ~ +0.011
4D~5D	Drill tolerance(ØD)	~ -0.006	~ -0.006	~ -0.006
	Hole tolerance	-0.002 ~ +0.010	-0.002 ~ +0.012	-0.002 ~ +0.013

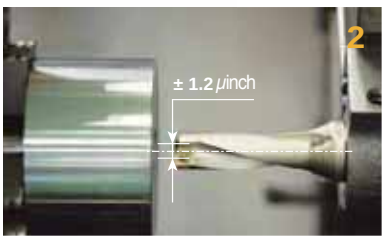
The Shape of the Bottom of Blind Hole

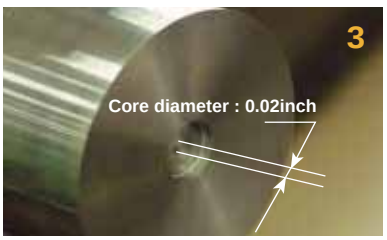
Drill diameter(inch)	Peripheral insert	Central insert	a(inch)
Ø0.484~Ø0.531	SPMT040204-□□	XOMT040204-□□	0.016
Ø0.562~Ø0.625	SPMT050204-□□	XOMT050204-□□	0.016
Ø0.687~Ø0.750	SPMT060205-□□	XOMT060204-□□	0.020
Ø0.812~Ø0.875	SPMT07T208-□□	XOMT07T205-□□	0.020
Ø0.937~Ø1.125	SPMT090308-□□	XOMT090305-□□	0.028
Ø1.187~Ø1.375	SPMT11T308-□□	XOMT11T306-□□	0.031
Ø1.437~Ø1.687	SPMT130410-□□	XOMT130406-□□	0.039
Ø1.750~Ø2.000	SPMT15M510-□□	XOMT15M508-□□	0.043
Ø2.062~Ø2.375	SPMT180510-□□	XOMT180508-□□	0.047



Notice for setting the drill in the lathe







• Set the peripheral insert parallel to the X axis. (based on the side lock)
• If the machined core is 0.024inch after machining 0.2inch, that is the proper setting.
※ Please make sure that the location of the side lock could be different depending on manufacturers of machine.

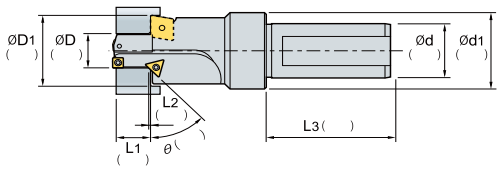
Insert and parts

Drill dia.	Peripheral insert	Central insert	Screw	Wrench	Torque(Nm)
Ø0.484~Ø0.531	SPMT040204-□□	XOMT040204-□□	FTNA0204	TW06P	0.4
Ø0.562~Ø0.625	SPMT050204-□□	XOMT050204-□□	FTNA0204	TW06P	0.4
Ø0.687~Ø0.750	SPMT060205-□□	XOMT060204-□□	FTKA02206S	TW07P	0.8
Ø0.812~Ø0.875	SPMT07T208-□□	XOMT07T205-□□	FTKA02565	TW07S	0.8
Ø0.937~Ø1.125	SPMT090308-□□	XOMT090305-□□	FTKA0307	TW09S	1.2
Ø1.187~Ø1.375	SPMT11T308-□□	XOMT11T306-□□	FTKA03508	TW15S	3
Ø1.437~Ø1.687	SPMT130410-□□	XOMT130406-□□	FTKA0410	TW15S	3
Ø1.750~Ø2.000	SPMT15M510-□□	XOMT15M508-□□	FTNC04511	TW20S	5
Ø2.062~Ø2.375	SPMT180510-□□	XOMT180508-□□	FTNA0511	TW20-100	5

• In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw.
• Please make sure to use a Korloy-produced wrench and screw only.

Special drill order form

☐



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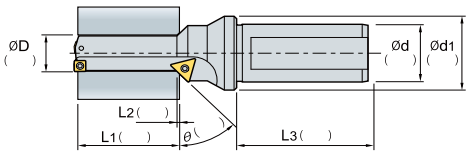

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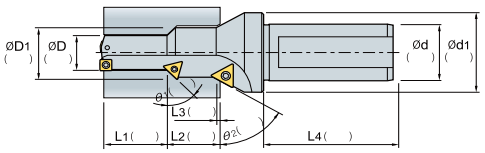

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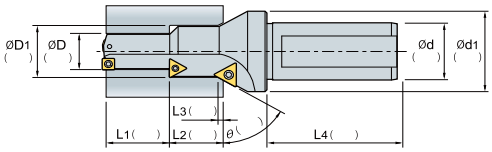

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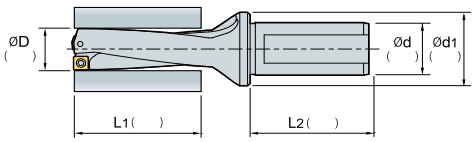


■ Coolant type

☐ Through coolant Plug Type(Standard) ☐ Through coolant Non Plug Type ☐ No coolant

■ Hole type

☐ Blind hole ☐ Thru hole

■ Types of shank

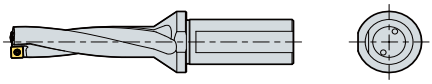
☐  Flat Type

☐  Weldon Type

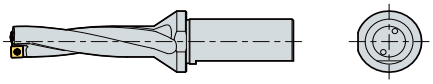
☐  Whistle Notch Type

■ Location of side lock

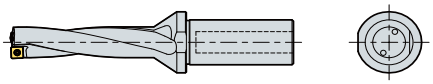
☐ Parallel to peripheral insert(standard)



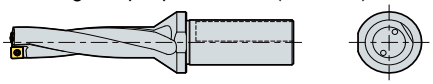
☐ 90°angle to peripheral insert(standard)



☐ 180°angle to peripheral insert(standard)



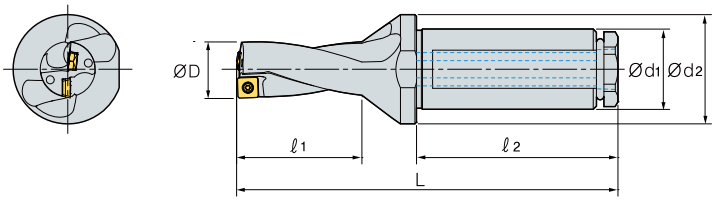
☐ 270° angle to peripheral insert(standard)



■ Note

- Currently using tool :
- Current cutting condition
  - RPM or vc(sfm) :
  - vf(inch/min) or fn(ipr) :
  - depth of cut(inch) :
- Tool life :
- Currently using machine
  - Machining center :
  - General lathe :
  - CNC lathe :

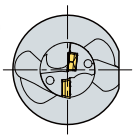
KING DRILL-2D New

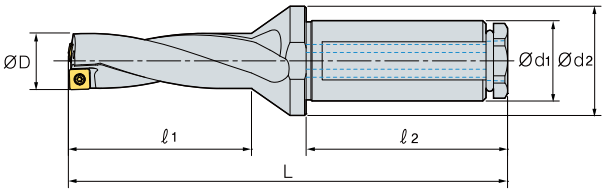


(inch)

Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2DA	0484075HP-04	0.484	31/64	0.75	0.98	1.06	1.97	3.58	SPMT040204-□□ XOMT040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	1.14	1.97	3.66			
	0531075HP-04	0.531	17/32	0.75	0.98	1.14	1.97	3.66			
	0562075HP-05	0.562	9/16	0.75	0.98	1.22	1.97	3.78	SPMT050204-□□ XOMT050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	1.38	1.97	3.98			
	0687100HP-06	0.687	11/16	1.00	1.34	1.46	2.20	4.29	SPMT07T208-□□ XOMT07T205-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	1.61	2.20	4.49			
	0812100HP-07	0.812	13/16	1.00	1.34	1.77	2.20	4.72	SPMT090308-□□ XOMT090305-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	1.85	2.20	4.80			
	0937125HP-09	0.937	15/16	1.25	1.73	2.01	2.36	5.24	SPMT090308-□□ XOMT090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	2.09	2.36	5.31			
	1031125HP-09	1.031	1 1/32	1.25	1.73	2.17	2.36	5.39			
	1062125HP-09	1.062	1 1/16	1.25	1.73	2.24	2.36	5.51			
	1125125HP-09	1.125	1 1/8	1.25	1.73	2.40	2.36	5.71			
	1187125HP-11	1.187	1 3/16	1.25	1.73	2.48	2.36	5.91	SPMT11T308-□□ XOMT11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	2.64	2.36	6.06			
	1312125HP-11	1.312	1 5/16	1.25	1.73	2.72	2.36	6.18			
	1375125HP-11	1.375	1 3/8	1.25	1.73	2.87	2.36	6.34			
	1437150HP-13	1.437	1 7/16	1.50	1.89	2.99	2.76	6.93	SPMT130410-□□ XOMT130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	3.15	2.76	7.13			
	1562150HP-13	1.562	1 9/16	1.50	1.89	3.31	2.76	7.32			
	1625150HP-13	1.625	1 5/8	1.50	1.89	3.39	2.76	7.40			
	1687150HP-13	1.687	1 11/16	1.50	2.28	3.58	2.76	7.72			
	1750150HP-15	1.750	1 3/4	1.50	2.28	3.66	2.76	7.80	SPMT15M510-□□ XOMT15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	3.82	2.76	7.99			
	1875150HP-15	1.875	1 7/8	1.50	2.28	3.98	2.76	8.19			
	1937150HP-15	1.937	1 15/16	1.50	2.28	4.06	2.76	8.27			
	2000150HP-15	2.000	2	1.50	2.68	4.25	2.76	8.58			
	2062150HP-18	2.062	2 1/16	1.50	2.68	4.33	2.76	8.66	SPMT180510-□□ XOMT180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	4.49	2.76	8.82			
	2187150HP-18	2.187	2 3/16	1.50	2.68	4.65	2.76	9.06			
	2250150HP-18	2.250	2 1/4	1.50	2.68	4.76	2.76	9.17			
	2313150HP-18	2.313	2 5/16	1.50	2.68	5.00	2.76	9.41			
	2375150HP-18	2.375	2 3/8	1.50	2.68	5.12	2.76	9.53			

KING DRILL-3D New

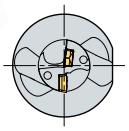


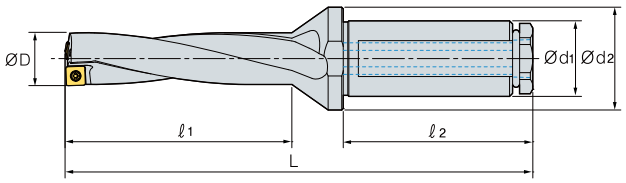


(inch)

Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3DA	0484075HP-04	0.484	31/64	0.75	0.98	1.54	1.97	4.06	SPMT040204-□□ XOMT040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	1.65	1.97	4.17			
	0531075HP-04	0.531	17/32	0.75	0.98	1.65	1.97	4.17			
	0562075HP-05	0.562	9/16	0.75	0.98	1.77	1.97	4.33	SPMT050204-□□ XOMT050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	2.01	1.97	4.61			
	0687100HP-06	0.687	11/16	1.00	1.34	2.13	2.20	4.96	SPMT060205-□□ XOMT060204-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	2.36	2.20	5.24			
	0812100HP-07	0.812	13/16	1.00	1.34	2.60	2.20	5.55	SPMT07T208-□□ XOMT07T205-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	2.72	2.20	5.67			
	0937125HP-09	0.937	15/16	1.25	1.73	2.95	2.36	6.18	SPMT090308-□□ XOMT090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	3.07	2.36	6.30			
	1031125HP-09	1.031	1 1/32	1.25	1.73	3.19	2.36	6.42			
	1062125HP-09	1.062	1 1/16	1.25	1.73	3.31	2.36	6.57			
	1125125HP-09	1.125	1 1/8	1.25	1.73	3.54	2.36	6.85			
	1187125HP-11	1.187	1 3/16	1.25	1.73	3.66	2.36	7.09	SPMT11T308-□□ XOMT11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	3.90	2.36	7.32			
	1312125HP-11	1.312	1 5/16	1.25	1.73	4.02	2.36	7.48			
	1375125HP-11	1.375	1 3/8	1.25	1.73	4.25	2.36	7.72			
	1437150HP-13	1.437	1 7/16	1.50	1.89	4.41	2.76	8.35	SPMT130410-□□ XOMT130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	4.65	2.76	8.62			
	1562150HP-13	1.562	1 9/16	1.50	1.89	4.88	2.76	8.90			
	1625150HP-13	1.625	1 5/8	1.50	1.89	5.00	2.76	9.02			
	1687150HP-13	1.687	1 11/16	1.50	2.28	5.28	2.76	9.41			
	1750150HP-15	1.750	1 3/4	1.50	2.28	5.39	2.76	9.53	SPMT15M510-□□ XOMT15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	5.63	2.76	9.80			
	1875150HP-15	1.875	1 7/8	1.50	2.28	5.87	2.76	10.08			
	1937150HP-15	1.937	1 15/16	1.50	2.28	5.98	2.76	10.20			
	2000150HP-15	2.000	2	1.50	2.68	6.26	2.76	10.59			
	2062150HP-18	2.062	2 1/16	1.50	2.68	6.38	2.76	10.71	SPMT180510-□□ XOMT180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	6.61	2.76	10.94			
	2187150HP-18	2.187	2 3/16	1.50	2.68	6.85	2.76	11.26			
	2250150HP-18	2.250	2 1/4	1.50	2.68	7.01	2.76	11.42			
	2313150HP-18	2.313	2 5/16	1.50	2.68	7.32	2.76	11.73			
	2375150HP-18	2.375	2 3/8	1.50	2.68	7.48	2.76	11.89			

KING DRILL-4D New



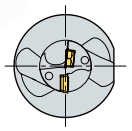


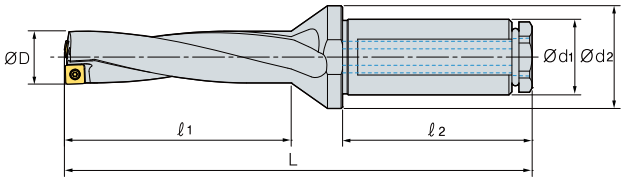
(inch)

Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4DA	0484075HP-04	0.484	31/64	0.75	0.98	2.01	1.97	4.53	SPMT040204-□□ XOMT040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	2.17	1.97	4.69			
	0531075HP-04	0.531	17/32	0.75	0.98	2.17	1.97	4.69			
	0562075HP-05	0.562	9/16	0.75	0.98	2.32	1.97	4.88	SPMT050204-□□ XOMT050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	2.64	1.97	5.24			
	0687100HP-06	0.687	11/16	1.00	1.34	2.80	2.20	5.63	SPMT07T208-□□ XOMT07T205-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	3.11	2.20	5.98			
	0812100HP-07	0.812	13/16	1.00	1.34	3.43	2.20	6.38	SPMT090308-□□ XOMT090305-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	3.58	2.20	6.54			
	0937125HP-09	0.937	15/16	1.25	1.73	3.90	2.36	7.13	SPMT090308-□□ XOMT090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	4.06	2.36	7.28			
	1031125HP-09	1.031	1 1/32	1.25	1.73	4.21	2.36	7.44			
	1062125HP-09	1.062	1 1/16	1.25	1.73	4.37	2.36	7.64			
	1125125HP-09	1.125	1 1/8	1.25	1.73	4.69	2.36	7.99			
	1187125HP-11	1.187	1 3/16	1.25	1.73	4.84	2.36	8.27	SPMT11T308-□□ XOMT11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	5.16	2.36	8.58			
	1312125HP-11	1.312	1 5/16	1.25	1.73	5.31	2.36	8.78			
	1375125HP-11	1.375	1 3/8	1.25	1.73	5.63	2.36	9.09			
	1437150HP-13	1.437	1 7/16	1.50	1.89	5.83	2.76	9.76	SPMT130410-□□ XOMT130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	6.14	2.76	10.12			
	1562150HP-13	1.562	1 9/16	1.50	1.89	6.46	2.76	10.47			
	1625150HP-13	1.625	1 5/8	1.50	1.89	6.61	2.76	10.63			
	1687150HP-13	1.687	1 11/16	1.50	2.28	6.97	2.76	11.10			
	1750150HP-15	1.750	1 3/4	1.50	2.28	7.13	2.76	11.26	SPMT15M510-□□ XOMT15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	7.44	2.76	11.61			
	1875150HP-15	1.875	1 7/8	1.50	2.28	7.76	2.76	11.97			
	1937150HP-15	1.937	1 15/16	1.50	2.28	7.91	2.76	12.13			
	2000150HP-15	2.000	2	1.50	2.68	8.27	2.76	12.60			
	2062150HP-18	2.062	2 1/16	1.50	2.68	8.43	2.76	12.76	SPMT180510-□□ XOMT180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	8.74	2.76	13.07			
	2187150HP-18	2.187	2 3/16	1.50	2.68	9.06	2.76	13.46			
	2250150HP-18	2.250	2 1/4	1.50	2.68	9.25	2.76	13.66			
	2313150HP-18	2.313	2 5/16	1.50	2.68	9.65	2.76	14.06			
	2375150HP-18	2.375	2 3/8	1.50	2.68	9.84	2.76	14.25			

KING DRILL-5D

New





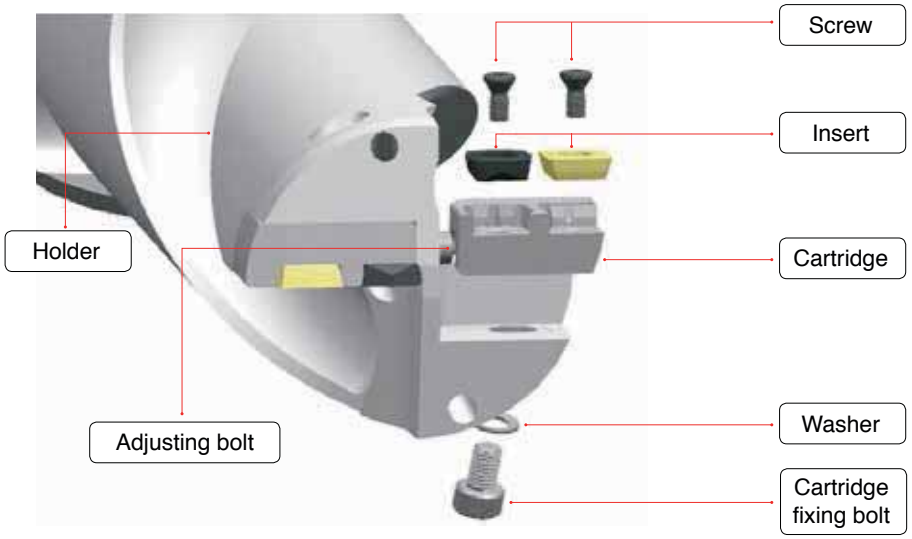
(inch)

Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4DA	0484075HP-04	0.484	31/64	0.75	0.98	2.48	1.97	5.00	SPMT040204-□□ XOMT040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	2.48	1.97	5.00			
	0531075HP-04	0.531	17/32	0.75	0.98	2.68	1.97	5.20			
	0562075HP-05	0.562	9/16	0.75	0.98	2.87	1.97	5.43	SPMT050204-□□ XOMT050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	3.27	1.97	5.87			
	0687100HP-06	0.687	11/16	1.00	1.34	3.46	2.20	6.30	SPMT07T208-□□ XOMT07T205-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	3.86	2.20	6.73			
	0812100HP-07	0.812	13/16	1.00	1.34	4.25	2.20	7.20	SPMT090308-□□ XOMT090305-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	4.45	2.20	7.40			
	0937125HP-09	0.937	15/16	1.25	1.73	4.84	2.36	8.07	SPMT090308-□□ XOMT090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	5.04	2.36	8.27			
	1031125HP-09	1.031	1 1/32	1.25	1.73	5.24	2.36	8.46			
	1062125HP-09	1.062	1 1/16	1.25	1.73	5.43	2.36	8.70			
	1125125HP-09	1.125	1 1/8	1.25	1.73	5.83	2.36	9.13			
	1187125HP-11	1.187	1 3/16	1.25	1.73	6.02	2.36	9.45	SPMT11T308-□□ XOMT11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	6.42	2.36	9.84			
	1312125HP-11	1.312	1 5/16	1.25	1.73	6.61	2.36	10.08			
	1375125HP-11	1.375	1 3/8	1.25	1.73	7.01	2.36	10.47			
	1437150HP-13	1.437	1 7/16	1.50	1.89	7.24	2.76	11.18	SPMT130410-□□ XOMT130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	7.64	2.76	11.61			
	1562150HP-13	1.562	1 9/16	1.50	1.89	8.03	2.76	12.05			
	1625150HP-13	1.625	1 5/8	1.50	1.89	8.23	2.76	12.24			
	1687150HP-13	1.687	1 11/16	1.50	2.28	8.66	2.76	12.80			
	1750150HP-15	1.750	1 3/4	1.50	2.28	8.86	2.76	12.99	SPMT15M510-□□ XOMT15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	9.25	2.76	13.43			
	1875150HP-15	1.875	1 7/8	1.50	2.28	9.65	2.76	13.86			
	1937150HP-15	1.937	1 15/16	1.50	2.28	9.84	2.76	14.06			
	2000150HP-15	2.000	2	1.50	2.68	10.28	2.76	14.61			
	2062150HP-18	2.062	2 1/16	1.50	2.68	10.47	2.76	14.80	SPMT180510-□□ XOMT180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	10.87	2.76	15.20			
	2187150HP-18	2.187	2 3/16	1.50	2.68	11.26	2.76	15.67			
	2250150HP-18	2.250	2 1/4	1.50	2.68	11.50	2.76	15.91			
	2313150HP-18	2.313	2 5/16	1.50	2.68	11.97	2.76	16.38			
	2375150HP-18	2.375	2 3/8	1.50	2.68	12.20	2.76	16.61			

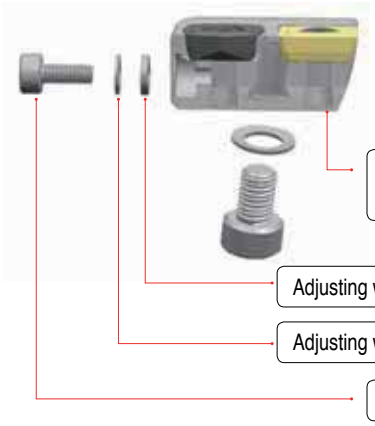
High rigidity drill produces cost efficiency due to cartridge replacement.

KING DRILL (for large diameter drilling) New

- Cartridge type for Ø2.4~Ø3.94 drilling.
- Peripheral cartridge can adjust the drilling diameter within 0.197inch.
- Easy to adjust drilling diameter with adjusting bolt.



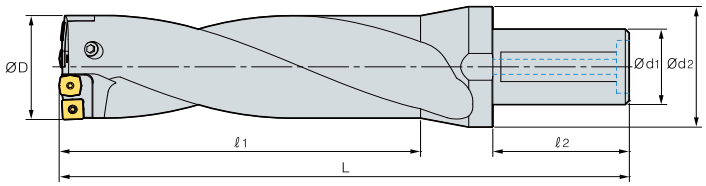
Adjustment of drill diameter



Adjustment Ø(inch)	Adjusting Washer	
	Designation	Width(inch)
1	WA0305	0.020
2	WA0310	0.040
3	WA0305 + WA0310	0.059
4	WA0310 x 2	0.079
5	WA0305 + WA0310 x 2	0.098

※ Adjusting washer adjusts the drilling diameter within 0.197inch.

KING DRILL(for large diameter drilling) New



(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Cartridge		Screw	Wrench
								Internal	External		
K2DA	240256200HP-11	2.40~2.56	2.0	3.15	5.12	3.35	10.24	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	5.51	3.35	10.63	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	5.91	3.35	11.02	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	6.30	3.35	11.42	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	6.69	3.35	11.81	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200HP-15	3.35~3.54	2.0	3.74	7.09	3.35	12.20	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	7.48	3.35	12.60	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	7.87	3.35	12.99	KDC374394C	KDC374394P	FTNA0511	TW20-100
K3DA	240256200HP-11	2.40~2.56	2.0	3.15	7.68	3.35	12.80	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	8.27	3.35	13.39	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	8.86	3.35	13.98	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	9.45	3.35	14.57	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	10.04	3.35	15.16	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200HP-15	3.35~3.54	2.0	3.74	10.63	3.35	15.75	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	11.22	3.35	16.34	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	11.81	3.35	16.93	KDC374394C	KDC374394P	FTNA0511	TW20-100
K4DA	240256200HP-11	2.40~2.56	2.0	3.15	10.24	3.35	15.35	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	11.02	3.35	16.14	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	11.81	3.35	16.93	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	12.60	3.35	17.72	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	13.39	3.35	18.50	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200-HP15	3.35~3.54	2.0	3.74	14.17	3.35	19.29	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	14.96	3.35	20.08	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	15.75	3.35	20.87	KDC374394C	KDC374394P	FTNA0511	TW20-100

Applicable inserts **G06**

Parts

(inch)

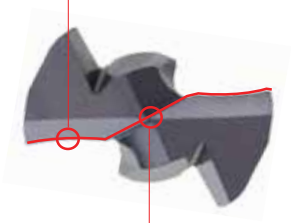
Cartridge		Range (Ø)	Insert				Screw	Wrench
Internal	External		Designation	Quantity	Designation	Quantity		
KDC240256C	KDC240256P	2.40~2.56	XOM(E)T11T306-□□	2	SPM(E)T11T308-□□	2	FTKA03508	TW15S
KDC256276C	KDC256276P	2.56~2.76	XOM(E)T130406-□□	2	SPM(E)T130410-□□	2	FTKA0410	TW15S
KDC276295C	KDC276295P	2.76~2.95	XOM(E)T130406-□□	2	SPM(E)T130410-□□	2	FTKA0410	TW15S
KDC295315C	KDC295315P	2.95~3.15	XOM(E)T130406-□□	2	SPM(E)T130410-□□	2	FTKA0410	TW15S
KDC315335C	KDC315335P	3.15~3.35	XOM(E)T15M508-□□	2	SPM(E)T15M510-□□	2	FTNC04511	TW20S
KDC335354C	KDC335354P	3.35~3.54	XOM(E)T15M508-□□	2	SPM(E)T15M510-□□	2	FTNC04511	TW20S
KDC354374C	KDC354374P	3.54~3.74	XOM(E)T15M508-□□	2	SPM(E)T15M510-□□	2	FTNC04511	TW20S
KDC374394C	KDC374394P	3.74~3.94	XOM(E)T180508-□□	2	SPM(E)T180510-□□	2	FTNA0511	TW20-100

Cone Shaped Head Indexable Drill

TPDC New

- Clamping design
  - One step clamp system → Increased stability
  - Clamping system allowing to change inserts while the holder is attached on the machine → Shortened setting time
- Optimized blade design
  - Excellent chip control → Possibility to use for various types of workpieces
- Helical shaped coolant hole system
  - Wide chip pocket area secured → Better lubrication + chip flow improved
- Material technology
  - Ultra fine substrate + Multi layer coating applied → Excellent anti chipping & wear resistance

Optimal blade design
• Improved chip control and wear resistance



Overlap thinning
• Excellent centering and penetration

Surface treatment
• Good durability

Flute polishing
• Better chip flow

High helix angle
• Low cutting load and good machinability

Helical shaped coolant hole system
• Chip flow improved

Code system of holder

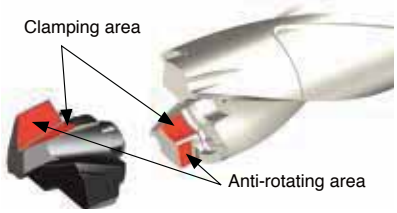
TPD	C	A	5D	–	0591	075	–	2953
Top solid Piercing Drill	Insert type: C : Cone type	A : Inch type No code : Metric type	Aspect ratio(L/D): 3D, 5D, 8D		Drill dia.: 0591 : Ø0.591inch	Shank dia.: 075 : Ø0.75inch		Flute length(inch): 2953 : 2.953

Code system of insert

TPD	0591	–	C	A	P
Top solid Piercing Drill	Drill dia.: 0591 : Ø0.591”		Insert type: C : Cone type	A : Inch type No code : Metric type	Machining area: P : Steel, Universal M : Stainless steel K : Cast iron N : Aluminium C : Carbon fiber Reinforced plastic

Features of Clamping System

▶ One Step Clamp System Easy and quick tool change with good repeatability



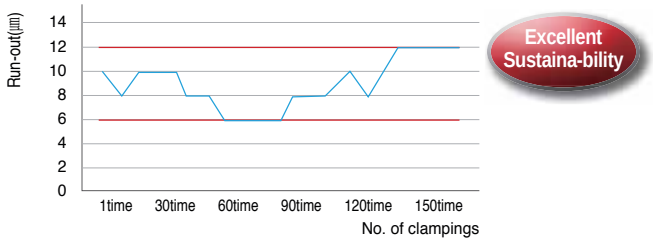
- **Clamping area** : Easy and fast tool change
- **Anti-rotating area** : Performs as a stopper
- Clamping and anti-rotating area make an acute angle to prevent insert rotation while machining

Durability test

- **Workpiece** : Alloy steel (AISI4140, HRC22)
- **Cutting condition** : Drill dia.(inch) = Ø0.591
  vc(sfm) = 259.3
  fn(ipr) = 0.01, ap(inch) = 2.362
  wet
- **Tools :** **Insert** TPD0591CAP
  Holder TPDCA5D-0591075-2953

After using 40 inserts, the setting run-out remains below 15㎛

Sustainability test

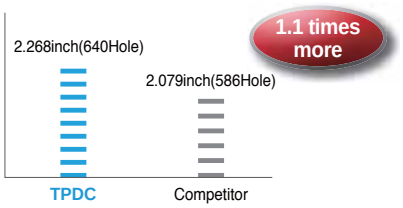


After clamping 150 times, the drill run-out remains

Cutting Performance

Part of machine

- **Workpiece** : Alloy steel (AISI4140, HRC22)
- **Cutting condition** : Drill dia.(inch) = Ø0.748
  vc(sfm) = 328.1
  fn(ipr) = 0.012
  ap(inch) = 3.543
  wet
- **Tools :** **Insert** TPD0758CAP (PC5335)
  Holder TPDCA5D-0748100-3740



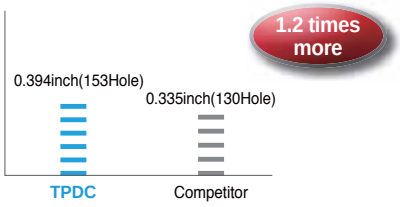
鰯 Lubricative multi layer coating prevents chipping on cutting edges.

TPDC

Competitor

Part of machine

- **Workpiece** : Carbon steel (AISI1045, HRC40)
- **Cutting condition** : Drill dia.(inch) = Ø0.709
  vc(sfm) = 196.9
  fn(ipr) = 0.006
  ap(inch) = 2.559
  wet
- **Tools :** **Insert** TPD0709CAP (PC5335)
  Holder TPDCA5D-0709100-3543



鰯 Lubricative multi layer coating enhances wear resistance.

Recommended Cutting Condition

Workpiece			HB	Grade	vc	Depth of cut = 3D, 5D Feed rate (ipr) per drill dia.(inch)	
ISO		Workpiece			sfm	Ø0.472~Ø0.629	Ø0.630~Ø0.786
P	Carbon steel	Low carbon steel	80~120	PC5335	360(262-459)	0.0060-0.0118	0.0079-0.0138
		High carbon steel	180~280	PC5335	328(230-426)	0.0060-0.0118	0.0079-0.0138
	Alloy steel	Low alloy steel	140~260	PC5335	360(262-459)	0.0070-0.0138	0.0090-0.0150
		Low pre-hardened steel	200~400	PC5335	246(164-328)	0.0070-0.0138	0.0090-0.0150
		High alloy steel	260~320	PC5335	230(164-295)	0.0070-0.0138	0.0079-0.0138
		High pre-hardened steel	300~450	PC5335	197(131-262)	0.0070-0.0138	0.0079-0.0138

• In case of 8D, reduce the cutting condition 40~50% lower than above after machining the beginning of hole(1.5D).
• In case of interrupted machining, reduce the feed to 0.1~0.15 arround the interrupted part.

How to Make Good Insert Clamping

① Clean the mounting seat with air or cloth.

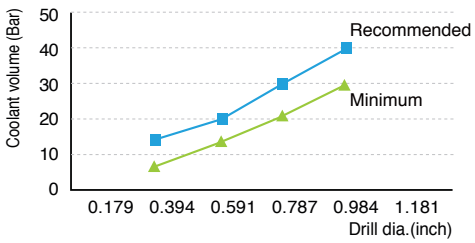
② Put an insert on the holder.

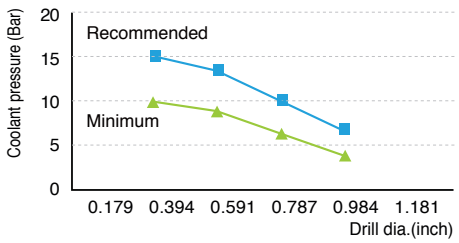
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert.
Turn the wrench clockwise to finish clamping.

Clamped state

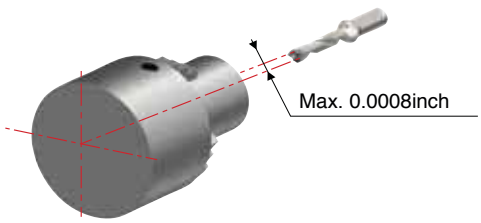
Coolant Tip

■ **Workpiece** : Alloy steel (AISI4140,HRC22)
■ **Cutting condition** : vc(sfm) = 328, wet

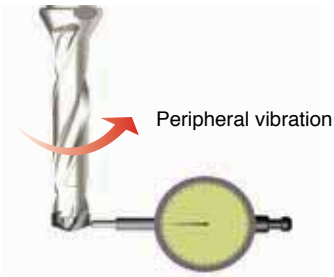




Precautions When Setting

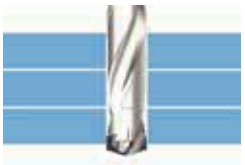


Setting of the horizontal equipment

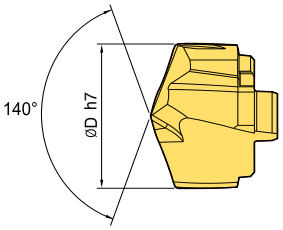


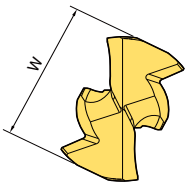
Setting of the vertical equipment

Precautions When Drilling

Ramping	Machining verlapped panels	Plunging	Boring
			
1. A slope inclined more than 6° is not allowed. 2. When entering, reduce the feed to 30~50%.	1. Space between panels affects chip evacuation problem. 2. Do not make space between panels.	Not allowed	Not allowed

TPDC Insert New





(inch)

Designation		Drill dia. (ØD)	W	Grade	Holder	Wrench
TPD	0472CAP	0.472~0.491	0.448	PC5335	TPDCA(3,5,8)D-0472063-(1417,2362,3780)	TPDC-W12
	0492CAP	0.492~0.511		PC5335	TPDCA(3,5,8)D-0492063-(1496,2480,3937)	
	0512CAP	0.512~0.531	0.484	PC5335	TPDCA(3,5,8)D-0512063-(1535,2559,4094)	TPDC-W13
	0532CAP	0.532~0.550		PC5335	TPDCA(3,5,8)D-0532063-(1614,2677,4252)	
	0551CAP	0.551~0.570	0.528	PC5335	TPDCA(3,5,8)D-0551063-(1654,2756,4409)	TPDC-W14
	0571CAP	0.571~0.590		PC5335	TPDCA(3,5,8)D-0571063-(1732,2874,4567)	
	0591CAP	0.591~0.629	0.563	PC5335	TPDCA(3,5,8)D-0591075-(1772,2953,4724)	TPDC-W15
	0630CAP	0.630~0.668	0.602	PC5335	TPDCA(3,5,8)D-0630075-(1890,3150,5039)	TPDC-W16
	0669CAP	0.669~0.708	0.642	PC5335	TPDCA(3,5,8)D-0669075-(2008,3346,5354)	TPDC-W17
	0709CAP	0.709~0.747	0.681	PC5335	TPDCA(3,5,8)D-0709100-(2126,3543,5669)	TPDC-W18
	0748CAP	0.748~0.786	0.721	PC5335	TPDCA(3,5,8)D-0748100-(2244,3740,5984)	TPDC-W19

※ Order made items available

Recommended Torque per Wrench

(inch)

Designation	Drill dia.(ØD)	Torque(in.lbf)
TPDC-W12	0.472~0.511	22.1
TPDC-W13	0.512~0.550	22.1
TPDC-W14	0.551~0.590	22.1
TPDC-W15	0.591~0.629	22.1
TPDC-W16	0.630~0.668	22.1
TPDC-W17	0.669~0.708	31.0
TPDC-W18	0.709~0.747	31.0
TPDC-W19	0.748~0.786	31.0

TPDC3D/5D/8D New

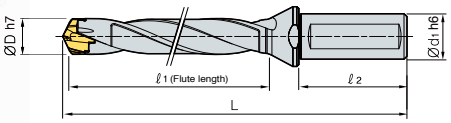


Fig.1

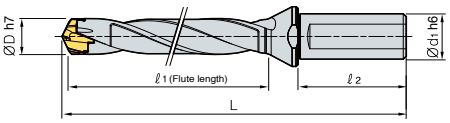


Fig.2

(inch)

	Designation	ØD	Ød	Ød1	ℓ_1	ℓ_2	L	Insert	Fig.
TPDCA	3D-0472063-1417	0.472~0.491	0.625	0.787	1.417	1.890	3.898	TPD0472CA ▫ -0491CA ▫	1
	3D-0492063-1496	0.492~0.511	0.625	0.787	1.496	1.890	3.976	TPD0492CA ▫ -0511CA ▫	1
	3D-0512063-1535	0.512~0.531	0.625	0.787	1.535	1.890	4.055	TPD0512CA ▫ -0531CA ▫	1
	3D-0532063-1614	0.532~0.550	0.625	0.787	1.614	1.890	4.134	TPD0532CA ▫ -0550CA ▫	1
	3D-0551063-1654	0.551~0.570	0.625	0.787	1.654	1.890	4.173	TPD0551CA ▫ -0570CA ▫	1
	3D-0571063-1732	0.571~0.590	0.625	0.787	1.732	1.890	4.213	TPD0571CA ▫ -0590CA ▫	1
	3D-0591075-1772	0.591~0.629	0.750	0.984	1.772	1.969	4.449	TPD0591CA ▫ -0629CA ▫	2
	3D-0630075-1890	0.630~0.668	0.750	0.984	1.890	1.969	4.606	TPD0630CA ▫ -0668CA ▫	2
	3D-0669075-2008	0.669~0.708	0.750	0.984	2.008	1.969	4.724	TPD0669CA ▫ -0708CA ▫	2
	3D-0709100-2126	0.709~0.747	1.000	1.299	2.126	2.205	5.197	TPD0709CA ▫ -0747CA ▫	2
	3D-0748100-2244	0.748~0.786	1.000	1.299	2.244	2.205	5.315	TPD0748CA ▫ -0786CA ▫	2
	5D-0472063-2362	0.472~0.491	0.625	0.787	2.362	1.890	4.843	TPD0472CA ▫ -0491CA ▫	1
	5D-0492063-2480	0.492~0.511	0.625	0.787	2.480	1.890	4.961	TPD0492CA ▫ -0511CA ▫	1
	5D-0512063-2559	0.512~0.531	0.625	0.787	2.559	1.890	5.079	TPD0512CA ▫ -0531CA ▫	1
	5D-0532063-2677	0.532~0.550	0.625	0.787	2.677	1.890	5.197	TPD0532CA ▫ -0550CA ▫	1
	5D-0551063-2756	0.551~0.570	0.625	0.787	2.756	1.890	5.276	TPD0551CA ▫ -0570CA ▫	1
	5D-0571063-2874	0.571~0.590	0.625	0.787	2.874	1.890	5.354	TPD0571CA ▫ -0590CA ▫	1
	5D-0591075-2953	0.591~0.629	0.750	0.984	2.953	1.969	5.630	TPD0591CA ▫ -0629CA ▫	2
	5D-0630075-3150	0.630~0.668	0.750	0.984	3.150	1.969	5.866	TPD0630CA ▫ -0668CA ▫	2
	5D-0669075-3346	0.669~0.708	0.750	0.984	3.346	1.969	6.063	TPD0669CA ▫ -0708CA ▫	2
	5D-0709100-3543	0.709~0.747	1.000	1.299	3.543	2.205	6.614	TPD0709CA ▫ -0747CA ▫	2
	5D-0748100-3740	0.748~0.786	1.000	1.299	3.740	2.205	6.811	TPD0748CA ▫ -0786CA ▫	2
	8D-0472063-3780	0.472~0.491	0.625	0.787	3.780	1.890	6.260	TPD0472CA ▫ -0491CA ▫	1
	8D-0492063-3937	0.492~0.511	0.625	0.787	3.937	1.890	6.417	TPD0492CA ▫ -0511CA ▫	1
	8D-0512063-4094	0.512~0.531	0.625	0.787	4.094	1.890	6.614	TPD0512CA ▫ -0531CA ▫	1
	8D-0532063-4252	0.532~0.550	0.625	0.787	4.252	1.890	6.811	TPD0532CA ▫ -0550CA ▫	1
	8D-0551063-4409	0.551~0.570	0.625	0.787	4.409	1.890	6.929	TPD0551CA ▫ -0570CA ▫	1
	8D-0571063-4567	0.571~0.590	0.625	0.787	4.567	1.890	7.087	TPD0571CA ▫ -0590CA ▫	1
	8D-0591075-4724	0.591~0.629	0.750	0.984	4.724	1.969	7.402	TPD0591CA ▫ -0629CA ▫	2
	8D-0630075-5039	0.630~0.668	0.750	0.984	5.039	1.969	7.756	TPD0630CA ▫ -0668CA ▫	2
	8D-0669075-5354	0.669~0.708	0.750	0.984	5.354	1.969	8.071	TPD0669CA ▫ -0708CA ▫	2
	8D-0709100-5669	0.709~0.747	1.000	1.299	5.669	2.205	8.740	TPD0709CA ▫ -0747CA ▫	2
	8D-0748100-5984	0.748~0.786	1.000	1.299	5.984	2.205	9.055	TPD0748CA ▫ -0786CA ▫	2

※ The shank is based on DIN6535 and ISO9677.

High precision grinding and superior clamping precision with auto-centering system

TPDB New

- High precision clamping system - High precision grinding and superior clamping precision with auto-centering system.
- Screw on clamping system - Easy clamping system of TPDB insert.
- Sharp cutting edge - Improved chip evacuation, low cutting load, longer tool life with ultra-fine substrate and exclusive coating layer.
- Holder with excellent durability - Holder with high rigidity and superb wear resistance due to special surface treatment.

Code system of holder

TPD B A 0610 – 075 □ – 5

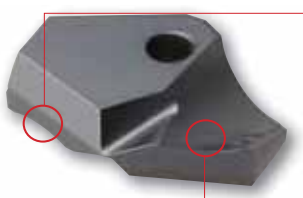
Top Solid Piercing Drill	Insert type	type	Drill dia.	Shank dia.	Shank shape	Aspect ratio
	B : Blade type	A : Inch type No code : Metric type	0610 : Ø0.610	075 : Ø0.75		3D, 5D, 8D

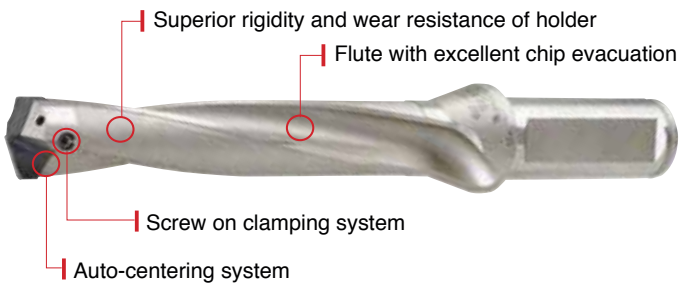
Code system of Insert

TPD 0630 B A

Top Solid Piercing Drill	Drill dia.	Insert type	type
	0630 : Ø0.630	B : Blade type	A : Inch type No code : Metric type

Features

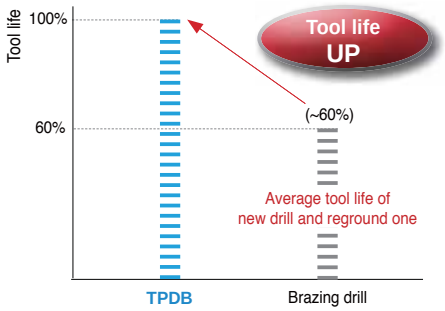




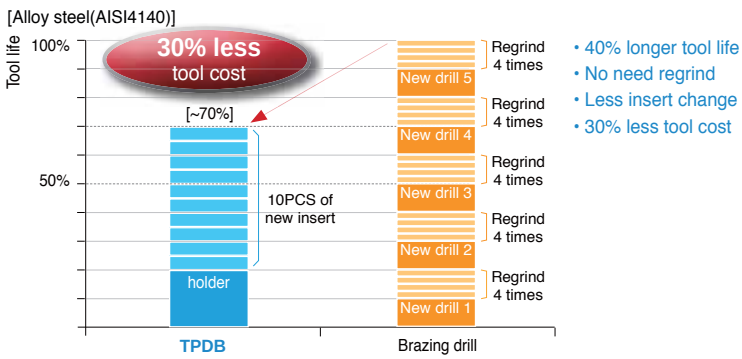
Tool Cost

Comparison of 1 insert tool life

- Exclusive coating and substrate
- Usable till the end of wear (no need regrinding)



Comparison of tool cost when machining 1000PCS of workpiece

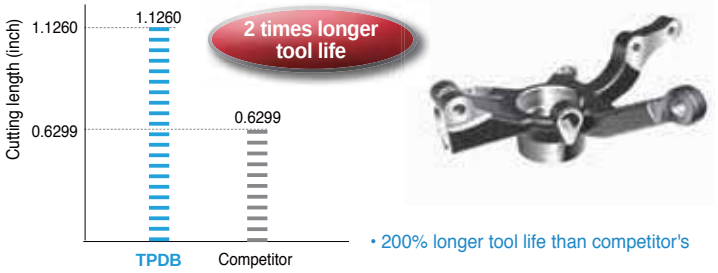


- 40% longer tool life
- No need regrind
- Less insert change
- 30% less tool cost

Application example

Part of automobile

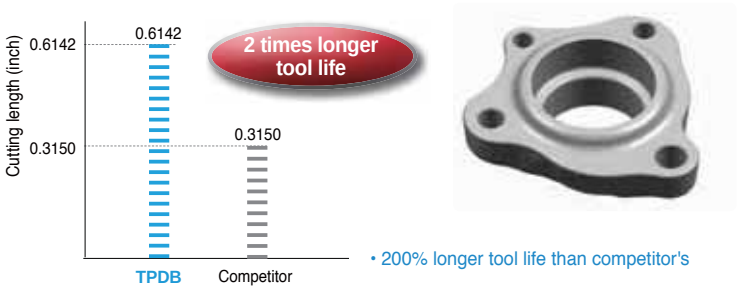
■ **Workpiece** : AISI80-55-06
■ **Cutting condition** : vc(sfm)=324.8
fn(ipr)=0.0122
ap(inch)=1.575
Inner coolant system
■ **Tools : Insert** TPD0768BA(PC5300)
Holder TPDBA0768-100-5
■ **Machine** : MCT (vertical)



• 200% longer tool life than competitor's

Part of heavy equipment

■ **Workpiece** : Hot Forged Steel
■ **Cutting condition** : vc(sfm)=281.8
fn(ipr)=0.0079
ap(inch)=0.787
Inner coolant system
■ **Tools : Insert** TPD0827BA(PC5300)
Holder TPDBA0827-100-3
■ **Machine** : MCT (vertical)



• 200% longer tool life than competitor's

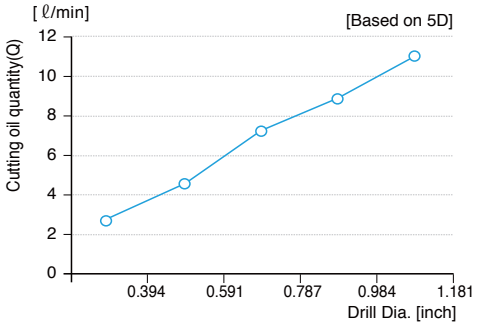
Recommended Cutting Condition

Workpiece				Grade	vc	Depth of cut = 3D~5D Feed(ipr) per drill Dia.(inch)		
ISO		Workpiece	HB		sfm	0.3937~0.6260	0.6300~0.9803	0.9843~1.1772
P	Carbon steel	Low carbon steel	80~120	PC5300, PC5335	365(265 - 464)	0.0059~0.0118	0.0079~0.0138	0.0098~0.0157
		High carbon steel	180~280	PC5300, PC5335	332(232 - 431)	0.0059~0.0118	0.0079~0.0138	0.0098~0.0157
	Alloy steel	Low alloy steel	140~260	PC5300	365(265 - 464)	0.0071~0.0138	0.0091~0.015	0.0110~0.0169
		Low pre-hardened steel	200~400	PC5300	249(166 - 332)	0.0071~0.0138	0.0091~0.015	0.0110~0.0169
		High alloy steel	260~320	PC5300	232(166 - 298)	0.0071~0.0118	0.0079~0.0138	0.0098~0.0157
		High pre-hardened steel	300~450	PC5300	199(133 - 265)	0.0071~0.0118	0.0079~0.0138	0.0098~0.0157
M	Stainless Steel	Austenite series	135~275	PC5300	166(99-232)	0.0051~0.0098	0.0059~0.0118	0.0067~0.0130
		Ferrite series Martensite series	13~275	PC5300	182(133-232)	0.0051~0.0098	0.0059~0.0118	0.0067~0.0130
K	Cast Iron	Gray cast iron	150~230	PC5300	365(265 - 464)	0.0071~0.0138	0.0079~0.0157	0.0098~0.0177
		Ductile cast iron	160~260	PC5300	332(232 - 431)	0.0071~00.0138	0.0079~0.0157	0.0098~0.0177
S	Heat Resisting Steel	Ni-heat resisting alloy	130~400	PC5300	133(66 - 199)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098
		Ti-heat resisting alloy	130~400	PC5300	133(66 - 199)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098
		High hardened steel	400~	PC5300	116(66 - 166)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098

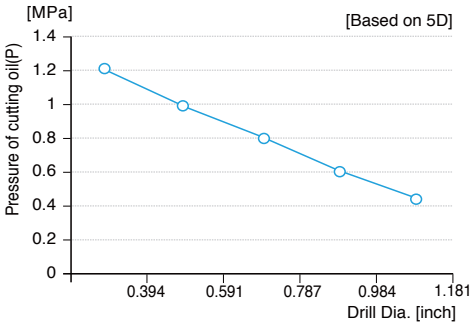
• In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
• In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part.

Technical information

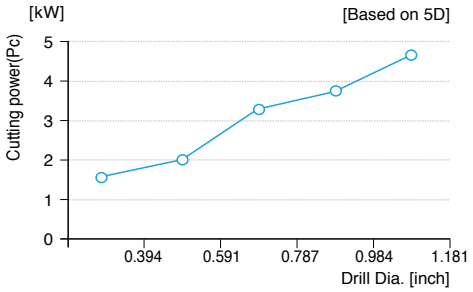
Cutting oil quantity



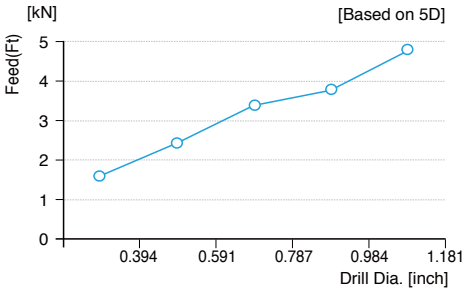
Pressure of cutting oil



Cutting power



Feed



How to clamp a TPDB insert

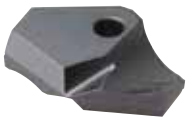
Clamping an insert on a holder

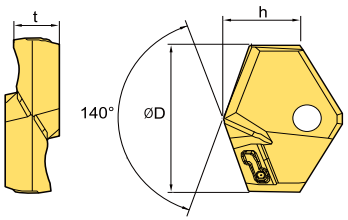
- Put an insert in the holder.
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder.
- Screw the insert.

Changing an insert on the machine

- Separate the insert from the holder.
- As the Fig.2, clean the insert seat
- Place the insert to the mounting seat.
- As the Fig.3, clamp the insert while pushing it to the V shaped groove of the holder.

TPDB Insert New





(inch)

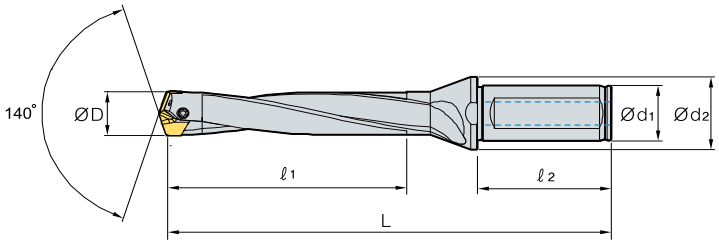
Designation		Grade	ØD	h	t
TPD	0394 ~ 0432BA	PC5300	0.394 ~ 0.432	0.217	0.138
	0433 ~ 0471BA	PC5300	0.433 ~ 0.471	0.228	0.138
	0472 ~ 0511BA	PC5300	0.472 ~ 0.511	0.248	0.138
	0512 ~ 0550BA	PC5300	0.512 ~ 0.550	0.256	0.157
	0551 ~ 0590BA	PC5300	0.551 ~ 0.590	0.268	0.157
	0591 ~ 0629BA	PC5300	0.591 ~ 0.629	0.276	0.157
	0630 ~ 0668BA	PC5300	0.630 ~ 0.668	0.303	0.217
	0669 ~ 0708BA	PC5300	0.669 ~ 0.708	0.311	0.217
	0709 ~ 0747BA	PC5300	0.709 ~ 0.747	0.319	0.236
	0748 ~ 0786BA	PC5300	0.748 ~ 0.786	0.327	0.236
	0787 ~ 0826BA	PC5300	0.787 ~ 0.826	0.382	0.256
	0827 ~ 0865BA	PC5300	0.827 ~ 0.865	0.370	0.256
	0866 ~ 0905BA	PC5300	0.866 ~ 0.905	0.378	0.276
	0906 ~ 0944BA	PC5300	0.906 ~ 0.944	0.386	0.276
	0945 ~ 0983BA	PC5300	0.945 ~ 0.983	0.421	0.295
	0984 ~ 1023BA	PC5300	0.984 ~ 1.023	0.429	0.295
	1024 ~ 1062BA	PC5300	1.024 ~ 1.062	0.433	0.335
	1063 ~ 1101BA	PC5300	1.063 ~ 1.101	0.465	0.335
	1102 ~ 1141BA	PC5300	1.102 ~ 1.141	0.496	0.374
	1142 ~ 1180BA	PC5300	1.142 ~ 1.180	0.508	0.374
	1181 ~ 1219BA	PC5300	1.181 ~ 1.219	0.514	0.394
	1220 ~ 1259BA	PC5300	1.220 ~ 1.259	0.523	0.394
	1260 ~ 1298BA	PC5300	1.260 ~ 1.298	0.531	0.394

Parts

(inch)

Designation		Drill Dia.	Screw	Wrench	Torque (NM)
TPD	0394BA~0508BA	0.394 ~ 0.508	FTNB0209	TW06P	0.4
	0513BA~0587BA	0.513 ~ 0.587	FTNB02512	TW07S	0.8
	0591BA~0705BA	0.591~ 0.705	FTNB02514	TW07S	0.8
	0709BA~0783BA	0.709 ~ 0.783	FTNB0316	TW09S	1.2
	0787BA~0941BA	0.787 ~ 0.941	FTNB0319	TW09S	1.2
	0945BA~1018BA	0.945~ 1.018	FTNB03522	TW15S	3
	1024BA~1098BA	1.024 ~ 1.098	FTNB03524	TW15S	3
	1102BA~1177BA	1.102 ~ 1.177	FTNB0426	TW15S	3
	1181BA~1298BA	1.181 ~ 1.298	FTNB0528	TW20-100	4

TPDB-3D New

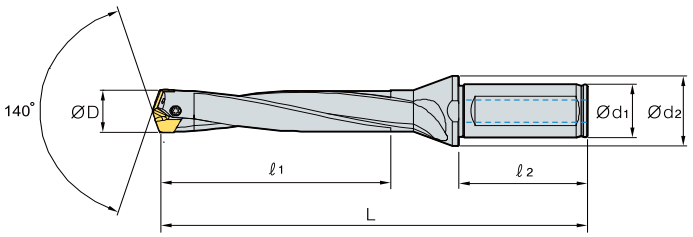


(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-3	0.394~0.412	0.625	0.787	1.181	1.890	3.740	TPD0394BA–0412BA
	0413-063-3	0.413~0.432	0.625	0.787	1.240	1.890	3.780	TPD0413BA–0432BA
	0433-063-3	0.433~0.452	0.625	0.787	1.299	1.890	3.858	TPD0433BA–0452BA
	0453-063-3	0.453~0.471	0.625	0.787	1.358	1.890	3.898	TPD0453BA–0471BA
	0472-063-3	0.472~0.491	0.625	0.787	1.417	1.890	4.016	TPD0472BA-0491BA
	0492-063-3	0.492~0.511	0.625	0.787	1.476	1.890	4.094	TPD0492BA-0511BA
	0512-063-3	0.512~0.530	0.625	0.787	1.535	1.890	4.213	TPD0512BA-0530BA
	0531-063-3	0.531~0.550	0.625	0.787	1.594	1.890	4.291	TPD0531BA-0550BA
	0551-063-3	0.551~0.570	0.625	0.787	1.654	1.890	4.370	TPD0551BA-0570BA
	0571-063-3	0.571~0.590	0.625	0.787	1.713	1.890	4.488	TPD0571BA-0590BA
	0591-075-3	0.591~0.609	0.750	0.984	1.772	1.969	4.646	TPD0591BA-0609BA
	0610-075-3	0.610~0.629	0.750	0.984	1.831	1.969	4.724	TPD0610BA-0629BA
	0630-075-3	0.630~0.649	0.750	0.984	1.890	1.969	4.803	TPD0630BA-0649BA
	0650-075-3	0.650~0.668	0.750	0.984	1.949	1.969	4.882	TPD0650BA-0668BA
	0669-075-3	0.669~0.688	0.750	0.984	2.008	1.969	5.000	TPD0669BA-0688BA
	0689-075-3	0.689~0.708	0.750	0.984	2.067	1.969	5.079	TPD0689BA-0708BA
	0709-100-3	0.709~0.727	1.000	1.299	2.126	2.205	5.394	TPD0709BA-0727BA
	0728-100-3	0.728~0.747	1.000	1.299	2.185	2.205	5.472	TPD0728BA-0747BA
	0748-100-3	0.748~0.767	1.000	1.299	2.244	2.205	5.591	TPD0748BA-0767BA
	0768-100-3	0.768~0.786	1.000	1.299	2.303	2.205	5.669	TPD0768BA-0786BA
	0787-100-3	0.787~0.806	1.000	1.299	2.362	2.205	5.748	TPD0787BA-0806BA
	0807-100-3	0.807~0.826	1.000	1.299	2.421	2.205	5.827	TPD0807BA-0826BA
	0827-100-3	0.827~0.845	1.000	1.299	2.480	2.362	5.945	TPD0827BA-0845BA
	0846-100-3	0.846~0.865	1.000	1.299	2.539	2.362	6.024	TPD0846BA-0865BA
	0866-100-3	0.866~0.885	1.000	1.299	2.598	2.362	6.102	TPD0866BA-0885BA
	0886-100-3	0.886~0.905	1.000	1.299	2.657	2.362	6.181	TPD0886BA-0905BA
	0906-100-3	0.906~0.924	1.000	1.299	2.717	2.362	6.299	TPD0906BA-0924BA
	0925-100-3	0.925~0.944	1.000	1.299	2.776	2.362	6.378	TPD0925BA-0944BA
	0945-125-3	0.945~0.964	1.250	1.693	2.835	2.362	6.614	TPD0945BA-0964BA
	0965-125-3	0.965~0.983	1.250	1.693	2.894	2.362	6.693	TPD0965BA-0983BA
	0984-125-3	0.984~1.003	1.250	1.693	2.953	2.362	6.811	TPD0984BA-1003BA
	1004-125-3	1.004~1.023	1.250	1.693	3.012	2.362	6.890	TPD1004BA-1023BA
	1024-125-3	1.024~1.062	1.250	1.693	3.071	2.362	6.969	TPD1024BA-1062BA
	1063-125-3	1.063~1.101	1.250	1.693	3.189	2.362	7.165	TPD1063BA-1101BA
	1102-125-3	1.102~1.141	1.250	1.693	3.307	2.362	7.323	TPD1102BA-1141BA
	1142-125-3	1.142~1.180	1.250	1.693	3.425	2.362	7.520	TPD1142BA-1180BA
	1181-125-3	1.181~1.219	1.250	1.693	3.543	2.362	7.638	TPD1181BA-1219BA
	1220-125-3	1.220~1.259	1.250	1.693	3.661	2.362	7.835	TPD1220BA-1259BA
	1260-125-3	1.260~1.298	1.250	1.693	3.780	2.362	7.913	TPD1260BA-1299BA

Applicable inserts **G36**

TPDB-5D

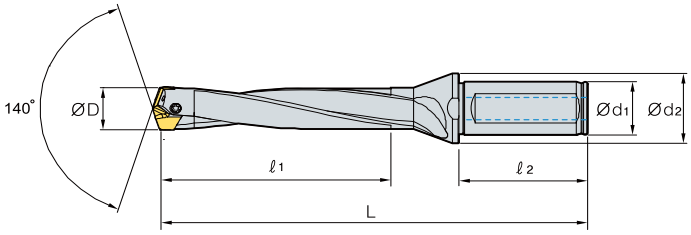


(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-5	0.394~0.412	0.625	0.787	1.969	1.890	4.528	TPD0394BA–0412BA
	0413-063-5	0.413~0.432	0.625	0.787	2.067	1.890	4.606	TPD0413BA–0432BA
	0433-063-5	0.433~0.452	0.625	0.787	2.165	1.890	4.724	TPD0433BA–0452BA
	0453-063-5	0.453~0.471	0.625	0.787	2.264	1.890	4.843	TPD0453BA–0471BA
	0472-063-5	0.472~0.491	0.625	0.787	2.362	1.890	4.961	TPD0472BA-0491BA
	0492-063-5	0.492~0.511	0.625	0.787	2.461	1.890	5.079	TPD0492BA-0511BA
	0512-063-5	0.512~0.530	0.625	0.787	2.559	1.890	5.236	TPD0512BA-0530BA
	0531-063-5	0.531~0.550	0.625	0.787	2.657	1.890	5.354	TPD0531BA-0550BA
	0551-063-5	0.551~0.570	0.625	0.787	2.756	1.890	5.472	TPD0551BA-0570BA
	0571-063-5	0.571~0.590	0.625	0.787	2.854	1.890	5.630	TPD0571BA-0590BA
	0591-075-5	0.591~0.609	0.750	0.984	2.953	1.969	5.827	TPD0591BA-0609BA
	0610-075-5	0.610~0.629	0.750	0.984	3.051	1.969	5.945	TPD0610BA-0629BA
	0630-075-5	0.630~0.649	0.750	0.984	3.150	1.969	6.063	TPD0630BA-0649BA
	0650-075-5	0.650~0.668	0.750	0.984	3.248	1.969	6.181	TPD0650BA-0668BA
	0669-075-5	0.669~0.688	0.750	0.984	3.346	1.969	6.339	TPD0669BA-0688BA
	0689-075-5	0.689~0.708	0.750	0.984	3.445	1.969	6.457	TPD0689BA-0708BA
	0709-100-5	0.709~0.727	1.000	1.299	3.543	2.205	6.811	TPD0709BA-0727BA
	0728-100-5	0.728~0.747	1.000	1.299	3.642	2.205	6.929	TPD0728BA-0747BA
	0748-100-5	0.748~0.767	1.000	1.299	3.740	2.205	7.087	TPD0748BA-0767BA
	0768-100-5	0.768~0.786	1.000	1.299	3.839	2.205	7.205	TPD0768BA-0786BA
	0787-100-5	0.787~0.806	1.000	1.299	3.937	2.205	7.323	TPD0787BA-0806BA
	0807-100-5	0.807~0.826	1.000	1.299	4.035	2.205	7.441	TPD0807BA-0826BA
	0827-100-5	0.827~0.845	1.000	1.299	4.134	2.362	7.598	TPD0827BA-0845BA
	0846-100-5	0.846~0.865	1.000	1.299	4.232	2.362	7.717	TPD0846BA-0865BA
	0866-100-5	0.866~0.885	1.000	1.299	4.331	2.362	7.835	TPD0866BA-0885BA
	0886-100-5	0.886~0.905	1.000	1.299	4.429	2.362	7.953	TPD0886BA-0905BA
	0906-100-5	0.906~0.924	1.000	1.299	4.528	2.362	8.110	TPD0906BA-0924BA
	0925-100-5	0.925~0.944	1.000	1.299	4.626	2.362	8.228	TPD0925BA-0944BA
	0945-125-5	0.945~0.964	1.250	1.693	4.724	2.362	8.504	TPD0945BA-0964BA
	0965-125-5	0.965~0.983	1.250	1.693	4.823	2.362	8.622	TPD0965BA-0983BA
	0984-125-5	0.984~1.003	1.250	1.693	4.921	2.362	8.780	TPD0984BA-1003BA
	1004-125-5	1.004~1.023	1.250	1.693	5.020	2.362	8.898	TPD1004BA-1023BA
	1024-125-5	1.024~1.062	1.250	1.693	5.118	2.362	9.016	TPD1024BA-1062BA
	1063-125-5	1.063~1.101	1.250	1.693	5.315	2.362	9.291	TPD1063BA-1101BA
	1102-125-5	1.102~1.141	1.250	1.693	5.512	2.362	9.528	TPD1102BA-1141BA
	1142-125-5	1.142~1.180	1.250	1.693	5.709	2.362	9.803	TPD1142BA-1180BA
	1181-125-3	1.181~1.219	1.250	1.693	5.906	2.362	10.000	TPD1181BA-1219BA
	1220-125-3	1.220~1.259	1.250	1.693	6.102	2.362	10.276	TPD1220BA-1259BA
	1260-125-3	1.260~1.298	1.250	1.693	6.299	2.362	10.433	TPD1260BA-1299BA

Applicable inserts **G36**

TPDB-8D



(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-8	0.394~0.412	0.625	0.787	3.150	1.890	5.709	TPD0394BA–0412BA
	0413-063-8	0.413~0.432	0.625	0.787	3.307	1.890	5.866	TPD0413BA–0432BA
	0433-063-8	0.433~0.452	0.625	0.787	3.465	1.890	6.024	TPD0433BA–0452BA
	0453-063-8	0.453~0.471	0.625	0.787	3.622	1.890	6.181	TPD0453BA–0471BA
	0472-063-8	0.472~0.491	0.625	0.787	3.780	1.890	6.378	TPD0472BA-0491BA
	0492-063-8	0.492~0.511	0.625	0.787	3.937	1.890	6.555	TPD0492BA-0511BA
	0512-063-8	0.512~0.530	0.625	0.787	4.094	1.890	6.772	TPD0512BA-0530BA
	0531-063-8	0.531~0.550	0.625	0.787	4.252	1.890	6.949	TPD0531BA-0550BA
	0551-063-8	0.551~0.570	0.625	0.787	4.409	1.890	7.126	TPD0551BA-0570BA
	0571-063-8	0.571~0.590	0.625	0.787	4.567	1.890	7.343	TPD0571BA-0590BA
	0591-075-8	0.591~0.609	0.750	0.984	4.724	1.969	7.598	TPD0591BA-0609BA
	0610-075-8	0.610~0.629	0.750	0.984	4.882	1.969	7.776	TPD0610BA-0629BA
	0630-075-8	0.630~0.649	0.750	0.984	5.039	1.969	7.953	TPD0630BA-0649BA
	0669-075-8	0.669~0.668	0.750	0.984	5.197	1.969	8.130	TPD0650BA-0668BA
	0670-075-8	0.670~0.688	0.750	0.984	5.354	1.969	8.346	TPD0669BA-0688BA
	0689-075-8	0.689~0.708	0.750	0.984	5.512	1.969	8.524	TPD0689BA-0708BA
	0709-100-8	0.709~0.727	1.000	1.299	5.669	2.205	8.937	TPD0709BA-0727BA
	0728-100-8	0.728~0.747	1.000	1.299	5.827	2.205	9.114	TPD0728BA-0747BA
	0748-100-8	0.748~0.767	1.000	1.299	5.984	2.205	9.331	TPD0748BA-0767BA
	0768-100-8	0.768~0.786	1.000	1.299	6.142	2.205	9.508	TPD0768BA-0786BA
	0787-100-8	0.787~0.806	1.000	1.299	6.299	2.205	9.685	TPD0787BA-0806BA
	0807-100-8	0.807~0.826	1.000	1.299	6.457	2.205	9.862	TPD0807BA-0826BA
	0827-100-8	0.827~0.845	1.000	1.299	6.614	2.362	10.079	TPD0827BA-0845BA
	0846-100-8	0.846~0.865	1.000	1.299	6.772	2.362	10.256	TPD0846BA-0865BA
	0866-100-8	0.866~0.885	1.000	1.299	6.929	2.362	10.433	TPD0866BA-0885BA
	0886-100-8	0.886~0.905	1.000	1.299	7.087	2.362	10.610	TPD0886BA-0905BA
	0906-100-8	0.906~0.924	1.000	1.299	7.244	2.362	10.827	TPD0906BA-0924BA
	0925-100-8	0.925~0.944	1.000	1.299	7.402	2.362	11.004	TPD0925BA-0944BA
	0945-125-8	0.945~0.964	1.250	1.693	7.559	2.362	11.339	TPD0945BA-0964BA
	0965-125-8	0.965~0.983	1.250	1.693	7.717	2.362	11.516	TPD0965BA-0983BA
	0984-125-8	0.984~1.003	1.250	1.693	7.874	2.362	11.732	TPD0984BA-1003BA
	1004-125-8	1.004~1.023	1.250	1.693	8.031	2.362	11.909	TPD1004BA-1023BA
	1024-125-8	1.024~1.062	1.250	1.693	8.189	2.362	12.087	TPD1024BA-1062BA
	1063-125-8	1.063~1.101	1.250	1.693	8.504	2.362	12.480	TPD1063BA-1101BA
	1102-125-8	1.102~1.141	1.250	1.693	8.819	2.362	12.835	TPD1102BA-1141BA
	1142-125-8	1.142~1.180	1.250	1.693	9.134	2.362	13.228	TPD1142BA-1180BA
	1181-125-3	1.181~1.219	1.250	1.693	9.449	2.362	13.543	TPD1181BA-1219BA
	1220-125-3	1.220~1.259	1.250	1.693	9.764	2.362	13.937	TPD1220BA-1259BA
	1260-125-3	1.260~1.298	1.250	1.693	10.079	2.362	14.213	TPD1260BA-1299BA

Applicable inserts **G36**

Convenient and quickly adjustable drill height

WPDC

Indexable drill clamped with center drill

Code System for Drill

WPDCA	1250	125	8

Type
Using W-type I/S center drill

Drill Dia.
1250 : Ø1.250
238256 : Ø2.38~2.56

Shank Dia.
125 : Ø1.25
150 : Ø1.50

Aspect ratio
5 : 5D
6.5 : 6.5D
8 : 8D

Code System for Cartridge

CWP	2125	C

Type
CWP : Cartridge-WPDC

Drill Dia.
2125 : Ø2.125
238256 : Ø2.38~2.56

Classification
C : Central
P : Peripheral

Code System for Center Dril

CD(A)	H(A)	1035

Type
Center Dril

Coolant
H : Coolant
Unmarked : None

Diameter × Length of Tool
23612 : Ø0.236 X 1.2
31514 : Ø0.315 X 1.4
39414 : Ø0.394 X 1.4
47215 : Ø0.472 X 1.5
63018 : Ø0.630 X 1.8

Grade of Center Drill

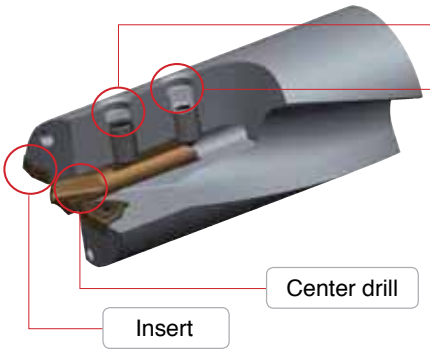
PC	40H

Product name
PVD coating

Coating layer
40H : TiN coating

How to clamp the drills

Feature of corn-point system



- ▶ Convenient and quick adjustable heights when inserting the center drill
- ▶ In case the center drill brakes while in usage, it can be replaced with the bolt for adjusting cone point.
- ▶ The bolt for adjusting cone point prevents chattering on the center drill.

Clamping

1

Place a center drill.

2

Clamp insert and cartridge.

3

Adjust the center drill with the bolt for adjusting cone point.

4

Clamp the center drill firmly with fixing bolt.

5

Reassure the clamp with bolt for adjusting cone point.

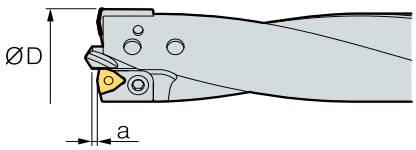
※ Caution

(1) Use safety covers for your safety when clamping the center drill and insert.

(2) When machining, be careful of the drill disk.

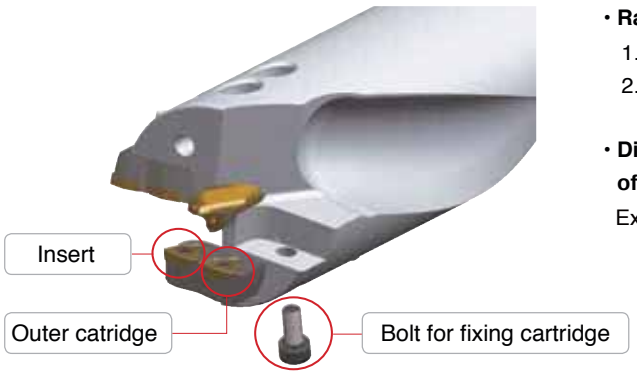
Length of the 'a' part of center drill

The length of 'a' being too short can cause badsurface finish or high cutting load.
On the other hand, the length of 'a' being too long can make tool failure and chattering while drilling.



Diameter (ØD)	Length of the 'a' part of center drill		
	Steel	Alloy steel	Non-ferrous metal
1.000~1.188	0.05	0.04	0.06
1.189~1.567	0.06	0.05	0.07
1.567~2.000	0.07	0.06	0.09
2.001~2.313	0.09	0.07	0.10
2.314~2.940	0.10	0.08	0.11
2.941~3.130	0.12	0.10	0.14

Adjusting diameter of cartridge type drill



- **Range of adjustable drill diameter**
  1. Single cartridge type(Drill diameter Ø1.625~Ø2.313) ···› -0.039inch
  2. Dual cartridge type(Drill diameter Ø2.380~Ø3.130) ···› -0.197inch

- **Diameter of the standard drills is provided with maximum size of standards.**
  Ex) WPDCA256275-150-8 ···› Drill diameter 2.75inch

- Disassemble a cartridge from the holder by loosening the bolt fixed for outer cartridge.
- Machine after calculating the hole size on the side of the outer cartridge.
- Trim the sharp part after machining.
- Clamp the bolt for fixing cartridge without any gap in between the holder and the machined outer cartridge.

Ex) How to adjust drill diameter to Ø2.60 machining with WPDCA256275-150-8
···› To make the drill diameter of outer cartridge to Ø2.60, machine 0.075inch. [Ø2.75 - Ø2.56 = 0.15 ···› 0.15 ÷ 2 = 0.075(radius)]

Recommended Cutting Condition

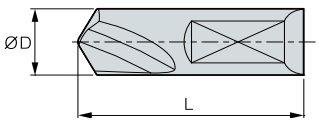
Workpiece				Chip Breaker	Grade	vc	Depth of cut = 5D, 6.5D, 8D Feed (ipr) depending on drill Dia.(inch)					
ISO		Workpiece	HB			sfm	~Ø1.188	Ø1.250~Ø1.563	Ø1.625~Ø1.938	Ø2.000~Ø2.313	Ø2.38~Ø2.94	Ø2.94~Ø3.13
P	Carbon steel	Low carbon steel (~0.25%)	80~180	C21N	PC5335	623(524~722)	0.0028~0.0043	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0047~0.0063	0.0047~0.0063
		High carbon steel (0.25%~)	180~280	C21N	PC5335	459(361~558)	0.0028~0.0043	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0047~0.0063	0.0047~0.0063
	Alloy steel	Low alloy steel	140~260	C21N	PC5335	426(328~525)	0.0031~0.0047	0.0031~0.0047	0.0039~0.0055	0.0047~0.0071	0.0047~0.0071	0.0047~0.0071
		High alloy steel	50~260	C21N	PC5335	328(230~426)	0.0024~0.0039	0.0031~0.0047	0.0031~0.0047	0.0039~0.0063	0.0039~0.0063	0.0039~0.0063
M	Stainless steel	Stainless steel	135~275	C21N	PC5335	328(230~426)	0.0024~0.0039	0.0031~0.0047	0.0039~0.0047	0.0047~0.0055	0.0047~0.0055	0.0047~0.0055
K	Cast iron	Gray cast iron	150~220	C21N	PC5335	525(426~623)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
		Ductile cast iron	200~300	C21N	PC5335	459(558~361)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
		Malleable cast iron	130~230	C21N	PC5335	492(591~394)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
N	Alloyed aluminum	Alloyed aluminum	30~150	C21N	PC5335	984(820~1148)	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0055~0.0071	0.0055~0.0071	0.0055~0.0071
	Alloyed copper	Alloyed copper	150~160	C21N	PC5335	820(656~984)	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0055~0.0071	0.0055~0.0071	0.0055~0.0071
S	Heat resisting alloy	Heat resisting alloy	130~400	C21N	PC5335	164(98~230)	0.0020~0.0031	0.0020~0.0031	0.0024~0.0039	0.0024~0.0039	0.0024~0.0039	0.0024~0.0039

Parts of WPDC type indexable drills

Deaignation		machining hole	Insert			Center drill			Catridge		
			Insert	Screw	Wrench	Center drill	fixed bolt	cone point bolt	Inner	Outer	Fixed bolt
WPDCA	1000-125-□	1.000	WC□T030204-C21N	FTKA02206	TW06P	CDA23612	KHA0508	KHC0510			
	1063-125-□	1.063	WC□T040204-C21N	FTKA02565	TW07S						
	1125-125-□	1.125									
	1188-125-□	1.188					KHA0510				
	1250-125-□	1.250	WC□T050308-C21N	FTKA0307	TW09S	CDA31514	KHA0610	KHC0610			
	1313-125-□	1.313									
	1375-125-□	1.375									
	1438-125-□	1.438					KHA0612				
	1500-125-□	1.500									
	1563-125-□	1.563									
	1625-150-□	1.625	WC□T06T308-C21N	FTKA03508	TW15S	CDHA39414	KHA0812	KHC0812	CWP16251750C	CWP1625P	BHA0510
	1688-150-□	1.688								CWP1688P	
	1750-150-□	1.750								CWP1750P	
	1813-150-□	1.813					KHA0815		CWP18131938C	CWP1813P	BHA0512
	1875-150-□	1.875								CWP1875P	
	1938-150-□	1.938								CWP1938P	
	2000-150-□	2.000	WC□T080408-C21N	FTKA0411K	TW15S	CDHA47215	KHA1015	KHC1016	CWP20002125C	CWP2000P	BHA0612
	2063-150-□	2.063								CWP2063P	
	2125-150-□	2.125								CWP2125P	
	2188-150-□	2.188							CWP21882313C	CWP2188P	BHA0614
	2250-150-□	2.250								CWP2250P	
	2313-150-□	2.313								CWP2313P	
	238256-150-□	2.38~2.56	WC□T050308-C21N	FTKA0307	TW09S		KHA1020	KHC1020	CWP238256C	CWP238256P	BHA0510
	256275-150-□	2.56~2.75							CWP256275C	CWP256275P	
	275294-150-□	2.75~2.94							CWP275294C	CWP275294P	
	294313-150-□	2.94~3.13	WC□T06T308-C21N	FTKA03508	TW15S	CDHA63018			CWP294313C	CWP294313P	BHA0612

Applicable inserts **G06**

Center drill



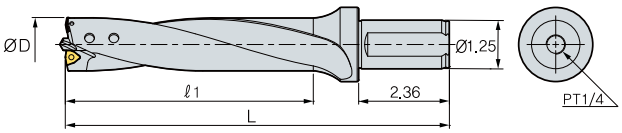
(inch)

Designation	Grade	ØD	L	Oil-hole
CDA 23612	PC40H	0.236	1.2	×
CDA 31514	PC40H	0.315	1.4	×
CDHA 39414	PC40H	0.394	1.4	○
CDHA 47215	PC40H	0.472	1.5	○
CDHA 63018	PC40H	0.630	1.8	○

• This is HSS with Tin coating

WPDC-5D/6.5D/8D

Standard type



(inch)

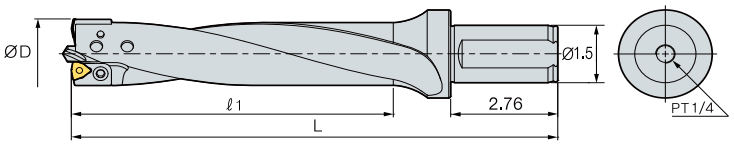
Designation		ØD	5D		6.5D		8D		Insert	Center drill
			ℓ1	L	ℓ1	L	ℓ1	L		
WPDCA	1000-125-□	1.000	5.91	9.45	7.28	10.83	8.66	12.20	WC□T030204-C21N	CDA23612
	1063-125-□	1.063							WC□T040204-C21N	
	1125-125-□	1.125								
	1188-125-□	1.188								
	1250-125-□	1.250	6.89	10.43	8.58	12.13	10.24	13.78	WC□T050308-C21N	CDA31514
	1313-125-□	1.313								
	1375-125-□	1.375								
	1438-125-□	1.438	7.87	11.42	9.84	13.39	11.81	15.35		
	1500-125-□	1.500								
	1563-125-□	1.563								

Applicable inserts G05

* We can provide if you order exact diameter
Ex) machining hole 1.225inch×6.5D ···› WPDCA1225-125-6.5

WPDC-5D/6.5D/8D

Single insert catridge type



(inch)

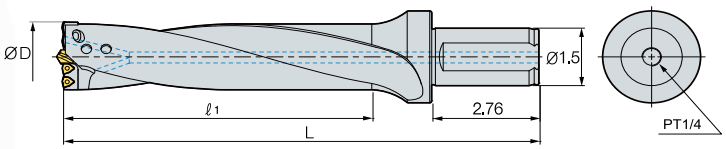
Designation		ØD	5D		6.5D		8D		Insert	Center drill	Catridge	
			ℓ_1	L	ℓ_1	L	ℓ_1	L			Inner	Outer
WPDCA	1625-150-□	1.625	8.86	12.99	11.14	15.28	13.39	17.52	WC□T06T308-C21N	CDHA39414	CWP16251750C	CWP1625P
	1688-150-□	1.688	8.86	12.99	11.14	15.28	13.39	17.52				CWP1688P
	1750-150-□	1.750	8.86	12.99	11.14	15.28	13.39	17.52				CWP1750P
	1813-150-□	1.813	9.84	13.98	12.4	16.54	14.96	19.09			CWP18131938C	CWP1813P
	1875-150-□	1.875	9.84	13.98	12.4	16.54	14.96	19.09				CWP1875P
	1938-150-□	1.938	9.84	13.98	12.4	16.54	14.96	19.09				CWP1938P
	2000-150-□	2.000	10.83	14.96	17.83	17.83	16.54	20.67	WC□T080408-C21N	CDHA7215	CWP20002125C	CWP2000P
	2063-150-□	2.063	10.83	14.96	17.83	17.83	16.54	20.67				CWP2063P
	2125-150-□	2.125	10.83	14.96	17.83	17.83	16.54	20.67				CWP2125P
	2188-150-□	2.188	11.81	15.94	14.96	19.09	18.11	22.24			CWP21882313C	CWP2188P
	2250-150-□	2.250	11.81	15.94	14.96	19.09	18.11	22.24				CWP2250P
	2313-150-□	2.313	11.81	15.94	14.96	19.09	18.11	22.24				CWP2313P

Applicable inserts G05

* We can provide if you order exact diameter
Ex) machining hole 1.800inch ×5D ···› WPDCA1800-150-5

WPDC-5D/6.5D/8D

Dual insert cartridge type



(inch)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Catridge	
			ℓ_1	L	ℓ_1	L	ℓ_1	L			Inner	Outer
WPDCA	**238256-150-□**	2.38~2.56	12.80	16.93	16.65	20.79	20.47	24.61	WC□T050308-C21N	CDHA47215	CWP238256C	CWP238256P
	256275-150-□	2.56~2.75	13.78	17.91	17.91	22.05	22.05	26.18			CWP256275C	CWP256275P
	275294-150-□	2.75~2.94	14.76	18.90	19.21	23.35	23.62	27.76			CWP275294C	CWP275294P
	294313-150-□	2.94~3.13	15.75	19.88	20.47	24.61	25.20	29.33	WC□T06T308-C21N	CDHA63018	CWP294313C	CWP294313P

Applicable inserts **G06**

* We can provide if you order exact diameter
Ex) machining hole 2.850inch ×6.5D -> WPDC2850-150-6.5

Highly efficient hole making for various workpieces including automobile components

MSD Plus New

Mach Solid Drill Plus

Code System

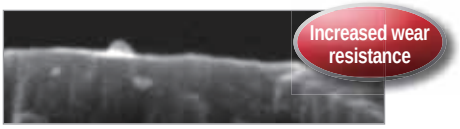
MSDP(H) A 01574 – 5 P

Oil hole	Inch unit	Drill Dia.(ØD)	Standard type	Machining area
None : MSDP With oil hole : MSDPH		Ø0.1574	Aspect ratio(L/D) 3D, 5D, 7D	P : Carbon steel, alloy steel M : Stainless steel K : Cast iron N : Aluminum, copper alloy

Features

New grade (PC325U)

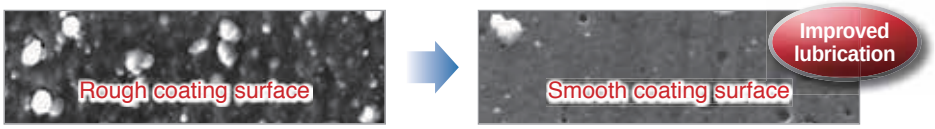
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

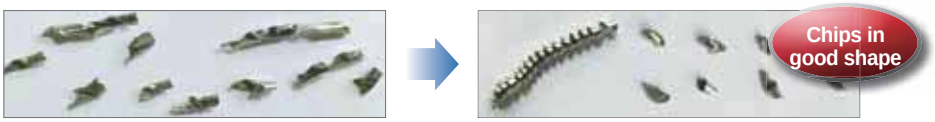
- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



Competitor | PC325U

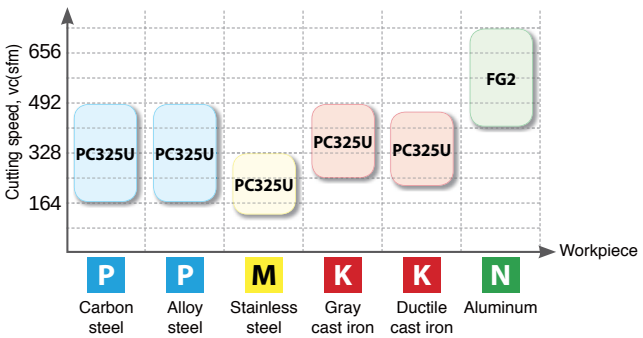
Chip control

- **Workpiece** : S30400
- **Cutting condition** : vc(sfm)=295
  fn(ipr)=0.008
  ap(inch)=1.181, wet
- **Tools :** MSDP(H)A02362-5M(PC325U)



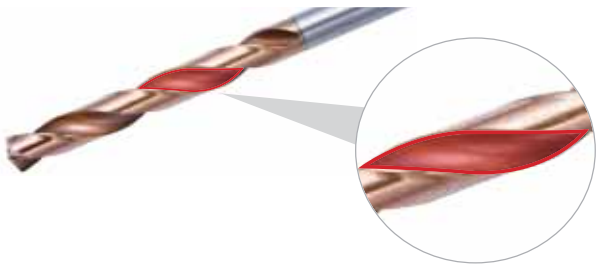
Competitor | MSD Plus

Application area



Flute shape

- Improved chip evacuation thanks to wider chip pocket



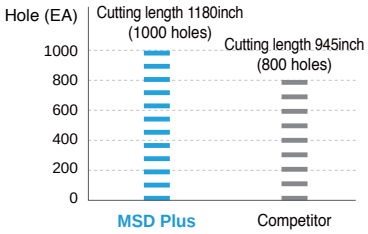
Cutting Performance

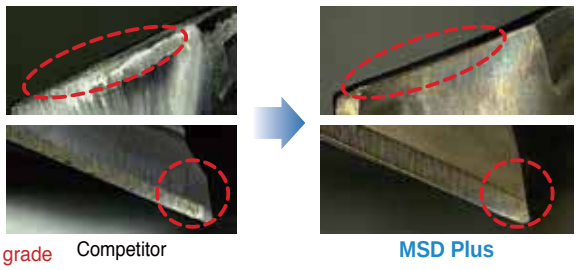
Part of automobile

■ **Workpiece** : 1045

■ **Cutting condition** : vc(sfm)=407
fn(ipr)=0.006
ap(inch)=1.181
Through coolant

■ **Tools :** MSDPHA02362-5P(PC325U)





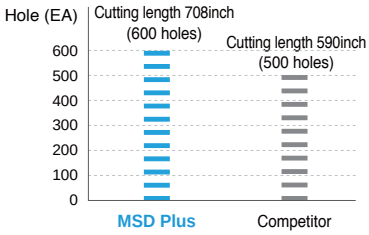
鰐 Lubricative coating layer of the new grade PC325U maximizes wear resistance.

Part of automobile

■ **Workpiece** : 1053

■ **Cutting condition** : vc(sfm)=197
fn(ipr)=0.010
ap(inch)=1.181
External coolant

■ **Tools :** MSDPA04724-5P(PC325U)



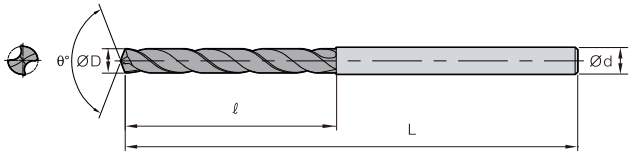
鰐 Special treatment on coating surface minimized frictional resistance.

Recommended Cutting Conditions

Workpiece				Grade	vc(sfm)	Depth of cut = 3D~7D Feed rate (ipr) per drill dia.(inch)				
ISO		Workpiece	HB			0.0984~0.1575	0.1614~0.3150	0.3189~0.4724	0.4764~0.6299	0.6339~0.7874
P	Carbon steel	Low carbon steel	80~120	PC325U	295 (492-262)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157
		High carbon steel	250 over	PC325U	164 (262-131)	0.0031-0.0078	0.0031-0.0078	0.0039-0.0098	0.0059-0.0098	0.0059-0.0118
	Alloy steel	Low alloy steel	140~260	PC325U	295 (492-262)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157
		Hardened low alloy steel	200~400	PC325U	196 (328-164)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157
		High alloy steel	50~260	PC325U	164 (262-131)	0.0031-0.0078	0.0031-0.0078	0.0039-0.0098	0.0059-0.0098	0.0059-0.0118
		Hardened high alloy steel	250 over	PC325U	164 (262-131)	0.0031-0.0078	0.0031-0.0078	0.0039-0.0098	0.0059-0.0098	0.0059-0.0118
M	Stainless steel	Austenite series	135~275	PC325U	147 (262-82)	0.0019-0.0078	0.0019-0.0078	0.0039-0.0098	0.0039-0.0098	0.0059-0.0118
		Ferrite series Martensite series	135~275	PC325U	164 (262-98)	0.0019-0.0078	0.0019-0.0078	0.0039-0.0098	0.0039-0.0098	0.0059-0.0118
K	Cast iron	Gray cast iron	150~230	PC325U	328 (492-262)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157
		Ductile cast iron	160~260	PC325U	295 (459-229)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157
N	Aluminum	Aluminum alloy	30~150	FG2	492 (721-410)	0.0094-0.0149	0.0149-0.0208	0.0208-0.0295	0.0240-0.0334	0.0267-0.0385
	Copper alloy	Copper alloy	150~160	FG2	492 (721-410)	0.0039-0.0059	0.0062-0.0094	0.0078-0.0118	0.0098-0.0141	0.0118-0.0157

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied.
• In case of external coolant system, reduce the above feed values by 20%.

MSDP-□ (P/M/K/N) New



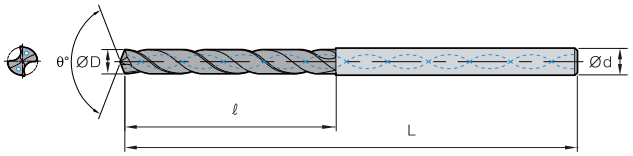
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDPA	00393 - □P,M,K,N	0.0394	0.1181	0.236	1.772	0.472	2.598	-	-
	00433 - □P,M,K,N	0.0433	0.1181	0.276	1.772	0.472	2.598	-	-
	00469 - □P,M,K,N	3/64, 0.0469	0.1181	0.276	1.772	0.472	2.598	-	-
	00472 - □P,M,K,N	0.0472	0.1181	0.315	1.772	0.472	2.598	-	-
	00511 - □P,M,K,N	0.0512	0.1181	0.315	1.772	0.472	2.598	-	-
	00551 - □P,M,K,N	0.0551	0.1181	0.354	1.772	0.472	2.598	-	-
	00590 - □P,M,K,N	0.0591	0.1181	0.354	1.772	0.472	2.598	-	-
	00626 - □P,M,K,N	1/16, 0.0626	0.1181	0.354	1.772	0.472	2.598	-	-
	00629 - □P,M,K,N	0.0630	0.1181	0.394	1.772	0.591	2.598	-	-
	00669 - □P,M,K,N	0.0669	0.1181	0.394	1.772	0.591	2.598	-	-
	00708 - □P,M,K,N	0.0709	0.1181	0.433	1.772	0.591	2.598	-	-
	00748 - □P,M,K,N	0.0748	0.1181	0.433	1.772	0.591	2.598	-	-
	00780 - □P,M,K,N	5/64, 0.0780	0.1181	0.433	1.772	0.591	2.598	-	-
	00787 - □P,M,K,N	0.0787	0.1181	0.551	2.087	0.787	2.598	-	-
	00826 - □P,M,K,N	0.0827	0.1181	0.551	2.087	0.787	2.598	-	-
	00866 - □P,M,K,N	0.0866	0.1181	0.551	2.087	0.787	2.598		
	00905 - □P,M,K,N	0.0906	0.1181	0.551	2.087	0.787	2.598		
	00937 - □P,M,K,N	3/32, 0.0937	0.1181	0.551	2.087	0.787	2.598		
	00944 - □P,M,K,N	0.0945	0.1181	0.551	2.087	0.787	2.598		

MSDP(H)-□ (P/M/K/N) New



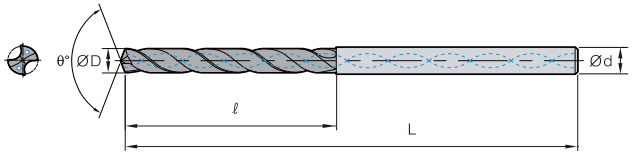
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through / External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	00984 - □P,M,K,N	0.0984	0.1181	0.551	2.087	0.787	2.598	1.181	2.756
	01023 - □P,M,K,N	0.1024	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01062 - □P,M,K,N	0.1063	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01094 - □P,M,K,N	7/64, 0.1094	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01102 - □P,M,K,N	0.1102	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01141 - □P,M,K,N	0.1142	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01181 - □P,M,K,N	0.1181	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01220 - □P,M,K,N	0.1220	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01248 - □P,M,K,N	1/8, 0.1248	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01259 - □P,M,K,N	0.1260	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01279 - □P,M,K,N	0.1280	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01299 - □P,M,K,N	0.1299	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01338 - □P,M,K,N	0.1339	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01377 - □P,M,K,N	0.1378	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01405 - □P,M,K,N	9/64, 0.1406	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01417 - □P,M,K,N	0.1417	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01456 - □P,M,K,N	0.1457	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01496 - □P,M,K,N	0.1496	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01535 - □P,M,K,N	0.1535	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01562 - □P,M,K,N	5/32, 0.1563	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01574 - □P,M,K,N	0.1575	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01590 - □P,M,K,N	0.1591	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01614 - □P,M,K,N	0.1614	0.1969	0.945	2.441	1.417	3.228	1.476	2.953
	01653 - □P,M,K,N	0.1654	0.1969	0.945	2.441	1.417	3.228	1.476	2.953
	01692 - □P,M,K,N	0.1693	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01720 - □P,M,K,N	11/64, 0.1720	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01732 - □P,M,K,N	0.1732	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01771 - □P,M,K,N	0.1772	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01811 - □P,M,K,N	0.1811	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01830 - □P,M,K,N	0.1831	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01850 - □P,M,K,N	0.1850	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01874 - □P,M,K,N	3/16 0.1874	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01889 - □P,M,K,N	0.1890	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	01929 - □P,M,K,N	0.1929	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	01968 - □P,M,K,N	0.1969	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	02007 - □P,M,K,N	0.2008	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02011 - □P,M,K,N	0.2012	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02031 - □P,M,K,N	13/64, 0.2031	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02047 - □P,M,K,N	0.2047	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02066 - □P,M,K,N	0.2067	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02086 - □P,M,K,N	0.2087	0.2362	1.102	2.598	1.732	3.228	1.969	3.543

MSDP(H)-□ (P/M/K/N) New



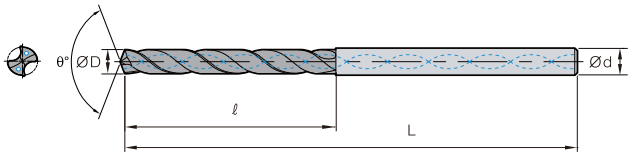
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through / External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	02125 - □P,M,K,N	0.2126	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02129 - □P,M,K,N	0.2130	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02165 - □P,M,K,N	0.2165	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02185 - □P,M,K,N	0.2185	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02188 - □P,M,K,N	7/32, 0.2189	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02204 - □P,M,K,N	0.2205	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02244 - □P,M,K,N	0.2244	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02283 - □P,M,K,N	0.2283	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02322 - □P,M,K,N	0.2323	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02342 - □P,M,K,N	15/64, 0.2343	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02362 - □P,M,K,N	0.2362	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02401 - □P,M,K,N	0.2402	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02440 - □P,M,K,N	0.2441	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02480 - □P,M,K,N	0.2480	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02500 - □P,M,K,N	1/4, 0.2500	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02519 - □P,M,K,N	0.2520	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02559 - □P,M,K,N	0.2559	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02570 - □P,M,K,N	0.2571	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02598 - □P,M,K,N	0.2598	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02637 - □P,M,K,N	0.2638	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02657 - □P,M,K,N	17/64, 0.2657	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02677 - □P,M,K,N	0.2677	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02716 - □P,M,K,N	0.2717	0.2756	1.339	2.913	1.969	3.583	2.992	4.567
	02755 - □P,M,K,N	0.2756	0.2756	1.339	2.913	1.969	3.583	2.992	4.567
	02795 - □P,M,K,N	0.2795	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02811 - □P,M,K,N	9/32, 0.2811	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02834 - □P,M,K,N	0.2835	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02874 - □P,M,K,N	0.2874	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02913 - □P,M,K,N	0.2913	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02952 - □P,M,K,N	0.2953	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02968 - □P,M,K,N	19/64, 0.2969	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02992 - □P,M,K,N	0.2992	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03031 - □P,M,K,N	0.3031	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03070 - □P,M,K,N	0.3071	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03110 - □P,M,K,N	0.3110	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03125 - □P,M,K,N	5/16, 0.3126	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03149 - □P,M,K,N	0.3150	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03188 - □P,M,K,N	0.3189	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03228 - □P,M,K,N	0.3228	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03267 - □P,M,K,N	0.3268	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03279 - □P,M,K,N	21/64, 0.3280	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03307 - □P,M,K,N	0.3307	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03346 - □P,M,K,N	0.3346	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03385 - □P,M,K,N	0.3386	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03425 - □P,M,K,N	0.3425	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03437 - □P,M,K,N	11/32, 0.3437	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03464 - □P,M,K,N	0.3465	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03503 - □P,M,K,N	0.3504	0.3543	1.693	3.307	2.283	3.858	3.425	5.157

MSDP(H)-□ (P/M/K/N) New



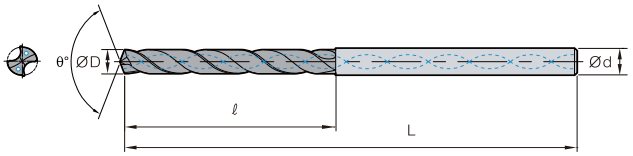
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through / External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	03543 - □P,M,K,N	0.3543	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03582 - □P,M,K,N	0.3583	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03594 - □P,M,K,N	23/64, 0.3594	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03622 - □P,M,K,N	0.3622	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03641 - □P,M,K,N	0.3642	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03661 - □P,M,K,N	0.3661	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03677 - □P,M,K,N	0.3677	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03700 - □P,M,K,N	0.3701	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03740 - □P,M,K,N	0.3740	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03748 - □P,M,K,N	3/8, 0.3748	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03779 - □P,M,K,N	0.3780	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03818 - □P,M,K,N	0.3819	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03858 - □P,M,K,N	0.3858	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03897 - □P,M,K,N	0.3898	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03905 - □P,M,K,N	25/64, 0.3906	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03937 - □P,M,K,N	0.3937	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03976 - □P,M,K,N	0.3976	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04015 - □P,M,K,N	0.4016	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04055 - □P,M,K,N	0.4055	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04062 - □P,M,K,N	13/32, 0.4063	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04094 - □P,M,K,N	0.4094	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04133 - □P,M,K,N	0.4134	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04173 - □P,M,K,N	0.4173	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04212 - □P,M,K,N	0.4213	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04220 - □P,M,K,N	27/64, 0.4220	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04251 - □P,M,K,N	0.4252	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04291 - □P,M,K,N	0.4291	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04330 - □P,M,K,N	0.4331	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04370 - □P,M,K,N	0.4370	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04374 - □P,M,K,N	7/16, 0.4374	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04409 - □P,M,K,N	0.4409	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04448 - □P,M,K,N	0.4449	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04488 - □P,M,K,N	0.4488	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04527 - □P,M,K,N	0.4528	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04531 - □P,M,K,N	29/64, 0.4531	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04566 - □P,M,K,N	0.4567	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04606 - □P,M,K,N	0.4606	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04645 - □P,M,K,N	0.4646	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04685 - □P,M,K,N	0.4685	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04688 - □P,M,K,N	15/32, 0.4689	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04724 - □P,M,K,N	0.4724	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04763 - □P,M,K,N	0.4764	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04803 - □P,M,K,N	0.4803	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04842 - □P,M,K,N	31/64, 0.4843	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04881 - □P,M,K,N	0.4882	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04921 - □P,M,K,N	0.4921	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04960 - □P,M,K,N	0.4961	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05000 - □P,M,K,N	1/2, 0.5000	0.5118	2.362	4.213	3.031	4.882	5.236	7.165

MSDP(H)-□ (P/M/K/N) New



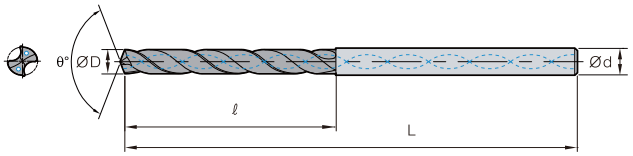
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through / External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	05039 - □P,M,K,N	0.5039	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05078 - □P,M,K,N	0.5079	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05118 - □P,M,K,N	0.5118	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05157 - □P,M,K,N	0.5157	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05196 - □P,M,K,N	0.5197	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05236 - □P,M,K,N	0.5236	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05275 - □P,M,K,N	0.5276	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05311 - □P,M,K,N	17/32, 0.5311	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05314 - □P,M,K,N	0.5315	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05354 - □P,M,K,N	0.5354	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05393 - □P,M,K,N	0.5394	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05433 - □P,M,K,N	0.5433	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05468 - □P,M,K,N	35/64, 0.5469	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05472 - □P,M,K,N	0.5472	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05511 - □P,M,K,N	0.5512	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05551 - □P,M,K,N	0.5551	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05590 - □P,M,K,N	0.5591	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05625 - □P,M,K,N	9/16, 0.5626	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05629 - □P,M,K,N	0.5630	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05669 - □P,M,K,N	0.5669	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05708 - □P,M,K,N	0.5709	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05748 - □P,M,K,N	0.5748	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05779 - □P,M,K,N	37/64, 0.5780	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05787 - □P,M,K,N	0.5787	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05826 - □P,M,K,N	0.5827	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05866 - □P,M,K,N	0.5866	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05905 - □P,M,K,N	0.5906	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05937 - □P,M,K,N	19/32, 0.5937	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05944 - □P,M,K,N	0.5945	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	05984 - □P,M,K,N	0.5984	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06023 - □P,M,K,N	0.6024	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06062 - □P,M,K,N	0.6063	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06094 - □P,M,K,N	39/64, 0.6094	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06102 - □P,M,K,N	0.6102	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06141 - □P,M,K,N	0.6142	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06181 - □P,M,K,N	0.6181	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06220 - □P,M,K,N	0.6220	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06248 - □P,M,K,N	5/8, 0.6248	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06259 - □P,M,K,N	0.6260	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06299 - □P,M,K,N	0.6299	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06330 - □P,M,K,N	0.6331	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06338 - □P,M,K,N	0.6339	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06377 - □P,M,K,N	0.6378	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06405 - □P,M,K,N	41/64, 0.6406	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06417 - □P,M,K,N	0.6417	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06456 - □P,M,K,N	0.6457	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06496 - □P,M,K,N	0.6496	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06535 - □P,M,K,N	0.6535	0.6693	2.874	4.843	3.661	6.024	6.732	8.780

MSDP(H)-□ (P/M/K/N) New



Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through / External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

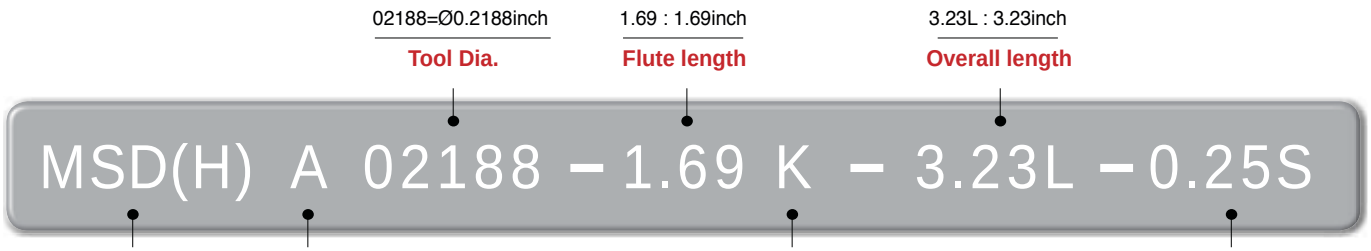
(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	06562 - □P,M,K,N	21/32, 0.6563	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06574 - □P,M,K,N	0.6575	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06614 - □P,M,K,N	0.6614	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06653 - □P,M,K,N	0.6654	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06692 - □P,M,K,N	0.6693	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06720 - □P,M,K,N	43/64, 0.6720	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06732 - □P,M,K,N	0.6732	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06771 - □P,M,K,N	0.6772	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06811 - □P,M,K,N	0.6811	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06850 - □P,M,K,N	0.6850	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06874 - □P,M,K,N	11/16, 0.6874	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06889 - □P,M,K,N	0.6890	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06929 - □P,M,K,N	0.6929	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06968 - □P,M,K,N	0.6969	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07007 - □P,M,K,N	0.7008	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07031 - □P,M,K,N	45/64, 0.7031	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07047 - □P,M,K,N	0.7047	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07086 - □P,M,K,N	0.7087	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07125 - □P,M,K,N	0.7126	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07165 - □P,M,K,N	0.7165	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07188 - □P,M,K,N	23/32. 0.7189	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07204 - □P,M,K,N	0.7205	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07244 - □P,M,K,N	0.7244	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07283 - □P,M,K,N	0.7283	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07322 - □P,M,K,N	0.7323	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07362 - □P,M,K,N	0.7362	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07401 - □P,M,K,N	0.7402	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07440 - □P,M,K,N	0.7441	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07480 - □P,M,K,N	0.7480	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07500 - □P,M,K,N	3/4, 0.7500	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07519 - □P,M,K,N	0.7520	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07543 - □P,M,K,N	0.7543	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07559 - □P,M,K,N	0.7559	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07578 - □P,M,K,N	0.7579	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07598 - □P,M,K,N	0.7598	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07637 - □P,M,K,N	0.7638	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07655 - □P,M,K,N	49/64, 0.7656	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07677 - □P,M,K,N	0.7677	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07716 - □P,M,K,N	0.7717	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07755 - □P,M,K,N	0.7756	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07795 - □P,M,K,N	0.7795	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07811 - □P,M,K,N	25/32, 0.7811	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07834 - □P,M,K,N	0.7835	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07874 - □P,M,K,N	0.7874	0.7874	3.110	5.157	4.213	6.024	7.480	9.606

Various designations of MSD & MSDH enable to do any drilling

Mach solid drill

Code system



Features

▶ Optimally designed chip pocket
- Wide and deep chip pocket improve chip control to minimizing friction during an operation

▶ A curvilinear edge
- A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load

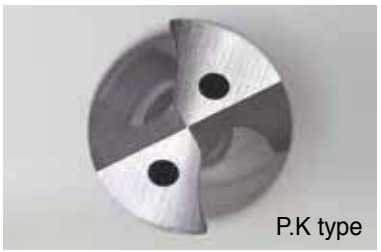
▶ 3D, 5D, 7D Standardization
- For example) diameter Ø0.394inch and depth 1.181inch and outer coolant system, Take MSDA100-3P!

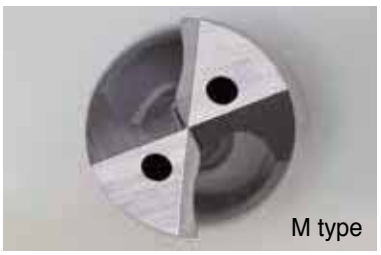
▶ MSDA : Solid Type & MSDHA : Through oil-hole type
- Various designations of MSDA & MSDHA enable to do any drilling

▶ Low cutting resistance edge
- The MSDA & MSDHA low cutting resistance edge guarantees a better surface roughness and chip control while allowing the drill to center itself

▶ Rigid neck of drill
- The new design of this drill has an increased rigidity at neck. This prevents breakage of neck on the drill

▶ Line-up as per workpiece
- P : Steel (Carbon steel, Alloy steel) General - Carbon steel, Alloy steel, Stainless steel, Cast iron Low cutting resistance edge, Ultra micro grain substrate, K-Black coating
- K : Cast iron, Die casting, Ductile cast iron Coolant system : Through / Outer(MQL)
- M : Stainless steel, Reduced built-up edge and cutting resistance Coolant system : Through / Outer(MQL)
- N : Aluminum(Carbide drills), Medium & Low speed cutting performance Coolant system : Through / Outer(MQL)
- ND : Non-ferrous metal, High speed, High efficiency performance Improved welding resistance due to applied DLC coating Coolant system : Through / Outer(MQL)


P.K type


M type


ND type

Features

▶ Low cutting resistance edge

- Uniformity in cutting edge treatment : Reinforces equalized quality in every machined part
- Protecting workpiece : Low cutting resistance edge operates well in medium to finishing machining, workpiece protection and good surface roughness
- Better chip breaking : Based on our cutting processes studies, our drills assure better chip breaking in high or low speeds

▶ Features of TiAlN Coating

- Decreasing of micro particle → Chipping free from macro particle
- Better hardness and toughness → Covering wide cutting speed and feed rate range
- Special coating layer at most-outer edge → Special TiAlN with better lubrication guarantees welding resistance
- Pre-treatment before coating process → Higher adhesion by pre-treatment

Specification line-up

Line-up as per aspect ratio (L:Overall length, D:Tool Dia.)

MSDA□□□-7P

MSDA□□□-5P

MSDA□□□-3P

Line-up as per aspect ratio (Mach Drills : Ø0.2188inch~Ø0.7500inch)
Various choices as per aspect ratio (3D,5D,7D)

Line-up as per coolant type

MSD Type

MSDH Type

Wide choices for coolant type
- For example) Solid type : MSD,
  Through coolant type : MSDH

Line-up as per workpiece

P	General - Carbon steel, Alloy steel, Stainless steel, Cast iron
M	Stainless steel
K	Cast iron, Aluminum
N	Aluminum, Brass
ND	Non-ferrous metal

Cutting condition formula

$$vc = \frac{\pi x D x n}{12}\ (sfm)\ ,\quad fn = \frac{vf}{n}\ (ipr)\quad \left[\ n = \frac{vcx12}{\pi x D}\ (min^{-1}),\ \ vf = fn \times n\ (rpm)\ \right]$$

n : Revolution per minute(min^{-1})　vf : Feed per minute(ipm)　D : Drill Dia.(inch)
vc : Cutting speed(sfm)　fn : Feed per revolution(ipr)　π : 3.1416

Recommended cutting condition

Mach Drill : Solid Type [MSDA ○○○-□P,M,K)

Workpiece \ Tool Dia.		Ø0.008 ~ Ø0.1969		Ø0.2008~ Ø0.3150		Ø0.3189~ Ø0.3937		Ø0.3976~ Ø0.4724		Ø0.4764~ Ø0.5512		Ø0.5551~ Ø0.7874	
		vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)
Mild steel, Alloy steel, General steel (Under HRC25)	4140	132~231 (181.5)	0.0059 ~0.0098	165~363 (214.5)	0.0079 ~0.0138	165~363 (231)	0.0079 ~0.0138	165~396 (247.5)	0.0098 ~~0.0138	165~396 (247.5)	0.0098 ~~0.0138	198~396 (264)	0.0098 ~0.0157
	1045	132~264 (198)	0.0059 ~0.0098	165~396 (231)	0.0079 ~0.0118	165~369 (247.5)	0.0079 ~0.0118	198~396 (264)	0.0079 ~0.0118	198~396 (264)	0.0098 ~0.0138	231~396 (297)	0.0118 ~0.0157
High alloy steel, High carbon steel (Over HRC25)	D2	49.5~115.5 (99)	0.0031 ~0.0061	66~132 (99)	0.0039 ~0.0079	66~165 (115.5)	0.0039 ~0.0079	66~198 (115.5)	0.0059 ~0.0098	66~198 (132)	0.0059 ~0.0098	99~214.5 (132)	0.0059 ~0.0098
Stainless steel	304	49.5~99 (82.5)	0.0020 ~0.0039	49.5~148.5 (82.5)	0.0039 ~0.0079	49.5~165 (99)	0.0039 ~0.0079	66~198 (115.5)	0.0039 ~0.0079	66~214.5 (115.5)	0.0039 ~0.0079	66~231 (132)	0.0039 ~0.0079
Cast iron	No 20B	132~297 (231)	0.0059 ~0.0118	165~396 (264)	0.0079 ~0.0138	165~396 (264)	0.0079 ~0.0138	198~429 (297)	0.0098 ~0.0138	198~429 (313.5)	0.0098 ~0.0157	198~462 (313.5)	0.0098 ~0.0157
	60-40-18	132~264 (198)	0.0039 ~0.0098	165~363 (247.5)	0.0079 ~0.0138	165~363 (264)	0.0079 ~0.0138	165~429 (264)	0.0098 ~0.0138	165~429 (280.5)	0.0098 ~0.0138	198~429 (297)	0.0098 ~0.0157

Mach Drill : Through oil-hole Type [MSDHA ○○○-□P,M,K)

Workpiece \ Tool Dia.		vc(sfm)	Ø0.0984~ Ø0.1575	Ø0.1614~ Ø0.3150	Ø0.3189~ Ø0.4724	Ø0.4764~ Ø0.6299	Ø0.6339~ Ø0.7874
			fn(ipr)	fn(ipr)	fn(ipr)	fn(ipr)	fn(ipr)
Mild steel, Alloy steel, General steel (Under HRC25)	SCM440	4140	0.0059~0.0138	0.0059~0.0138	0.0079~0.0138	0.0098~0.0157	0.0118~0.0157
	SM45C	1045	0.0059~0.0118	0.0059~0.0118	0.0079~0.0118	0.0098~0.0138	0.0118~0.0157
High alloy steel, High carbon steel (Over HRC25)	STD11	D2	0.0031~0.0079	0.0031~0.0079	0.0039~0.0098	0.0059~0.0098	0.0059~0.0118
Stainless steel	STS	304	0.0020~0.0079	0.0020~0.0079	0.0039~0.0098	0.0039~0.0098	0.0059~0.0118
Cast iron	GC	No 20 B	0.0059~0.0138	0.0059~0.0138	0.0079~0.0138	0.0098~0.0157	0.0098~0.0157
	GCD	60-40-18	0.0039~0.0138	0.0039~0.0138	0.0079~0.0138	0.0098~0.0138	0.0098~0.0157

Note) 1. Decrease cutting speed 30%~40% contrast with recommended condition when machining forged steel
2. Decrease cutting condition considering the overhang of drill, machined rigidity, precision of spindle, clamping and surface of workpiece, etc.
3. For longer tool life, Please apply to step feed at every 1.5D
4. Put the drill clamping between edge groove and shank boundary part in order to be located in the suitable position
5. Coolant pressure for through hole type = 3~5kg/cm^3, volume = 2~5l/min
6. Cutting formula :

Mach Drills : Through coolant type [MSD(H)A ○○○-□N) cemented carbide

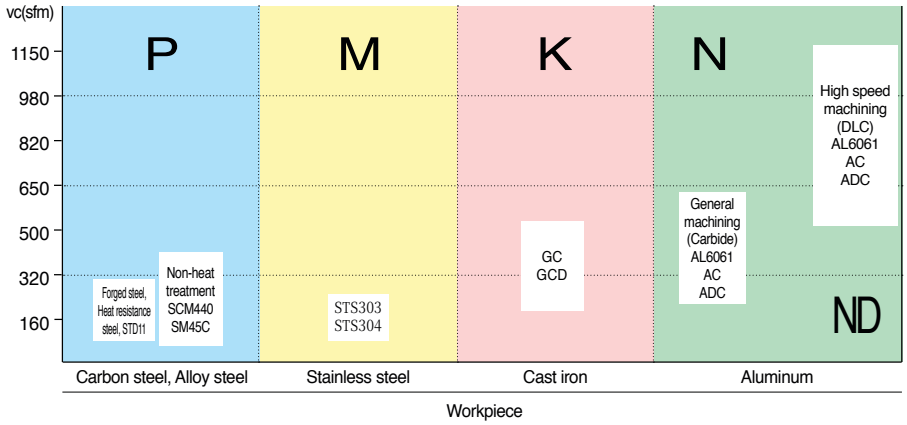
Workpiece \ Tool Dia.		Ø0.0984~ Ø0.1575		Ø0.2165~ Ø0.2765		Ø0.3346~ Ø0.3937		Ø0.4528~ Ø0.5118	
		vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)
Aluminum	Alloy steel (Al6061)	200~330	0.0079~0.0138	300~330	0.0118~0.0157	330~400	0.0118~0.0157	330~400	0.0118~0.0177
	Die-casting (AC,ADC)	200~330	0.0079~3.5433	330~330	0.0118~0.0157	330~400	0.0118~0.0157	330~400	0.0118~0.0177
Copper alloy(CII00)		200~260	0.0031~0.0059	200~330	0.0039~0.0079	260~330	0.0039~0.0098	260~330	0.0039~0.0098

Mach Drills : Through coolant type [MSDHA ○○○-□ND) DLC coated

Workpiece \ Tool Dia.		Ø0.0984~ Ø0.1575		Ø0.2165~ Ø0.2765		Ø0.3346~ Ø0.3937		Ø0.4528~ Ø0.5118	
		vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)	vc(sfm)	fn(ipr)
Aluminum	Alloy steel (Al6061)	260~530	0.0031~0.0118	260~600	0.0047~0.0138	260~600	0.0059~0.0157	260~600	0.0059~0.0177
	Die-casting (AC,ADC)	260~600	0.0031~0.0118	260~660	0.0047~0.0138	260~660	0.0059~0.0157	260~660	0.0059~0.0177
Copper alloy(CII00)		260~530	0.0031~0.0059	260~600	0.0039~0.0079	260~600	0.0039~0.0098	260~600	0.0039~0.0098

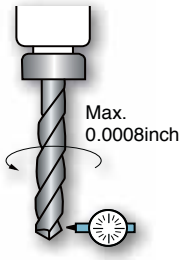
Note) Recommended cutting speed is one of the important factors for the drill performance. In case of using further cutting speed or feed rate than recommended conditions to improve the productivity, please apply it after enough tests because it could be occurred some problems like early wear, built-up edge, chipping, fracture, etc.

Recommended cutting condition by series

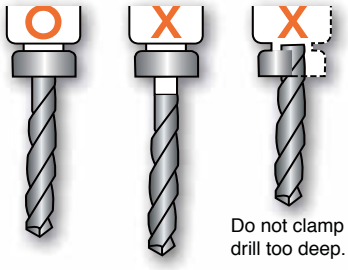


Setting of drills

Outer tolerance

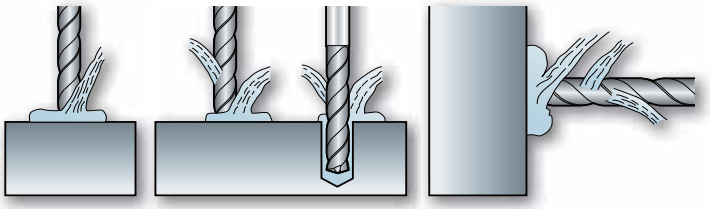


Setting condition



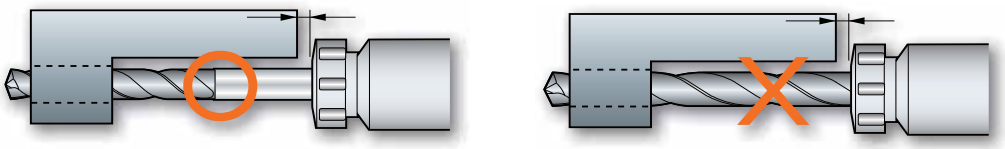
Do not clamp the drill too deep.

Coolant (External system)



To improve machining method

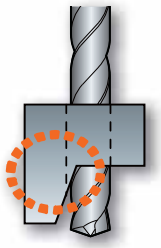
Machining for strength of wheel



Using short flute lengeh

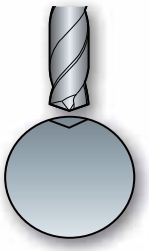
Improvement of drilling

Piercing stage



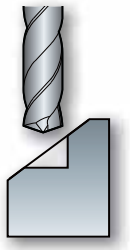
Decrease feed 1/2

Circular surface



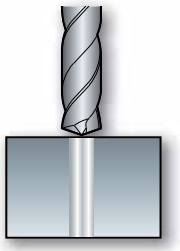
First, center drilling with large point angle

Inclined surface



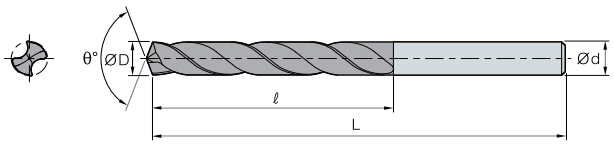
First, facing with endmills

Boring



No recommendation

MSD(P/M/K/N)



Terminology	P	M	K	N
Grade	TiAlN			Cemented carbide
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		Diameter (ØD)		Shank dia (Ød)	Flute length (ℓ)	Overall length (L)
MSDA	02188	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	03281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05
	03906	25/64	0.3906	0.4375	2.60	4.37
	04063	13/32	0.4063	0.4375	2.60	4.37
	04219	27/64	0.4219	0.4375	2.60	4.37
	04375	7/16	0.4375	0.4375	2.60	4.37
	04531	29/64	0.4531	0.5000	2.75	4.64
	04688	15/32	0.4688	0.5000	2.75	4.64
	04844	31/64	0.4844	0.5000	2.75	4.64
	05000	1/2	0.5000	0.5000	2.75	4.64
	05625	9/16	0.5625	0.5625	2.99	4.88
	06250	5/8	0.6250	0.6250	3.23	5.23
	06875	11/16	0.6875	0.6875	3.62	5.63
	07500	3/4	0.7500	0.7500	3.74	5.82

※ Order made items : MSDA□ □ □-Material (P,M,K,N) - Flute length - Total length L - Shank diameter S

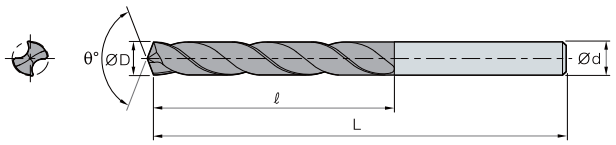
Ex.1) Workpiece : SM45C(1045)

Machined diameter : Ø0.3906inch, Flute length : 2.16inch, Total length : 4.37inch, Shank diameter : Ø0.4375 → MSDA03906-P × 2.16 - 4.37L × 0.4375S

MSDH(P/M/K/N/ND)

Terminology	P	M	K	N	ND
Grade	TiAlN			Cemented carbide	DLC
Tolerance(drill Dia.)	h7				
Tolerance(shank Dia.)	h6				
Point angle	140°			135°	140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through system				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(inch)

Designation		Diameter (ØD)		Shank dia (Ød)	Flute length (ℓ)	Overall length (L)
MSDHA	02188	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	03281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05
	03906	25/64	0.3906	0.4375	2.60	4.37
	04063	13/32	0.4063	0.4375	2.60	4.37
	04219	27/64	0.4219	0.4375	2.60	4.37
	04375	7/16	0.4375	0.4375	2.60	4.37
	04531	29/64	0.4531	0.5000	2.75	4.64
	04688	15/32	0.4688	0.5000	2.75	4.64
	04844	31/64	0.4844	0.5000	2.75	4.64
	05000	1/2	0.5000	0.5000	2.75	4.64
	05625	9/16	0.5625	0.5625	2.99	4.88
	06250	5/8	0.6250	0.6250	3.23	5.23
	06875	11/16	0.6875	0.6875	3.62	5.63
	07500	3/4	0.7500	0.7500	3.74	5.82

※ Order made items : MSDHA□ □ □-Material (P,M,K,N) - Flute length - Total length L - Shank diameter S

Ex.1) Workpiece : SM45C(1045)

Machined diameter : Ø0.3906inch, Flute length : 2.16inch, Total length : 4.37inch, Shank diameter : Ø0.4375 → MSDHA03906-P × 2.16 - 4.37L × 0.4375S

High precision results when machining deep holes

MLD Plus New

Mach Long Solid Drill Plus

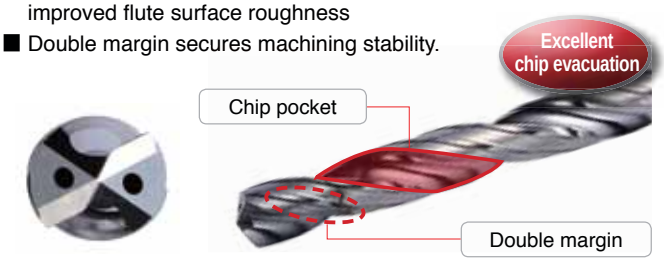
Code System

MLD	A	02362N	–	10	P
Mach Long Solid Drill Plus (MLD Plus)	Inch unit	Drill Dia.(ØD)		Standard type	Machining area
		Ø0.2362		Aspect ratio(L/D) 10D, 15D, 20D, 25D	P : Carbon steel, alloy steel K : Cast iron N : Aluminum, copper alloy

Features

Cutting edge and flute shape

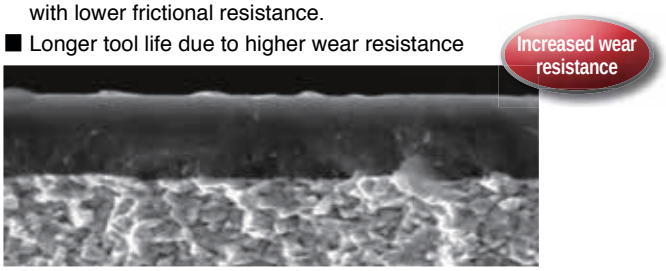
- Straight cutting edge provides better rigidity.
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability.



Cutting edge shape

New grade(PC315G)

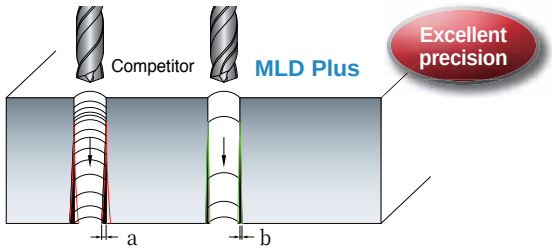
- Ultra fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance.
- Longer tool life due to higher wear resistance



PC315G

Degree of machining precision

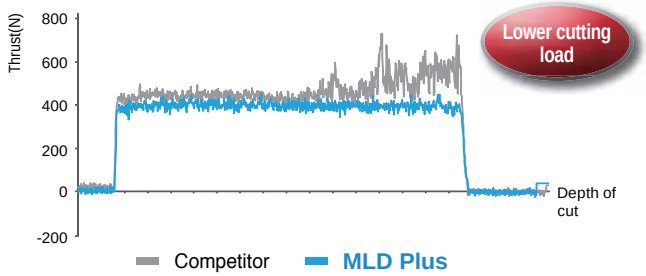
- Improved machining precision
  - Bent holes reduced
  - Inside hole surface roughness improved
  - Hole size uniformity increased
- Improved point shape
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

Cutting load

- **Workpiece** : 1045
- **Cutting condition** : Drill Dia.(m) = Ø0.2362, vc(sfm) = 295 fn(ipr)=0.0078, ap(inch)=2.3622, wet
- **Tools :** MLDA02362N-20P



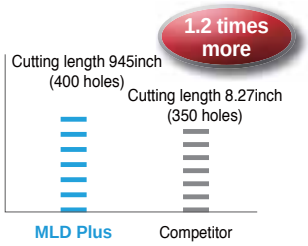
Cutting Performance

Part of automobile

■ **Workpiece** : 1045

■ **Cutting condition** : vc(sfm)=230
fn(ipr) = 0.0047
ap(inch) = 2.3622
Through coolant

■ **Tools :** MLDA01574N-20P (PC315G)



Comparison of wear

Competitor MLD Plus

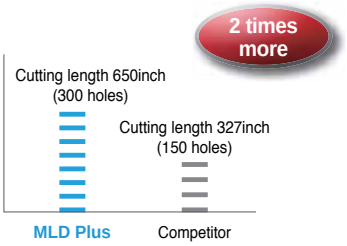
鰯 New grade PC315G's coating layer has been applied to improve wear resistance when machining carbon steel materials.

Part of automobile

■ **Workpiece** : 4140(H)

■ **Cutting condition** : vc(sfm)=230
fn(ipr) = 0.0047
ap(inch) = 2.1653
Through coolant(MQL)

■ **Tools :** MLDA02244N-15P (PC315G)

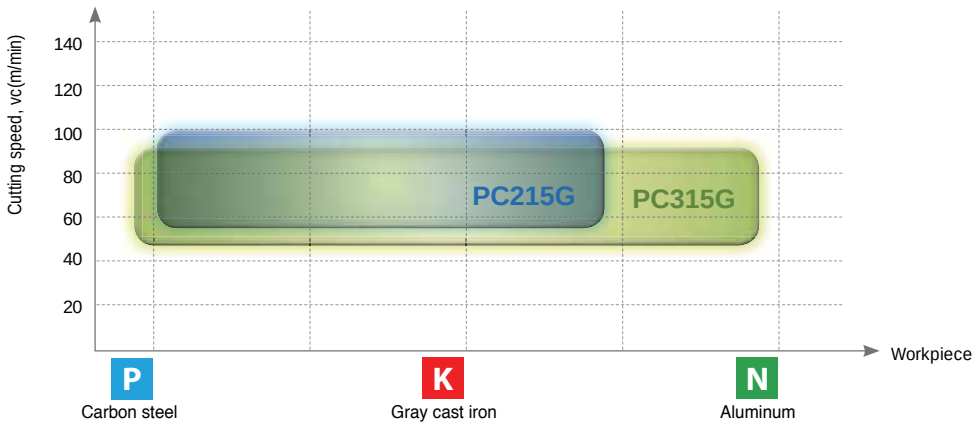


鰯 Double margin has been applied to improve stability and machining precision.

Application Area

▶ **PC215G** - Excellent performance when machining cast iron and alloy steel at high speed

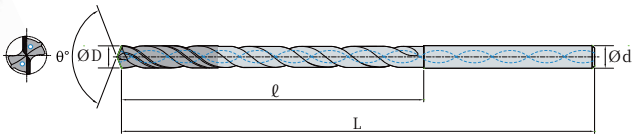
▶ **PC315G** - Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



Recommended Cutting Condition

Workpiece				Grade	Cutting speed vc(sfm)	Depth of cut = 10D~25D Feed rate (ipr) per drill dia.(inch)		
ISO		Workpiece	HB	Recommended		0.1181~0.1969	0.2008~0.3150	0.3189~0.3937
P	Carbon steel	Low carbon steel	80~120	PC315G	262 (295-196)	0.0039-0.0059	0.0059-0.0078	0.0078-0.0098
		High carbon steel	180~280	PC315G	229 (262-196)	0.0039-0.0059	0.0059-0.0078	0.0078-0.0098
	Alloy steel	Low alloy steel	140~260	PC215G	262 (295-196)	0.0039-0.0059	0.0047-0.0066	0.0059-0.0078
		Low carbon steel	50-260	PC215G	229 (262-196)	0.0031-0.0059	0.0039-0.0059	0.0059-0.0078
K	Cast iron	Gray cast iron	150-230	PC215G	262 (328-196)	0.0039-0.0078	0.0059-0.0078	0.0059-0.0078
		Ductile cast iron	160-260	PC215G	229 (262-196)	0.0039-0.0078	0.0059-0.0078	0.0059-0.0078
N	Aluminum	Aluminum alloy	30-150	FG2	393 (492-328)	0.0047-0.0066	0.0059-0.0078	0.0078-0.0098
	Copper alloy	Copper alloy	150-160	FG2	393 (492-328)	0.0047-0.0066	0.0059-0.0078	0.0078-0.0098

MLD-□□(P/K/N) New



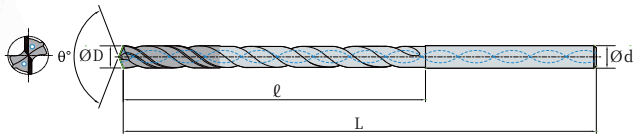
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through system		

P Steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	01181N - □□P,K,N	0.1181	0.1181	1.5748	3.5433	2.1654	4.1339	2.7559	4.7244	-	-
	01220N - □□P,K,N	0.1220	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01248N - □□P,K,N	1/8, 0.1248	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01259N - □□P,K,N	0.1260	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01279N - □□P,K,N	0.1280	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01299N - □□P,K,N	0.1299	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01338N - □□P,K,N	0.1339	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01377N - □□P,K,N	0.1378	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01405N - □□P,K,N	9/64, 0.1406	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01417N - □□P,K,N	0.1417	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01456N - □□P,K,N	0.1457	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01496N - □□P,K,N	0.1496	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	-	-
	01535N - □□P,K,N	0.1535	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	-	-
	01562N - □□P,K,N	5/32, 0.1563	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	5.3150	7.4803
	01574N - □□P,K,N	0.1575	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	4.5276	6.4961
	01590N - □□P,K,N	0.1591	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	4.5276	6.4961
	01614N - □□P,K,N	0.1614	0.1969	2.1654	4.5276	2.9528	5.5118	3.9370	6.4961	4.7244	7.4803
	01653N - □□P,K,N	0.1654	0.1969	2.1654	4.5276	2.9528	5.5118	3.9370	6.4961	4.7244	7.4803
	01692N - □□P,K,N	0.1693	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01720N - □□P,K,N	11/64, 0.1720	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01732N - □□P,K,N	0.1732	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01771N - □□P,K,N	0.1772	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01811N - □□P,K,N	0.1811	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01830N - □□P,K,N	0.1831	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01850N - □□P,K,N	0.1850	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01874N - □□P,K,N	3/16, 0.1874	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01889N - □□P,K,N	0.1890	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803
	01929N - □□P,K,N	0.1929	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803
	01968N - □□P,K,N	0.1969	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803

MLD-□□(P/K/N) New



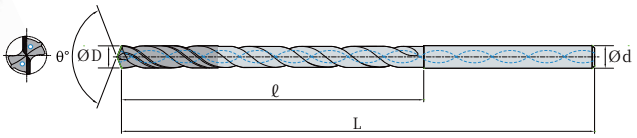
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through system		

P Steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	02007N - □□P,K,N	0.2008	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02011N - □□P,K,N	0.2012	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02031N - □□P,K,N	13/64, 0.2031	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02047N - □□P,K,N	0.2047	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02066N - □□P,K,N	0.2067	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02086N - □□P,K,N	0.2087	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02125N - □□P,K,N	0.2126	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02129N - □□P,K,N	0.2130	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02165N - □□P,K,N	0.2165	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02185N - □□P,K,N	0.2185	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02188N - □□P,K,N	7/32, 0.2189	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02204N - □□P,K,N	0.2205	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02244N - □□P,K,N	0.2244	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02283N - □□P,K,N	0.2283	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02322N - □□P,K,N	0.2323	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02342N - □□P,K,N	15/64, 0.2343	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02362N - □□P,K,N	0.2362	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02401N - □□P,K,N	0.2402	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02440N - □□P,K,N	0.2441	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02480N - □□P,K,N	0.2480	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02500N - □□P,K,N	1/4, 0.2500	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02519N - □□P,K,N	0.2520	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02559N - □□P,K,N	0.2559	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02570N - □□P,K,N	0.2571	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02598N - □□P,K,N	0.2598	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02637N - □□P,K,N	0.2638	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02657N - □□P,K,N	17/64, 0.2657	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02677N - □□P,K,N	0.2677	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02716N - □□P,K,N	0.2717	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02755N - □□P,K,N	0.2756	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02795N - □□P,K,N	0.2795	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02811N - □□P,K,N	9/32, 0.2811	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02834N - □□P,K,N	0.2835	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02874N - □□P,K,N	0.2874	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02913N - □□P,K,N	0.2913	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02952N - □□P,K,N	0.2953	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02968N - □□P,K,N	19/64, 0.2969	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02992N - □□P,K,N	0.2992	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-

MLD-□□(P/K/N) New



Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through system		

P Steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	03031N - □□P,K,N	0.3031	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03070N - □□P,K,N	0.3071	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03110N - □□P,K,N	0.3110	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03125N - □□P,K,N	5/16, 0.3126	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03149N - □□P,K,N	0.3150	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03188N - □□P,K,N	0.3189	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03228N - □□P,K,N	0.3228	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03267N - □□P,K,N	0.3268	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03279N - □□P,K,N	21/64, 0.3280	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03307N - □□P,K,N	0.3307	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03346N - □□P,K,N	0.3346	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03385N - □□P,K,N	0.3386	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03425N - □□P,K,N	0.3425	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03437N - □□P,K,N	11/32, 0.3437	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03464N - □□P,K,N	0.3465	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03503N - □□P,K,N	0.3504	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03543N - □□P,K,N	0.3543	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03582N - □□P,K,N	0.3583	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03594N - □□P,K,N	23/64, 0.3594	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03622N - □□P,K,N	0.3622	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03641N - □□P,K,N	0.3642	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03661N - □□P,K,N	0.3661	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03677N - □□P,K,N	0.3677	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03700N - □□P,K,N	0.3701	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03740N - □□P,K,N	0.3740	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03748N - □□P,K,N	3/8, 0.3748	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03779N - □□P,K,N	0.3780	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03818N - □□P,K,N	0.3819	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03858N - □□P,K,N	0.3858	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03897N - □□P,K,N	0.3898	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03905N - □□P,K,N	25,64, 0.3906	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03937N - □□P,K,N	0.3937	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-

Stable deep hole drilling with specially designed low cutting resistance

Mach Long Solid Drill

- Over 20D deep hole drlling is possible without step drilling
- The stable hole drilling due to specially designed low cutting resistance
- Special chip pocket has designed for effective chip evacuation
- Optimized design for drill rigidity to prevent the bending of the drill when entering operation
- The lubrication & thermal resistance of coating has been increased by adapting new TiAlN

Code system

Special type

MLD(P)A 02500 – 169 – 323L × 025S

Type
Mach Long Drill : MLD
Pilot Drills For MLD : MLDP

Tool Dia.
02500=Ø0.2500

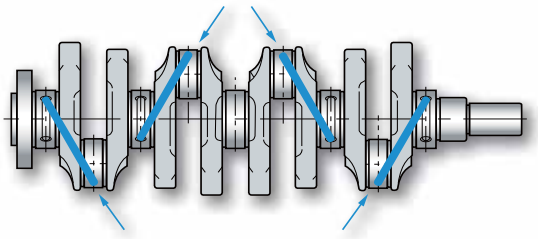
MLDP
FLUTE length
169 = 1.69inch

MLD
Depth of drilling
169 = D X 1.69

Overall length
323L : 3.23inch

Shank Dia.
025S : Ø0.2500

Mach Long Drills - Deep hole drilling



Application example (Oil hole for crank shaft, 20D)

Mach Long Drills are ideal for.....

- ▶ Deep and inclined hole drilling of crank shaft
- ▶ Deep hole drilling of cam shaft
- ▶ Deep hole drilling of mold and machinery
  → Deep hole drilling aspect ratio over 15D

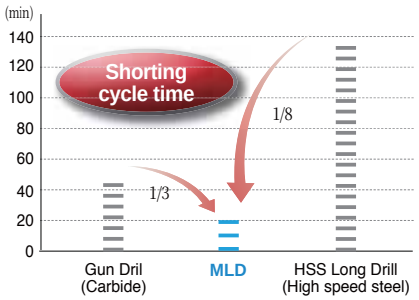
Advantages of MLD

- ▶ Shorting cycle time for better productivity
- ▶ Tool guide bush is not required
- ▶ Reduce idle time by prolonged tool life
- ▶ Green coolant solutions(MQL) to protect environment

MLDA productivity : MLDA02500-20A

Tool	vc(sfm)	fn(ipr)	n(min^{-1})	vf(ipm)	Coolant	Step operation
Gun Drills (Carbide)	328	0.002	4,683	7.362	Through coolant oil	No required
High Speed Steel Long Drills	49	0.004	703	2.756	Outer coolant oil	15mm / 9times
Mach Long Drills	262	0.006	3,747	20.669	MQL- Air 0.5MPa, Oil 20cc/h	No required

Cycle time

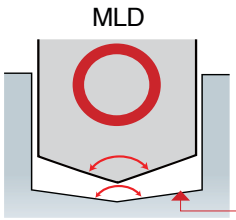


Advantages of MLD against conventional drills

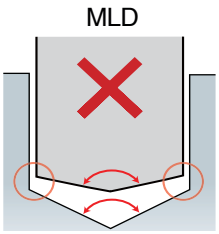
- ▶ Decreasing cycle time up to 1/3 ~ 1/8 times
- ▶ Increasing productivity by process reduction
- ▶ It is easy to reduce running cost
- ▶ Improving of effective working condition
- ▶ Drill guide bush is not required

Function of MLD & MLDP

Relationship of point angle between MLD & MLDP



Point angle of MLD < Point angle of foundation hole
→ Stable machining

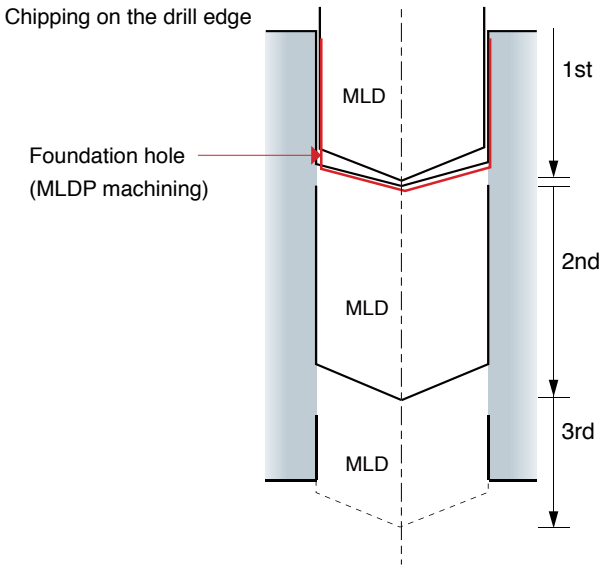


Point angle of MLD > Point angle of foundation hole
→ Chipping on the drill edge

Large point angle of Pliot Drill : Stable condition

Small point angle of Pliot Drill : Unstable condition

To make the optimal of MLD



1st. Pliot drilling
- vc(sfm) = Normal
- fn(ipr) = Normal

2nd. Deep drilling by MLD
Approach the drill 0.04inch less than the depth of MLDP drilling.
- vc(sfm) = 49
- fn(ipr) = 0.020

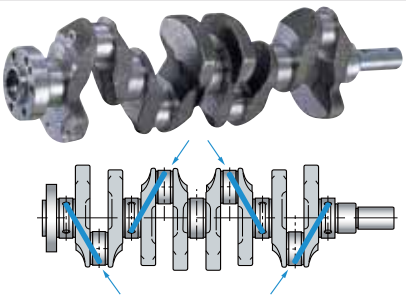
2nd MLD drilling (Machining stage)
- vc(sfm) = Normal
- fn(ipr) = Normal

3rd MLD drilling (Piercing stage)
- vc(sfm) = Normal
- fn(ipr) = Normal feed / 2

Application example

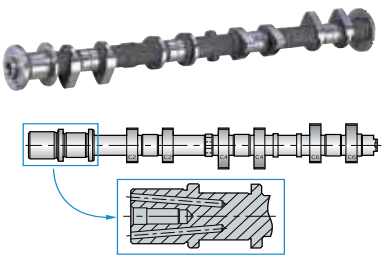
Part of automobile

- **Workpiece** — Part of automobile (4140, HB255~330)
- **Cutting condition** — vc(sfm) =230
fn(ipr)=0.007
MQL(30cc/hour)
Air(MPa)=0.7
- **Designation** — MLDA2362-22A (Ø0.2362inch, Aspect ratio 18D)
- **Machine** — Horizontal milling machine
- **Tool life** — 1000 holes



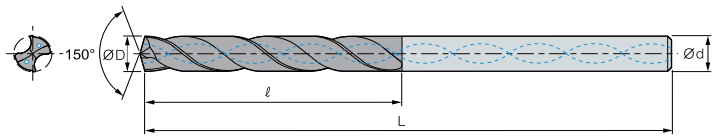
Part of automobile

- **Workpiece** — Part of automobile (No35B)
- **Cutting condition** — vc(sfm) = 207
fn(ipr)= 0.004
- **Designation** — MLDA01575-25A (Ø0.1575inch, Aspect ratio 16D)
- **Machine** — Rotary milling machine
- **Tool life** — 440 holes



MLDP(Mach long Drills)

Pilot Drills with oil hole for MLD



Coating	TiAlN
Tolerance(drill Dia.)	x6
Twist angle	30°
Tolerance	h6
Point angle	150°
Thinning	X type
Coolant	Through system

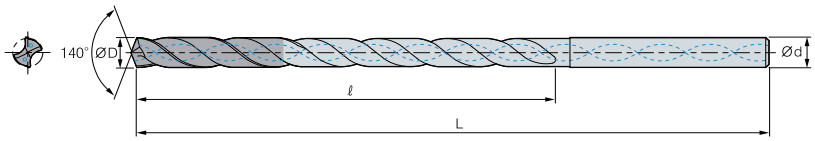
(inch)

Designation		ØD		Ød	ℓ	L
MLDPA	02188	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	03281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05

Order made items : MLDPA□□□□ × Flute length - Total length L × Shank diameter S
Ex.1) Machined diameter : Ø0.2500inch, Flute length : 1.69inch, Total length : 3.23inch, Shank diameter : 0.2500
MLDPA02500 × 1.69 - 3.23L × 0.25S

MLD(Mach long Drills)

Mach long drills with oil hole for deep hole machining



Grade	TiAlN
Tolerance(drill Dia.)	h7
Twist angle	30°
Tolerance	h6
Point angle	140°
Thinning	X type
Coolant	Through system

(inch)

Designation		ØD		Ød	20 (ℓ / ØD = 20)		25 (ℓ / ØD = 25)	
					ℓ	L	ℓ	L
MLDA	02188-□	7/32	0.2188	0.2500	4.33	6.33	5.47	7.47
	02500-□	1/4	0.2500	0.2500	5.00	7.00	6.26	8.26
	02656-□	17/64	0.2656	0.3125	5.31	7.31	6.65	8.65
	02813-□	9/32	0.2813	0.3125	5.63	7.63	7.05	9.05
	02969-□	19/64	0.2969	0.3125	5.91	7.91	7.44	9.44
	03125-□	5/16	0.3125	0.3125	6.26	8.26	7.83	9.83
	03281-□	21/64	0.3281	0.3750	6.57	8.57	8.19	10.19
	03438-□	11/32	0.3438	0.3750	6.89	8.89	-	-
	03594-□	23/64	0.3594	0.3750	7.20	9.20	-	-
	03750-□	3/8	0.3750	0.3750	7.48	9.48	-	-

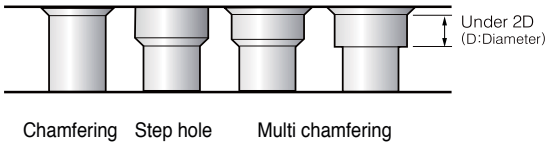
Order made items : MLDA□□□□-Aspect ratio
Ex.1) Machined diameter : Ø0.25inch, Flute length : 5inch, Total length : 7inch
MLDA02500-□(Aspect ratio)

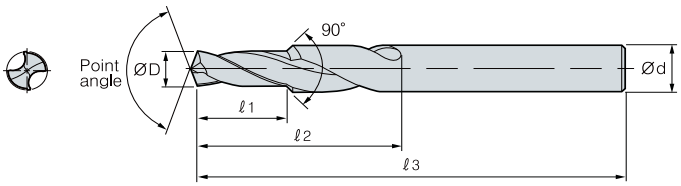
Tolerance code

Drill Dia. (ØD)		h6	h7	x6
Over	Under			
-	3	0 ~ – 0.006	0 ~ – 0.010	+ 0.020 ~ + 0.026
3	6	0 ~ – 0.008	0 ~ – 0.012	+ 0.028 ~ + 0.036
6	10	0 ~ – 0.009	0 ~ – 0.015	+ 0.034 ~ + 0.043
10	14	0 ~ – 0.011	0 ~ – 0.018	+ 0.040 ~ + 0.051
14	18	0 ~ – 0.011	0 ~ – 0.018	+ 0.045 ~ + 0.056
18	24	0 ~ – 0.013	0 ~ – 0.021	+ 0.054 ~ + 0.067

Code system for mach step drill

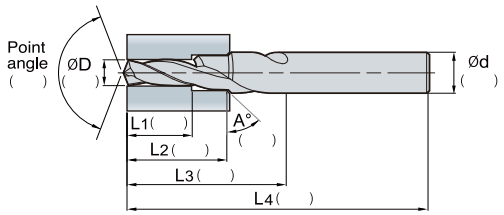
MSD(H)S	Tool Dia.	×	Effective flute length	–	Flute length	–	Overall length(L)	×	Shank Dia.(S)
Solid type : MSDS Oil-hole type : MSDHS	ØD		ℓ_1		ℓ_2		(ℓ_3)L		(Ød)S





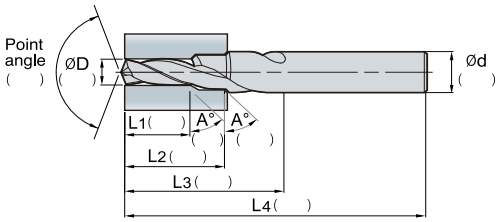
☐ Multi chamfering

(**Coolant** : Through system ☐ External system ☐)



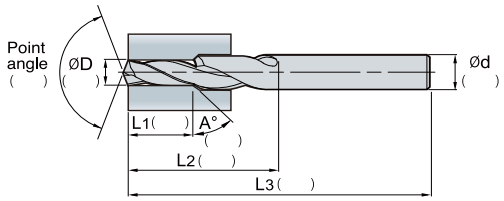
☐ Multi chamfering

(**Coolant** : Through system ☐ External system ☐)



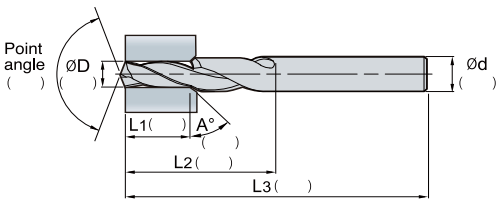
☐ Step hole

(**Coolant** : Through system ☐ External system ☐)



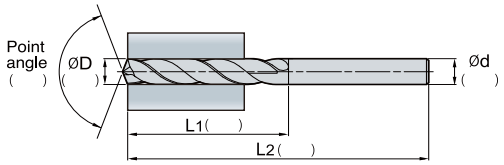
☐ Chamfering

(**Coolant** : Through system ☐ External system ☐)



☐ Drilling

(**Coolant** : Through system ☐ External system ☐)



High feed and precision machining with our specially designed point edge

Vulcan Drill

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining

Code system

205=Ø20.5 — Tool Dia.

100L : 100mm — FLUTE length

Special type

VZD 205 MA – 100 – 200L × 32S

Type	Workpiece	Overall length	Shank Dia.
Vulcan Drills	MA : General steel, Ductile cast iron MBA : Mild steel, Low carbon steel LA : General steel, Ductile cast iron LBA : Mild steel, Low carbon steel	200L : 200mm	32S : Ø32

M This is metric size. We can also provide in inch type

Application for Vulcan Drill

Workpiece - General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc

Notice

Unsuitable drilling

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1 ~ 0.15mm/rev when drilling at inclined and unevenness

Clamping of workpiece

- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

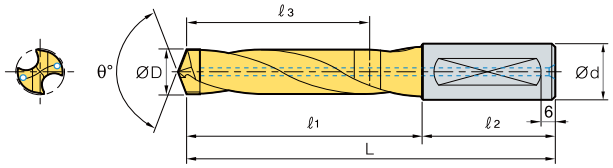
Recommended cutting condition

Form	Workpiece	Hardness	~Ø15		~Ø20		~Ø40	
			vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)
MA LA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (65)	0.15~0.30 (0.20)	40~90 (65)	0.20~0.40 (0.30)	40~90 (70)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	40~90 (60)	0.10~0.25 (0.20)	40~90 (60)	0.15~0.35 (0.25)	40~90 (65)	0.20~0.40 (0.30)
	Mold steel	HB250	40~70 (50)	0.10~0.25 (0.20)	40~70 (50)	0.15~0.30 (0.25)	40~70 (50)	0.20~0.35 (0.30)
	Stainless steel	HB250	30~50 (45)	0.10~0.20 (0.15)	30~50 (45)	0.15~0.25 (0.20)	30~50 (45)	0.20~0.30 (0.25)
	Ductile cast iron	-	50~100 (70)	0.20~0.35 (0.30)	50~100 (70)	0.20~0.40 (0.35)	50~100 (70)	0.25~0.50 (0.40)
MBA LBA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (75)	0.20~0.40 (0.30)	40~90 (75)	0.20~0.40 (0.30)	40~90 (80)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	35~80 (55)	0.15~0.30 (0.25)	35~80 (55)	0.15~0.30 (0.25)	40~80 (60)	0.15~0.40 (0.30)

M This is metric size. We can also provide in inch type

Vulcan Drill(VZD)-MA, MBA

Type	MA	MBA
Grade	PC230F	
Tolerance(drill Dia.)	h7	
Tolerance(shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Type	X type	
Coolant	Through system	



(mm)

Designation		ØD	Ød	L	ℓ_1	ℓ_2	ℓ_3
VZD	126~135MA, MBA	12.6~13.5	16	110	62	48	44
	136~145MA, MBA	13.6~14.5	16	115	67	48	48
	146~155MA, MBA	14.6~15.5	20	125	75	50	55
	156~165MA, MBA	15.6~16.5	20	130	80	50	59
	166~175MA, MBA	16.6~17.5	20	135	85	50	63
	176~185MA, MBA	17.6~18.5	20	140	90	50	66
	186~195MA, MBA	18.6~19.5	25	155	99	56	74
	196~205MA, MBA	19.6~20.5	25	155	99	56	73
	206~215MA, MBA	20.6~21.5	25	155	99	56	72
	216~225MA, MBA	21.6~22.5	25	160	104	56	76
	226~235MA, MBA	22.6~23.5	25	160	104	56	74
	236~245MA, MBA	23.6~24.5	32	170	110	60	79
	246~255MA, MBA	24.6~25.5	32	170	110	60	78
	256~265MA, MBA	25.6~26.5	32	175	115	60	82
	266~275MA, MBA	26.6~27.5	32	175	115	60	80
	276~285MA, MBA	27.6~28.5	32	180	120	60	84
	286~295MA, MBA	28.6~29.5	32	185	125	60	88
	296~305MA, MBA	29.6~30.5	32	185	125	60	87
	306~315MA, MBA	30.6~31.5	40	205	135	70	95
	316~325MA, MBA	31.6~32.5	40	210	140	70	98
	326~335MA, MBA	32.6~33.5	40	215	145	70	101
	336~345MA, MBA	33.6~34.5	40	220	150	70	104
	346~355MA, MBA	34.6~35.5	40	225	155	70	107
	356~365MA, MBA	35.6~36.5	40	225	155	70	110
	366~375MA, MBA	36.6~37.5	40	230	160	70	113
	376~385MA, MBA	37.6~38.5	40	235	165	70	116
	386~395MA, MBA	38.6~39.5	40	240	170	70	119
	396~405MA, MBA	39.6~40.5	40	245	175	70	122

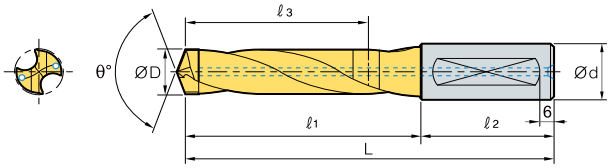
※ VZD□□□MA : For General steel, Ductile cast iron
MBA : For Mild steel, Low carbon steel

M This is metric size. We can also provide in inch type

※ Order made items : VZD□□□M□ × Flute length - Total length L
Ex.1) MA Type, Machined diameter : Ø18.6mm, Flute length : 110mm, Total length : 200mm
--- VZD186MA × 110-200L
Ex.2) MA Type, Machined diameter : Ø18.63, Flute length : 110mm, Total length : 200mm
--- VZD1863MA × 110-200L
Ex.3) MA Type, Machined diameter : Ø18.6, Standard
--- VZD186MA

Vulcan Drill(VZD) - LA, LBA

Type	LA	LBA
Grade	PC230F	
Tolerance(drill Dia.)	h7	
Tolerance(shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Type	X type	
Coolant	Through system	



(mm)

Designation		ØD	Ød	L	ℓ_1	ℓ_2	ℓ_3
VZD	126~135LA, LBA	12.6~13.5	16	140	92	48	74
	136~145LA, LBA	13.6~14.5	16	145	97	48	78
	146~155LA, LBA	14.6~15.5	20	155	105	50	85
	156~165LA, LBA	15.6~16.5	20	165	115	50	94
	166~175LA, LBA	16.6~17.5	20	170	120	50	98
	176~185LA, LBA	17.6~18.5	20	175	125	50	101
	186~195LA, LBA	18.6~19.5	25	190	134	56	109
	196~205LA, LBA	19.6~20.5	25	195	139	56	113
	206~215LA, LBA	20.6~21.5	25	195	139	56	112
	216~225LA, LBA	21.6~22.5	25	200	144	56	116
	226~235LA, LBA	22.6~23.5	25	210	154	56	124
	236~245LA, LBA	23.6~24.5	32	220	160	60	129
	246~255LA, LBA	24.6~25.5	32	225	165	60	133
	256~265LA, LBA	25.6~26.5	32	230	170	60	137
	266~275LA, LBA	26.6~27.5	32	235	175	60	141
	276~285LA, LBA	27.6~28.5	32	240	180	60	144
	286~295LA, LBA	28.6~29.5	32	245	185	60	148
	296~305LA, LBA	29.6~30.5	32	255	195	60	157
	306~315LA, LBA	30.6~31.5	40	275	205	70	166
	316~325LA, LBA	31.6~32.5	40	280	210	70	172
	326~335LA, LBA	32.6~33.5	40	280	215	70	173
	336~345LA, LBA	33.6~34.5	40	290	220	70	177
	346~355LA, LBA	34.6~35.5	40	295	225	70	181
	356~365LA, LBA	35.6~36.5	40	300	230	70	183
	366~375LA, LBA	36.6~37.5	40	305	235	70	188
	376~385LA, LBA	37.6~38.5	40	315	245	70	193
	386~395LA, LBA	38.6~39.5	40	320	250	70	198
	396~405LA, LBA	39.6~40.5	40	325	255	70	203

※ VZD□□□LA : For General steel, Ductile cast iron
LBA : For Mild steel, Low carbon steel

M This is metric size. We can also provide in inch type

※ Order made items : VZD□□□M□ × Flute length - Total length L
Ex.1) LA Type, Machined diameter : Ø18.6mm, Flute length : 110mm, Total length : 200mm
--- VZD186LA × 110-200L
Ex.2) LA Type, Machined diameter : Ø18.63, Flute length : 110mm, Total length : 200mm
--- VZD1863LA × 110-200L
Ex.3) LA Type, Machined diameter : Ø18.6, Standard
--- VZD186LA

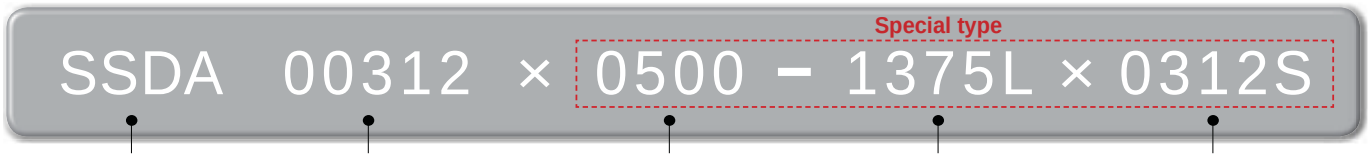
Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Carbide Drill

One of the most important aspects of hole-drilling is hole precision and the tool life of the drill.
These carbide drills are produced with a super fine exclusive substrate from Korloy designed to meet stress, hardness, and resistance to plastic deformation requirements of today's machining

- Long tool life by improving wear resistance and toughness for small hole drilling(Ø0.039inch~ Ø0.157inch)
- Increment of productivity by come true high feed because of specially designed cutting edge to low cutting resistance.(Ø0.157inch~ Ø0.590inch)
- Available to various workpiece as cast iron, non-ferrous metal, etc.
- Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Code system

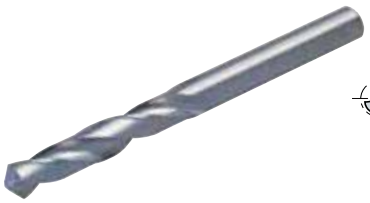


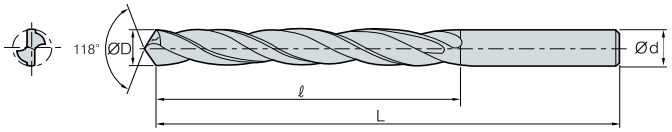
Type	Tool Dia.	FLUTE length	Overall length	Shank Dia.
Solid Spiral Drill	00312=Ø0.0312	0500 : 0.500inch	1375L : 1.375inch	0312S : Ø0.312

Recommended cutting condition

Workpiece	Strength	Revolution as per drill Dia.(min^{-1})							Feed as per drill Dia.(ipr)		Coolant
		Ø0.1969	Ø0.3937	Ø0.5906	Ø0.7874	Ø0.9843	Ø1.1811	Ø1.5748	Ø0.1969~Ø0.4724	Ø0.5906~Ø1.5748	
SM10C~SM45C	50	2900	1600	1100	1000	800	700	600	0.0012~0.0024	0.0012~0.0024	Cutting oil
SM55C	70	2300	1530	1050	920	765	640	560	0.0012~0.0024	0.0024~0.0047	Cutting oil
SM55C·Pre-hardened steel	100	2200	1500	1000	900	750	650	550	0.0012	0.0024	Cutting oil
Pre-hardened steel	150~180	700	340	250	190	160	140	120	0.0008	0.0016	Cutting oil
Cr-Ni steel	100	2200	1200	800	652	550	460	380	0.0012	0.0024	Cutting oil
Mn-steel	40~110	700	340	260	190	170	150	120	0.0016	0.0031	Dry
Casting	200~300	2000	1500	800	600	450	400	350	0.0012	0.0024	Dry
Malleable iron	200	2400	1500	900	650	500	420	380	0.0012	0.0024	Dry
Chiled casting	65Hs	350	200	150	100	80	70	55	0.0004	0.0008	Dry
Copper	60~80	6000	4000	2500	2000	1400	1000	800	0.0024	0.0047	Dry
Brass	80~120	5000	3500	2000	1500	1400	1200	1000	0.0020	0.0039	Dry
Bronze casting	60~120	3500	2500	1800	1500	1200	1000	900	0.0016	0.0031	Dry
Aluminum	60~120	16000	8500	5700	4500	3700	3100	2800	0.0039	0.0079	Dry
Al alloy (Si13%)	40	8000	4500	2800	2100	1750	1050	700	0.0020	0.0059	Dry
Synthetic resin	90~120	8000	5400	2800	2100	1750	1050	200	0.0020	0.0059	Dry

Carbide Drill-SSD





Coating	×
Tolerance(drill Dia.)	h8
Tolerance(shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	S type
Coolant	External system

(inch)

Designation		Flute diameter (ØD)		Shank dia (Ød)	Flute length (ℓ)	Overall length (L)
SSDA	00312	1/32	0.0312	0.0312	0.500	1.375
	00469	3/64	0.0469	0.0469	0.750	1.750
	00625	1/16	0.0625	0.0625	0.845	1.875
	00781	5/64	0.0781	0.0781	1.000	2.000
	00938	3/32	0.0938	0.0938	1.250	2.250
	01094	7/64	0.1094	0.1094	1.500	2.625
	01250	1/8	0.1250	0.1250	1.625	2.750
	01406	9/64	0.1406	0.1406	1.750	2.875
	01562	5/32	0.1562	0.1562	2.000	3.125

Drill diameter : Available from Ø0.024
Order made items : SSDA□□□ × Flute length - Total length L
Ex.1) Genetal type, Machined diameter : Ø0.845inch, Flute length : 0.845inch, Total length : 1.875inch --- SSDA00625 × 0.845 - 1.875L
Ex.2) Machined diameter : Ø0.0625inch --- Genetal type SSDA0625

Burnishing Drill

Recommended cutting condition

Workpiece	Cutting speed vc(m/min)	Feed rate (mm/rev) per drill dia.(mm)				
		Ø2.0~ 3.0	Ø3.5~ 5.0	Ø5.5~ 8.0	Ø8.5~ 12	Ø12.5~ 18
Aluminum alloy, Copper alloy	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Aluminum alloy for die castings	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Cast iron(GC) Ductile cast	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
iron(GCD)	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

Burnishing Drill - BDS

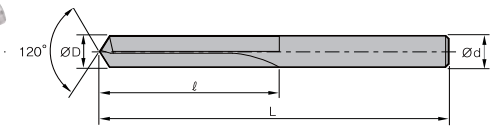


Fig.1

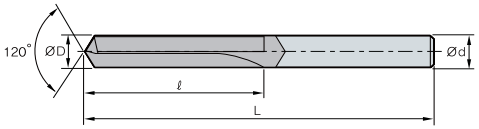


Fig.2

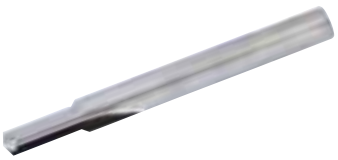
(mm)

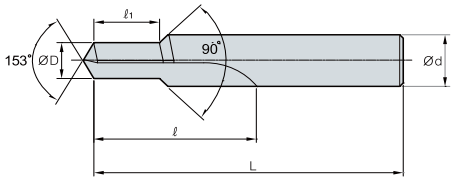
Designation		ØD	Ød	ℓ	L	Fig.
BDS	040S	4.0	4.0	35	80	1
	050S	5.0	5.0	40	85	1
	060S	6.0	6.0	50	95	1
	070S	7.0	7.0	55	100	1
	080S	8.0	8.0	65	110	1
	090S	9.0	9.0	70	120	1
	100S	10.0	10.0	80	130	1
	110S	11.0	11.0	90	140	1
	120B	12.0	12.0	95	150	2
	130B	13.0	16.0	105	160	2
	140B	14.0	16.0	110	170	2
	150B	15.0	16.0	120	185	2
	160B	16.0	16.0	125	190	2

M This is metric size. We can also provide in inch type

Step Burnishing Drill - BDT

For tapping a foundation hole





(mm)

Designation		ØD	Ød	ℓ	ℓ1	L	Tap
BDT	M05080-ℓ1	4.2	6.0	35	9~15	90	M5XP0.8
	M06100-ℓ1	5.0	7.0	40	11~18	95	M6XP1.0
	M08125-ℓ1	6.8	10.0	50	15~24	105	M8XP1.25
	M10125-ℓ1	8.8	12.0	55	17~30	110	M10XP1.25
	M10150-ℓ1	8.5	12.0	55	17~30	110	M10XP1.5
	M12125-ℓ1	10.8	14.0	60	19~36	120	M12XP1.25
	M12150-ℓ1	10.5	14.0	60	19~36	120	M12XP1.5
	M12175-ℓ1	10.3	14.0	60	19~36	120	M12XP1.75

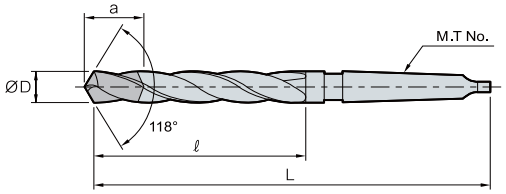
M This is metric size. We can also provide in inch type

Top Solid drill

Recommended cutting condition

Diameter	Cutting condition	Ductile cast iron	Gray cast iron	Soft steel
Ø0.030~Ø0.40	vc(sfm)	65~115	65~195	165~490
	fn(ipr)	0.008~0.016	0.008~0.016	0.004~0.008
Ø0.41~Ø0.60	vc(sfm)	100~230	100~260	230~655
	fn(ipr)	0.012~0.016	0.012~0.016	0.004~0.008
Ø0.61~Ø1.00	vc(sfm)	165~295	165~330	330~820
	fn(ipr)	0.012~0.018	0.012~0.020	0.004~0.008

Top Solid Drill - TSDM



(inch)

Designation		ØD	L	ℓ	a	M.T No
TSDMA	0310~0330	0.315~0.335	6.6	3.3	1.0	1
	0340~0350	0.337~0.354	6.8	3.5	1.0	1
	0360~0370	0.358~0.374	6.9	3.6	1.0	1
	0380~0390	0.378~0.394	7.0	3.7	1.0	1
	0400~0410	0.398~0.413	7.2	3.9	1.0	1
	0420~0430	0.417~0.433	7.3	4.0	1.0	1
	0440~0450	0.437~0.453	7.4	4.1	1.0	1
	0460~0470	0.457~0.472	7.6	4.3	1.0	1
	0480~0490	0.476~0.492	7.7	4.4	1.0	1
	0500~0510	0.496~0.512	7.8	4.5	1.0	2
	0520~0530	0.516~0.531	8.0	4.6	1.1	2
	0540~0550	0.535~0.551	8.1	4.8	1.1	2
	0560~0570	0.555~0.571	8.7	4.8	1.1	2
	0580~0590	0.575~0.590	8.9	4.9	1.1	2
	0600~0610	0.594~0.610	9.0	4.9	1.1	2
	0620~0630	0.614~0.630	9.1	5.1	1.1	2
	0640~0650	0.634~0.650	9.1	5.2	1.1	2
	0660~0670	0.654~0.669	9.2	5.3	1.1	2
	0680~0710	0.673~0.709	9.4	5.5	1.1	2
	0720~0750	0.713~0.748	9.6	5.7	1.2	2
	0760~0790	0.752~0.787	9.8	5.9	1.2	2
	0800~0830	0.791~0.827	10.0	6.1	1.2	2
	0840~0870	0.831~0.866	10.2	6.3	1.2	2
	0880~0910	0.870~0.906	10.4	6.5	1.2	2
	0920~0980	0.909~0.984	11.2	6.5	1.3	3

※ Ordrer form : TSDM125

High accuracy hole machining for aluminum alloy

PCD Drill

- High accuracy hole machining for aluminum alloy
- Drilling tolerance : IT7~8class
- Recommendation with high accuracy and high spindle machine

Code system

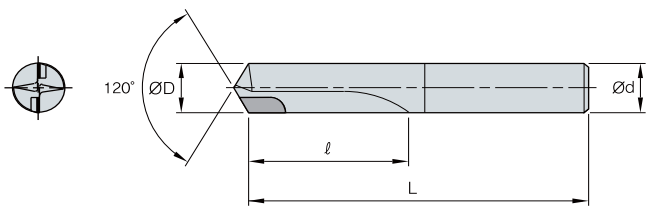
PDDA 04375 S

PCD Drill	Diameter	Type
	04375 : Ø0.4375	S : Solid Type B : Brazed Type

Recommended cutting condition

Workpiece	vc(sfm)	fn(lpr)
Aluminum alloy	165~820	D≤Ø0.3125:0.002~0.008 D≤Ø0.3125:0.004~0.016

PDD



(inch)

Designation		ØD	Ød	ℓ	L
PDDA	01875S	0.1875	0.1875	1.5	3.0
	02500S	0.2500	0.2500	1.5	3.5
	03125S	0.3125	0.3750	2.0	4.0
	03750S	0.3750	0.3750	2.0	4.5
	04375S	0.4375	0.5000	2.5	4.5
	05000B	0.5000	0.5000	2.5	5.0

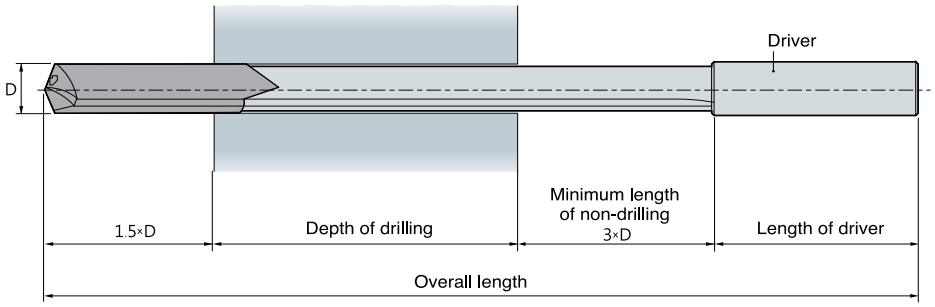
Stable performance and hole quality with our unique cutting edge and guide pad
Available regrinding

Gun Drill

- High efficiency in deep hole machining
- High accuracy (Hole tolerance : IT9, surface finish : Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, The drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

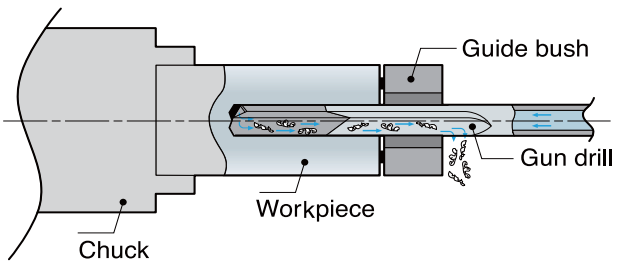
Code system

KGD	SA	0.250	– 0600	/ D30
KORLOY Gun Drill	Lib type S : Single T : Twin	Drill Dia. Ø0.250	Length of Drill 60.0inch	Drive No. D30



- Refer to the code system and the above drawing when ordering.
- Refer to the page 68 for the size of a driver.
- The overall length can be chosen by order.

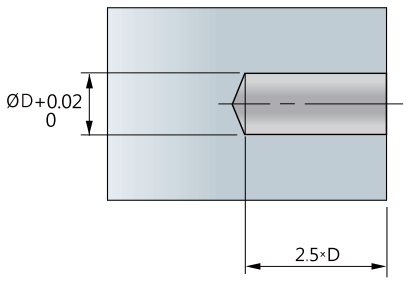
Application of Gun Drill on exclusive machine



- The guide bush is necessary for centering before gun-drilling.

Application of Gun Drill on machining center

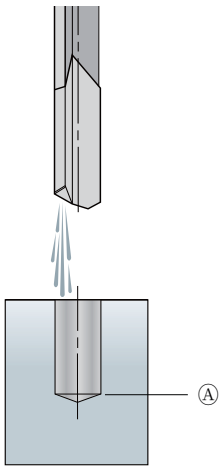
1 Machining of a pilot hole



1. A pilot hole is necessary in machining on a machining center instead of a guide bush.
2. The diameter of the pilot hole should be 0.004~0.008(H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 0.098×D.
3. Use Mach Drill(MSD) for machining of a pilot hole.

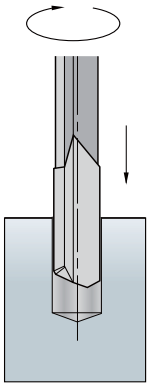
MSD

2 Moving the Gun Drill to the pilot hole



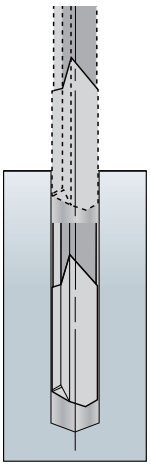
1. The Gun Drill should not drill before entering into the pilot hole.
2. Coolant is necessary for gun drilling.

3 Start Gun Drilling.



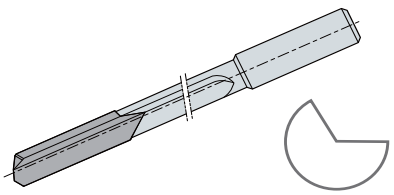
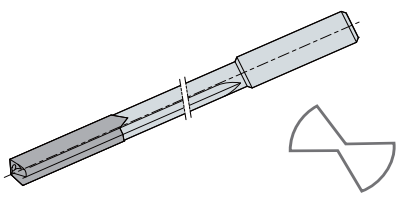
1. Rotate the spindle.
2. Machine with drilling to vertical axis.

4 After gun drilling



1. Return the drill.
2. Stop drilling and supplying coolant.
3. Remove the Gun Drill.

Features

	Single Lip type	Twin Lip type
Shape		
Drill Dia.	Ø0.079 ~ Ø1.299	Ø0.236 ~ Ø1.043
Depth of drilling	≥ 78.74inch	≥ 39.37inch
Tolerance	IT9	IT10
Surface finish	Ra 0.1 ~ 3.0μm	Ra 1.0 ~ 4.0μm
Application	For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's

Recommended cutting condition

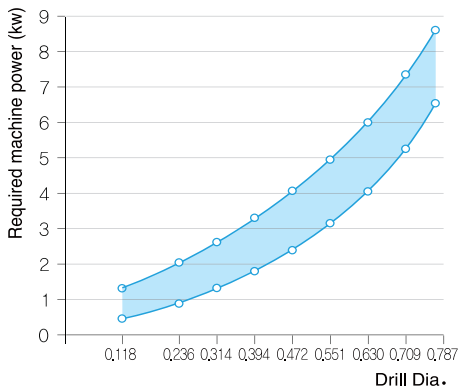
Workpiece	Hardness (HB)	Cutting speed vc(sfm)	Feed rate, fn(ipr)					
			~Ø0.156	Ø0.157~Ø0.235	Ø0.236~Ø0.412	Ø0.413~Ø0.550	Ø0.551~Ø0.944	Ø0.551~Ø0.944
Carbon steel Alloy steel	~150	330~490	0.0002~0.0006	0.0004~0.0010	0.0006~0.0014	0.0008~0.0020	0.0012~0.0028	0.0016~0.0031
	150~250	260~395	0.0002~0.0004	0.0006~0.0008	0.0006~0.0012	0.0008~0.0016	0.0012~0.0024	0.0012~0.0024
	250~350	165~330	0.0002~0.0004	0.0002~0.0004	0.0004~0.0008	0.0006~0.0012	0.0008~0.0016	0.0008~0.0016
	350~	~100	-	0.0002~0.0004	0.0002~0.0004	0.0004~0.0008	0.0008~0.0014	0.0008~0.0014
Stainless steel	~250	165~260	0.0002~0.0006	0.0004~0.0008	0.0004~0.0008	0.0004~0.0012	0.0008~0.0014	0.0008~0.0016
	250~350	130~165	-	0.0002~0.0006	0.0004~0.0006	0.0004~0.0008	0.0004~0.0008	0.0004~0.0008
Cast iron	~220	260~330	0.0004~0.0005	0.0008~0.0016	0.0012~0.0020	0.0016~0.0031	0.0031~0.0047	0.0004~0.0059
	220~	130~260	0.0002~0.0004	0.0002~0.0006	0.0004~0.0008	0.0006~0.0012	0.0008~0.0020	0.0010~0.0028
Aluminum alloy	-	590~820	0.0004~0.0008	0.0008~0.0016	0.0012~0.0024	0.0016~0.0031	0.0039~0.0071	0.0059~0.0079
Light alloy	-	395~655	0.0002~0.0004	0.0004~0.0008	0.0008~0.0010	0.0008~0.0012	0.0001~0.0016	0.0016~0.0024

Technical information

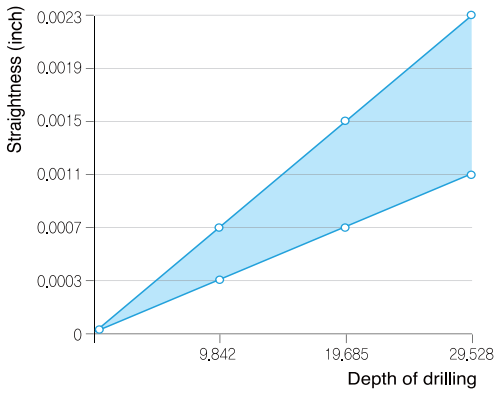
The factors below determines the straightness of hole.

- Drill diameter and depth of drilling
- Cutting condition and kind of application
- Kind of workpiece and machine
- Drill bush

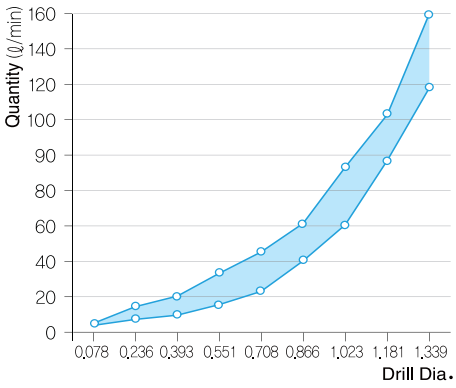
Required machine power



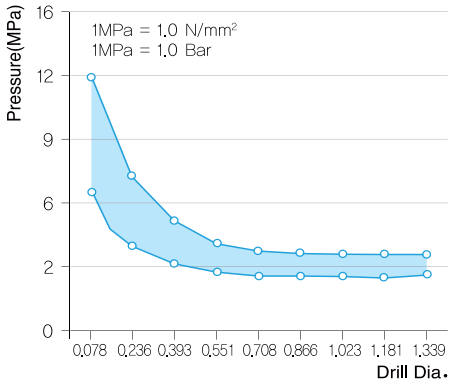
Straightness



Quantity of coolant



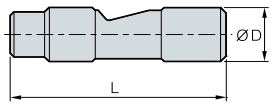
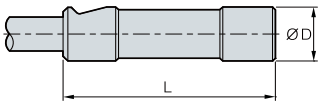
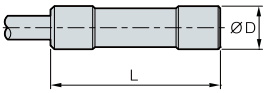
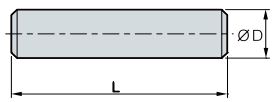
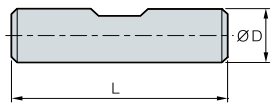
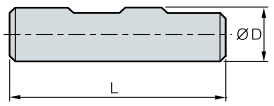
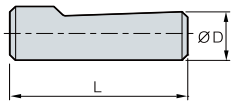
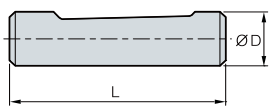
Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc.

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge.
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump.
- **Temperature of coolant** - Proper temperature of coolant : 20°C~ 22°C / Do not use coolant at 50°C above

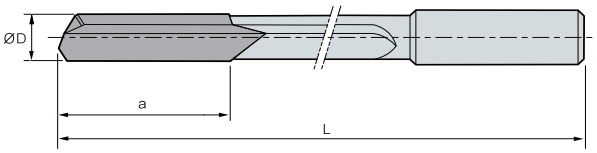
Driver standard

Type	Shape	No.	ØD×L		Carbide Type	
			ØD×L	Thread	Tipped	Solid
Central Clamping Surface 15°		D01	0.394 × 1.57		●	●
		D02	0.630 × 1.77		●	
		D03	0.750 × 2.75		●	
		D04	0.984 × 2.76		●	
		D05	1.000 × 2.75		●	
Frontal Clamping Surface 15°		D06	0.630 × 1.97		●	
Central Clamping Tapered		D07	0.500 × 1.50		●	●
		D08	0.630 × 2.76			
		D09	0.750 × 2.75		●	
		D10	0.787 × 2.76			
Cylindrical DIN1835A DIN6535HA		D11	0.157 × 1.10		●	●
		D12	0.236 × 1.42		●	●
		D13	0.394 × 1.57		●	●
		D14	0.630 × 1.89		●	●
		D15	0.787 × 1.97		●	
		D16	0.984 × 2.20		●	
Weldon DIN1835B		D17	0.394 × 1.57		●	●
		D18	0.472 × 1.77		●	●
		D19	0.630 × 1.89		●	●
		D20	0.787 × 1.97		●	●
Weldon DIN6535HB		D21	0.984 × 2.20		●	
		D22	1.260 × 2.36		●	
		D23	1.575 × 2.76			
Whistle Notch DIN1835E		D24	0.394 × 1.57		●	●
		D25	0.472 × 1.77		●	●
		D26	0.630 × 1.89		●	●
		D27	0.787 × 1.97		●	●
		D28	0.984 × 2.20		●	
		D29	1.260 × 2.36		●	
Whistle Notch DIN6535HE		D30	0.394 × 1.57		●	●
		D31	0.472 × 1.77		●	●
		D32	0.630 × 1.89		●	●
		D33	0.787 × 1.97		●	●

* Special types are available for quotation with shape and size information.

KGDS

Single Lip type



Designation discription	
○.○○	Diameter
□□□□	Length
D△△	Driver code no.

(inch)

Designation		ØD	L
KGDSA	O.OO-□□□□ / D△△	0.079~0.097	0.7
	O.OO-□□□□ / D△△	0.098~0.117	0.7
	O.OO-□□□□ / D△△	0.118~0.137	0.8
	O.OO-□□□□ / D△△	0.138~0.156	0.8
	O.OO-□□□□ / D△△	0.157~0.176	0.9
	O.OO-□□□□ / D△△	0.177~0.196	0.9
	O.OO-□□□□ / D△△	0.197~0.216	0.9
	O.OO-□□□□ / D△△	0.127~0.235	1.0
	O.OO-□□□□ / D△△	0.236~0.255	1.1
	O.OO-□□□□ / D△△	0.256~0.275	1.1
	O.OO-□□□□ / D△△	0.276~0.294	1.1
	O.OO-□□□□ / D△△	0.295~0.314	1.2
	O.OO-□□□□ / D△△	0.315~0.334	1.2
	O.OO-□□□□ / D△△	0.335~0.353	1.2
	O.OO-□□□□ / D△△	0.354~0.373	1.2
	O.OO-□□□□ / D△△	0.374~0.383	1.2
	O.OO-□□□□ / D△△	0.384~0.412	1.2
	O.OO-□□□□ / D△△	0.413~0.432	1.3
	O.OO-□□□□ / D△△	0.433~0.452	1.4
	O.OO-□□□□ / D△△	0.453~0.471	1.4
	O.OO-□□□□ / D△△	0.472~0.491	1.5
	O.OO-□□□□ / D△△	0.492~0.511	1.5
	O.OO-□□□□ / D△△	0.512~0.550	1.5
	O.OO-□□□□ / D△△	0.551~0.590	1.5
	O.OO-□□□□ / D△△	0.591~0.599	1.5
	O.OO-□□□□ / D△△	0.630~0.668	1.5
	O.OO-□□□□ / D△△	0.669~0.708	1.6
	O.OO-□□□□ / D△△	0.709~0.747	1.6
	O.OO-□□□□ / D△△	0.748~0.786	1.6
	O.OO-□□□□ / D△△	0.787~0.826	1.7
	O.OO-□□□□ / D△△	0.827~0.865	1.8
	O.OO-□□□□ / D△△	0.866~0.905	1.9
	O.OO-□□□□ / D△△	0.906~0.944	2.0
	O.OO-□□□□ / D△△	0.945~0.983	2.1
	O.OO-□□□□ / D△△	0.984~1.023	2.1
	O.OO-□□□□ / D△△	1.024~1.062	2.1
	O.OO-□□□□ / D△△	1.063~1.101	2.1
	O.OO-□□□□ / D△△	1.102~1.141	2.1
	O.OO-□□□□ / D△△	1.142~1.180	2.2
	O.OO-□□□□ / D△△	1.181~1.219	2.3
	O.OO-□□□□ / D△△	1.220~1.259	2.4
	O.OO-□□□□ / D△△	1.260~1.299	2.4

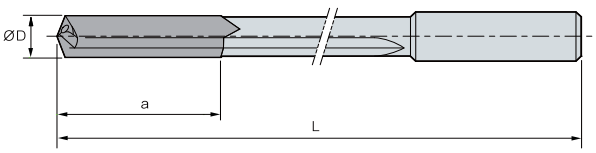
※ When ordering, please mark the overall length and driver number (or drawing).

Available overall length

Designation	Drill Dia.	Overall length				
		9.84	19.69	39.37	59.06	78.74
KGDS	0.079 ~ 0.117	○	○			
	0.118 ~ 0.137	○	○	○		
	0.138 ~ 1.299	○	○	○	○	○

KGDT

Twin Lip type



Designation discription	
O.OO	Diameter
□□□□	Length
D△△	Driver code no.

(inch)

Designation		ØD	a
KGDTA	O.OO-□□□□ / D△△	0.236~0.255	1.4
	O.OO-□□□□ / D△△	0.256~0.275	1.4
	O.OO-□□□□ / D△△	0.276~0.294	1.5
	O.OO-□□□□ / D△△	0.295~0.314	1.5
	O.OO-□□□□ / D△△	0.315~0.334	1.5
	O.OO-□□□□ / D△△	0.335~0.353	1.5
	O.OO-□□□□ / D△△	0.354~0.373	1.6
	O.OO-□□□□ / D△△	0.374~0.393	1.6
	O.OO-□□□□ / D△△	0.394~0.412	1.6
	O.OO-□□□□ / D△△	0.413~0.432	1.6
	O.OO-□□□□ / D△△	0.433~0.452	1.8
	O.OO-□□□□ / D△△	0.453~0.471	1.8
	O.OO-□□□□ / D△△	0.472~0.491	1.8
	O.OO-□□□□ / D△△	0.492~0.511	1.9
	O.OO-□□□□ / D△△	0.512~0.550	1.9
	O.OO-□□□□ / D△△	0.551~0.590	1.9
	O.OO-□□□□ / D△△	0.591~0.629	1.9
	O.OO-□□□□ / D△△	0.630~0.668	2.0
	O.OO-□□□□ / D△△	0.669~0.708	2.0
	O.OO-□□□□ / D△△	0.709~0.747	2.0
	O.OO-□□□□ / D△△	0.748~0.786	2.0
	O.OO-□□□□ / D△△	0.787~0.826	2.2
	O.OO-□□□□ / D△△	0.827~0.865	2.2
	O.OO-□□□□ / D△△	0.866~0.905	2.2
	O.OO-□□□□ / D△△	0.906~0.944	2.4
	O.OO-□□□□ / D△△	0.945~0.983	2.4
	O.OO-□□□□ / D△△	0.984~1.023	2.6
	O.OO-□□□□ / D△△	1.024~1.043	2.6

※ When ordering, please mark the overall length and driver number (or drawing).

Available overall length

Designation	Drill Dia.	Overall length				
		9.84	19.69	39.37	59.06	78.74
KGDT	0.236~1.043	○	○	○		

Mass production and High performance

Indexable Reamer

- Suitable for mass production and High performance
- Using PCD or coated insert for high speed machining
- Excellent high accuracy and adjustable machining hole
- Using accuracy chucking system(Hydraulic, rotating type arbor)
- Using inner coolant type machine to evacuate chips
- Using suitable holder and insert
- As insert setting , using setting fixture (KIRSD-210)

Code system

IR TA 0625 – 0750 60 – 16

Type	Application	Reamer Dia.	Shank Dia.	length	Insert size
Indexable Reamer	T : Throughout hole machining B : Blind hole machining	0625 : Ø0.625	0750 : Ø0.750	60 : 6.0	15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5

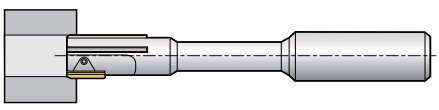
Insert code system

RI 15 – B 06

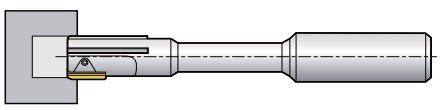
Type	Insert size	Insert reed type	Angle of C/B
Reamer Insert	15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5	A : Excellent surface finish, low cutting condition B : General surface finish, high cutting condition C : Aluminum and copper alloy D : Blind hole, low feed	00 : 0°, Cast iron 06 : 6°, General steel 12 : 12°, Stainless, Al

Application

Throughout hole machining(IRT type)

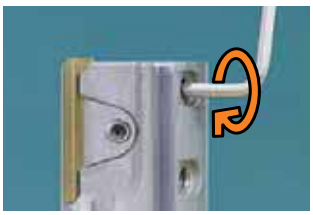


Stuffed hole machining (IRB type)



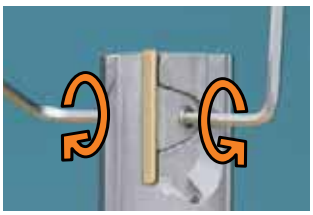
How to set an insert

1



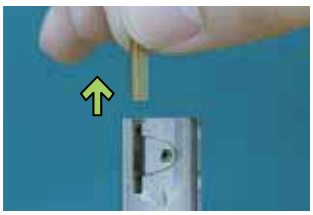
1. Screw the wedge screw counter clockwise with the exclusive wrench.

2



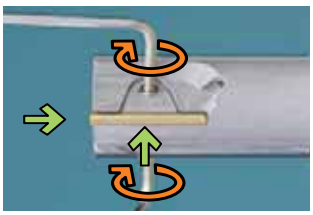
2. Screw the clamp screw.
   ① Top side : counter clockwise
   ② Lower side : clockwise

3



3. Remove the insert and clean the pocket.

4



4. Put the insert up to the edge stopper and clamp the insert.
   ① Top side : clockwise
   ② Lower side : counterclockwise

Exclusive fixture

- Designation : KIRSD-210
- Maximum diameter of reamer : Ø2.36×8.27inch
- The fixture is also available for setting special reamer and mono tool.
- Special reamers (out of maximum setting range) are available quotation.

How to set an insert with fixture

1

1. Adjust the gauge to '0'.

2

2. Rotate the reamer for the insert to touch the gauge.

3

3. Set the back taper and adjust the insert height with screw the wedge screw.
   ① Top side of insert : +0.0059 ~ +0.0078inch
   ② Bottom side of insert :+0.0019 ~ +0.0039inch
   ③ Back taper : 0.0039 ~ 0.0059inch

Back taper

- Ensures low cutting load and excellent surface finish with good chip evacuation.
- Inaccurate back taper could cause unstable machining with wear of insert.
- The size of back taper of insert down side should be less to 0.0039 ~ 0.0059inch than one of insert upper side.

Insert setting with a micrometer

• Lathe with both centers or Bench center are also available.

Notice : The setting with a micrometer is not recommended due to chipping on the cutting edge.

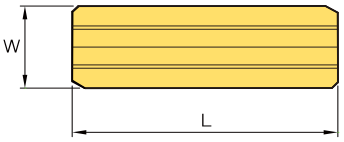
Recommended cutting condition

Workpiece	Insert Type		Feed rate, fn(ipr)	Cutting speed vc(sfm)		
	Rake angle	Leed type		Coated	Uncoated	Cermet
Carbon steel General steel	6	A	0.004~0.016	197~262	131~197	361~525
		B	0.004~0.012	262~394	197~262	
		D	0.002~0.008			
Mild steel Alloy steel	6	A	0.004~0.016	131~197	66~131	361~525
		B	0.004~0.012	262~394	197~262	
		D	0.002~0.008			
High alloy steel Tool steel	6	A	0.004~0.016	66~197	66~131	66~197
		B	0.004~0.012	131~262	131~197	131~262
		D	0.002~0.008			
Stainless steel	12	A	0.004~0.012	131~197	66~131	131~197
		B	0.004~0.008	197~262	66~131	197~262
		D	0.002~0.008			
Cast iron	0.6	A	0.004~0.012	197~328	131~197	
		B	0.004~0.010	262~394	197~262	
		D	0.002~0.008			
Alloyed aluminum	12	B	0.004~0.012		525~626	
		C	0.006~0.012		492~820	
		D	0.002~0.008		361~656	
Alloyed copper	0	B	0.004~0.008		262~328	
		D	0.002~0.008			
Non-ferrous alloy	0	B	0.004~0.012		33~230	

Parts

Reamer Size	Clamp	Wedge	Clamp Screw	Wedge Screw (NYLOK)	Clamp Wrench	Wedge Wrench
0.375	CV 15	AW2430	DHA0308	HSO306	HW15L	HW15L
0.500~0.625	CV 16	AW2435				
0.750~1.000	CV 17	AW3240	DHA0409	HS0406	HW20L	HW20L
1.125~1.250	CV 22	AW3260				

Indexable Reamer Insert

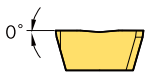
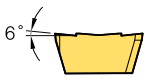
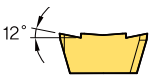


(inch)

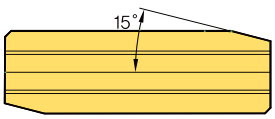
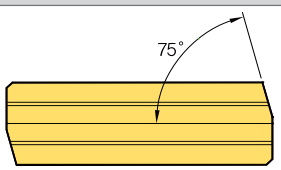
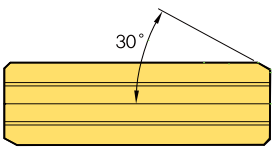
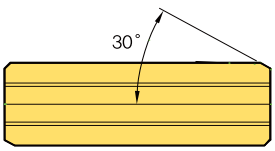
Designation		Grade			Dimensions			Reed type	Rake angle (α°)
		K10(Uncoated)	BPK110(TiAlN)	BPK210(TiN)	L	W	S		
RI	15-A06			○	0.591	0.118	0.059	A	6°
	15-A12	○			0.591	0.118	0.059	A	12°
	15-B06		○	○	0.591	0.118	0.059	B	6°
	15-B12		○		0.591	0.118	0.059	B	12°
	16-A06			○	0.630	0.138	0.059	A	6°
	16-A12	○			0.630	0.138	0.059	A	12°
	16-B06		○	○	0.630	0.138	0.059	B	6°
	16-B12		○		0.630	0.138	0.059	B	12°
	17-A06			○	0.669	0.177	0.079	A	6°
	17-A12	○			0.669	0.177	0.079	A	12°
	17-B06		○	○	0.669	0.177	0.079	B	6°
	17-B12		○		0.669	0.177	0.079	B	12°
	22-A06			○	0.866	0.256	0.118	A	6°
	22-A12	○			0.866	0.256	0.118	A	12°
	22-B06		○	○	0.866	0.256	0.118	B	6°
	22-B12		○		0.866	0.256	0.118	B	12°

※ ○ : This is recommended grade as for insert type

Angle of chip breaker

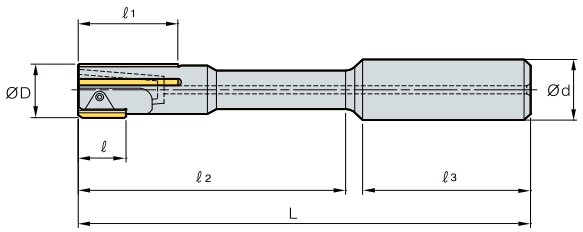
	00	06	12
Shape			
Application	For cast iron machining	For general machining	For stainless and aluminum machining

Insert lead type

Type	Shape	Working condition	Type	Shape	Working condition
A		For excellent surface, low cutting condition	C		For aluminum and copper alloy machining
B		For general application, high cutting condition	D		For blind hole machining, low feed

IRT

Throughout hole



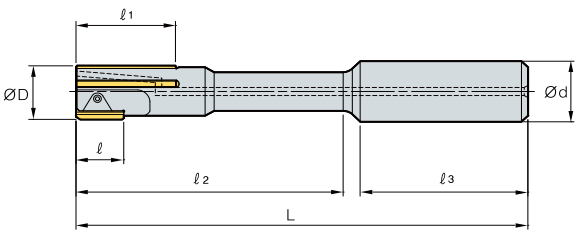
(inch)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRTA	0375-062550-15	0.375	0.591	1.2	3.0	1.8	5.0	0.625	RI 15
	0500-062553-16	0.500	0.630	1.2	3.3	1.8	5.5	0.625	RI 16
	0625-075061-16	0.625	0.630	1.2	4.0	4.0	6.0	0.750	RI 16
	0750-075061-17	0.750	0.669	1.2	4.0	4.0	6.0	0.750	RI 17
	0875-100065-17	0.875	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1000-100065-17	1.000	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1125-125065-22	1.125	0.816	1.2	4.3	4.3	6.5	1.250	RI 22
	1250-125065-22	1.250	0.816	1.2	4.3	4.3	6.5	1.250	RI 22

Applicable inserts **G82**

IRB

Stuffed hole



(inch)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRBA	0375-062550-15	0.375	0.591	1.2	3.0	1.8	5.0	0.625	RI 15
	0500-062553-16	0.500	0.630	1.2	3.3	1.8	5.5	0.625	RI 16
	0625-075061-16	0.625	0.630	1.2	4.0	4.0	6.0	0.750	RI 16
	0750-075061-17	0.750	0.669	1.2	4.0	4.0	6.0	0.750	RI 17
	0875-100065-17	0.875	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1000-100065-17	1.000	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1125-125065-22	1.125	0.816	1.2	4.3	4.3	6.5	1.250	RI 22
	1250-125065-22	1.250	0.816	1.2	4.3	4.3	6.5	1.250	RI 22

Applicable inserts **G82**

Chucking / Machine Reamer

Recommended cutting condition

(mm)

Workpiece	Hardness (HB)	Cutting condition	Diameter		
			~Ø9	Ø10~25	Ø26~60
Steel	~100kg/mm^2	vc(m/min)	8~12	8~12	8~12
		fn(mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	vc(m/min)	5~10	5~10	5~10
		fn(mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
Cast iron	HB ~220	vc(m/min)	6~12	6~12	8~15
		fn(mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	vc(m/min)	5~10	5~10	8~12
		fn(mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
Brass	HB 50~120	vc(m/min)	8~12	10~15	10~15
		fn(mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Bronze	HB 60~100	vc(m/min)	8~12	10~15	10~15
		fn(mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Alloyed aluminum	HB 90~120	vc(m/min)	15~25	15~25	20~30
		fn(mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
Synthetic resins	-	vc(m/min)	15~30	20~35	30~40
		fn(mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

M This is metric size. We can also provide in inch type

Chucking Reamer - SCRS

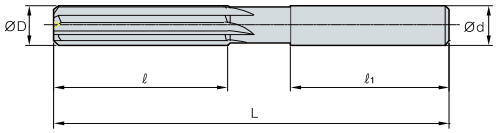


Fig.1

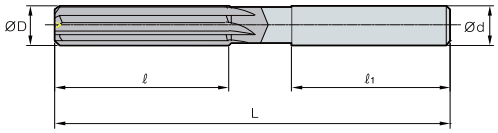


Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

M This is metric size. We can also provide in inch type

Chucking Reamer - SCRH

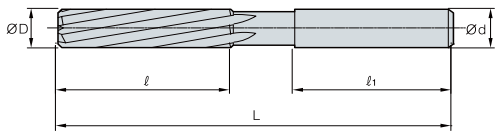


Fig. 1

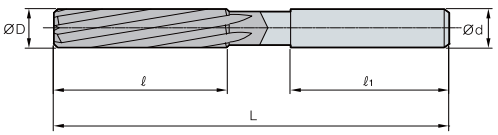


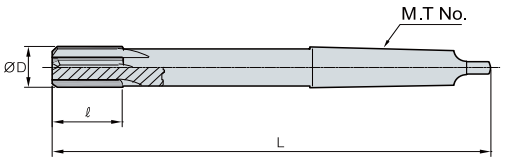
Fig. 2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRH	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

M This is metric size. We can also provide in inch type

Chucking Reamer - TCRS

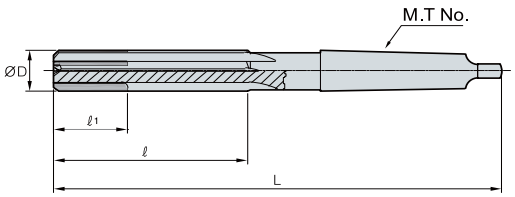


(mm)

Designation		No. of flute	ØD	ℓ	L	M.T No.
TCRS	070	4	7.0	20	150	1
	080	4	8.0	20	150	1
	090	4	9.0	20	160	1
	100	4	10.0	25	160	1
	110	4	11.0	25	170	1
	120	4	12.0	25	170	1
	130	4	13.0	25	180	1
	140	6	14.0	25	190	1
	150	6	15.0	30	200	2
	160	6	16.0	30	200	2
	180	6	18.0	30	220	2
	200	6	20.0	40	230	2
	250	6	25.0	40	260	3
	280	8	28.0	40	270	3
	300	8	30.0	50	290	3

M This is metric size. We can also provide in inch type

Machine Reamer - TMRS



(mm)

Designation		No. of flute	ØD	ℓ	ℓ_1	L	M.T No.
TMRS	070	4	7.0	60	60	150	1
	080	4	8.0	70	70	150	1
	090	4	9.0	70	70	160	1
	100	4	10.0	75	75	170	1
	110	4	11.0	75	75	170	1
	120	4	12.0	80	40	180	1
	130	4	13.0	85	40	190	1
	140	6	14.0	90	45	210	1
	150	6	15.0	90	45	215	2
	160	6	16.0	100	50	220	2
	180	6	18.0	105	50	225	2
	200	6	20.0	120	50	240	2
	250	6	25.0	130	50	270	3
	280	8	28.0	140	50	280	3
	300	8	30.0	150	50	290	3

M This is metric size. We can also provide in inch type

PCD Reamer

Code system

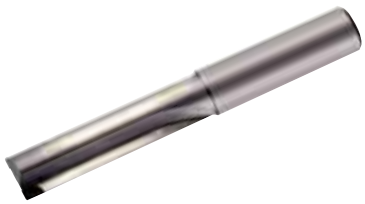
PDRA 2 03750

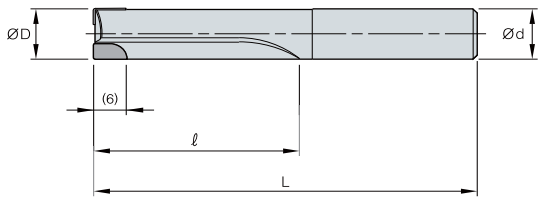
Type	Tooth	Diameter
PCD Reamer	2 : 2flute	03750 : Ø0.3750

Recommended cutting condition (For high speed and high precision machining)

Workpiece	vc(sfm)	fn(ipr)
Aluminum alloy	165~820	0.002~0.008

PDR





(inch)

Designation		No. of flute	ØD	Ød	ℓ	L
PDRA	202187	2	0.2187	0.2500	1.5	3.0
	202500	2	0.2500	0.2500	1.5	3.0
	203125	2	0.3125	0.3750	1.5	3.0
	203750	2	0.3750	0.3750	1.5	3.5
	205000	2	0.5000	0.5000	2.0	4.0
	205625	2	0.5625	0.6250	2.0	4.0
	406250	4	0.6250	0.6250	2.0	4.0
	406875	4	0.6875	0.7500	2.5	4.5
	407500	4	0.7500	0.7500	2.5	4.5

BRAZED TOOLS

H

BRAZED TOOLS

KORLOY Ultra-Fine Grades "F-Series"

Features

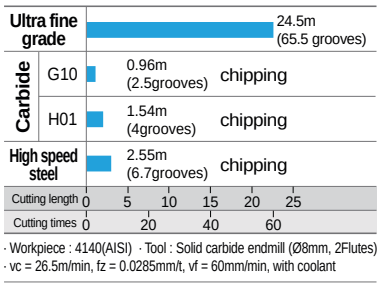
In general, when we compare cemented carbide to high speed steel, cemented carbide has higher hardness but is more brittle than high speed steel. To neutralize the difference, KORLOY has developed an ultra fine cemented carbide grade "F-Series"±(WC size under 0.5㎛). It provides improved toughness and plastic deformation resistance against cemented carbide having coarse grain sizes. The main coverage for ultra fine cemented carbide is endmilling of difficult-to-cut materials like high temp alloys.

● Micro Structure of "F-Series"

FA1	FCC	FS1
		
Since it is a grade focused on toughness, it is possible to make endmill, side cutter, gun drill, reamer etc. It has superior quality on toughness and anti built-up edge properties.	It has been modified from FA1 to increase thermal shock resistance, thus FCC has proper properties to machine stainless steel and hard to machine materials at medium to high speed milling.	As a ultra fine grade having high hardness and superior toughness at the same time, it is the 1st recommended grade of KORLOY to make sharp cutting edge to cut difficult-to-cut material.

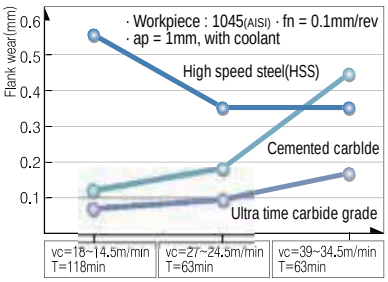
Cutting Performance

● Chipping Resistance



· Workpiece : 4140(AISI) · Tool : Solid carbide endmill (Ø8mm, 2Flutes)
· vc = 26.5m/min, fz = 0.0285mm/t, vf = 60mm/min, with coolant

● Wear resistance



AISI : American Iron and Steel Institute

● Special Features

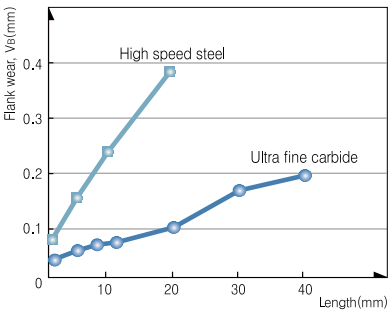
Grade	Characteristics			ISO classification	Wear resistance	Toughness
	Specific Gravity	Hardness (HRA)	TRS (kgf/mm²)			
FS1	14.4	92.4	250	Z10	⊙	○
FCC	12.6	91.5	250	Z10	⊙	○
FA1	14.1	91.2	300	Z20	○	⊙
FG2	14.3	92.7	350	Z10	⊙	○

Guide of Grade Selection

Workpiece	Non-ferrous metal Steel, Cast iron
1st Recommended Grade	FS1, FG2, FCC, FA1
Application tool	Drill, Endmill

● Cutting condition

- Workpiece : SM55C(HRC20)
- Helix angle : 30°
- Tool : Ø10mm, 2 Flutes(SSE2100)
- RPM = 1,100min^{-1}
- Cutting speed = 35m/mim
- Axial depth = 12mm
- Feed = 0.1mm/t
- Radial depth = 1mm
- Downward cutting, Without coolant



KORLOY Corrosion & Magnetism Proof Grades, "IN-Series"

Features

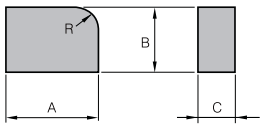
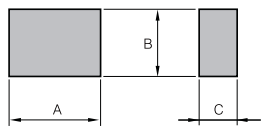
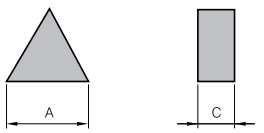
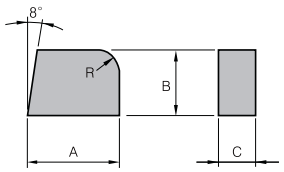
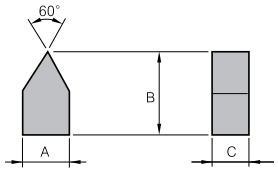
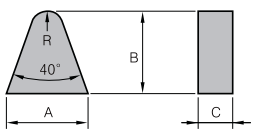
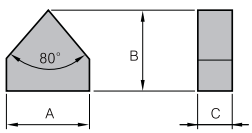
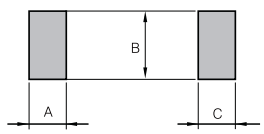
▶ Outstanding corrosion resistance : several hundred times better performance than general carbide grade.
(Test have been performed at 30% NHO3, comparing KORLOY G5 and IN-Series)
▶ Excellent hardness & toughness : Over (HRA) 85 hardness, Over (TRS) 200 toughness.
▶ Several grades : 3 different kind of grades for specific application, respectively.

Grade	Specific gravity (g/cm³)	Hardness (HRA)	TRS (kgf/mm²)	Magnetic saturation (Gauss·cm³/g)	Use
IN10	14.4	91.5	230	0	Mechanical Seal, Sliter Knife Anti-corrosive alloy, Magnetism proof alloy.
IN20	14.5	91.0	250	90	Mechanical Seal, Sliter Knife Anti-corrosive alloy.
IN40	13.5	85.5	280	0	Mold for magnetic powder. Anticorrosive-Magnetism proof alloy.

● Use

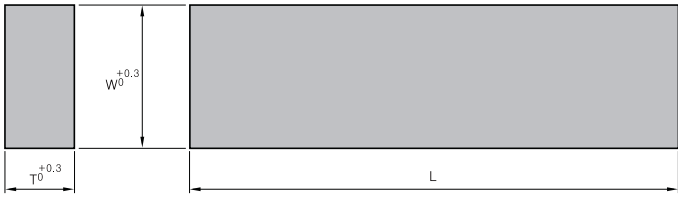
For Anti-corrosive	For Magnetism proof
• Parts for plant of corrosion-high pressure. • Parts for sea water pump. • Die / punch in high temperature. • Mechanical seal.	• Tape sliter. • Mold for magnetic powder. • Parts for VTR.

M This is metric size. We can also provide in inch type

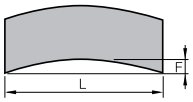
Inserts	Designation	A	B	C	R	Uncoated							Cermet		Available blank
						ST10	ST20	A40	GR35	U20	H02	H01	G10	CT10	CN20	
	01- 0	10	6	3	4											31 Type 32 Type 45 Type 46 Type
	1	13	9	3	5											
	2	16	11	4	5		●									
	3	19	13	5	5		●									
	4	22	15	6	8											
	5	25	17	7	8											
	6	30	20	8	8											
	02- 0	10	6	3	-		●			●		●	●			41 Type 42 Type
	1	13	9	3	-		●			●		●	●			
	2	16	11	4	-		●			●		●	●			
	3	19	13	5	-	●	●			●		●	●			
	4	22	15	6	-		●			●		●	●			
	5	25	17	7	-		●					●	●			
	6	30	20	8	-		●									
	03- 0	10	-	3	-											37 Type 38 Type 47 Type 48 Type
	1	12	-	3	-											
	2	15	-	4	-											
	3	18	-	5	-											
	4	24	-	6	-											
	5	24	-	7	-											
	6	28	-	8	-											
	04- 0	10	6	3	4											33 Type 34 Type
	1	13	9	3	5		●									
	2	16	11	4	5											
	3	19	13	5	5		●									
	4	22	15	6	8											
	5	25	17	7	8											
	6	30	20	8	8											
	05- 1	5	8	3	-		●			●						49 Type 50 Type 51 Type 52 Type
	2	6	10	4	-		●			●						
	3	7	12	5	-		●			●						
	4	9	16	6	-		●									
	5	10	18	7	-											
	6	11	20	8	-											
	06- 0	10	10	3	2		●			●		●				36 Type 39 Type 40 Type
	1	13	13	3	2.5		●			●		●	●			
	2	16	16	4	3	●	●			●		●	●			
	3	19	19	5	4		●		●	●	●	●	●			
	4	22	22	6	4	●	●			●		●	●			
	5	25	25	7	5		●			●		●	●			
	6	30	30	8	6											
	07- 0	10	10	3	-											35 Type
	1	13	13	3	-											
	2	16	16	4	-											
	3	19	19	5	-											
	4	25	20	6	-											
	5	25	22	7	-											
	6	30	25	8	-											
	08- 1	3	8	3	-		●			●						43 Type
	3	4	13	4	-	●	●			●		●	●			
	4	5	15	5	-	●	●			●		●	●			
	5	6	17	6	-	●	●			●			●			
	6	8	20	8	-		●									

M This is metric size. We can also provide in inch type

RB



■ Bending Tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code System RB 15 04 □

15 Length, 04 Width, □ Thickness

(mm)

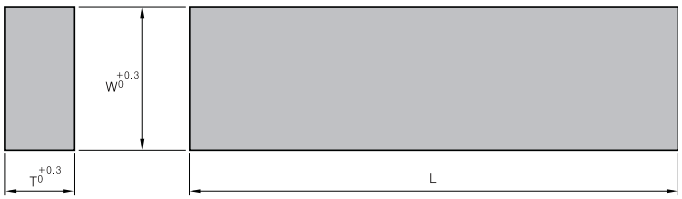
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	303□	3	3									
	304□	3	4									
	305□	3	5									
	306□	3	6									
	307□	3	7									
	308□	3	8									
	309□	3	9									
	310□	3	10									
RB	403□	4	3									
	404□	4	4									
	405□	4	5									
	406□	4	6									
	407□	4	7									
	408□	4	8									
	409□	4	9									
	410□	4	10									
RB	503□	5	3									
	504□	5	4									
	505□	5	5									
	506□	5	6									
	507□	5	7									
	508□	5	8									
	509□	5	9									
	510□	5	10									
RB	603□	6	3									
	604□	6	4									
	605□	6	5									
	606□	6	6									
	607□	6	7									
	608□	6	8									
	609□	6	9									
	610□	6	10									
RB	703□	7	3									
	704□	7	4									
	705□	7	5									

(mm)

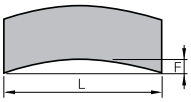
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	706□	7	6									
	707□	7	7									
	708□	7	8									
	709□	7	9									
	710□	7	10									
RB	803□	8	3									
	804□	8	4									
	805□	8	5									
	806□	8	6									
	807□	8	7									
	808□	8	8									
	809□	8	9									
	810□	8	10									
RB	903□	9	3									
	904□	9	4									
	905□	9	5									
	906□	9	6									
	907□	9	7									
	908□	9	8									
	909□	9	9									
	910□	9	10									
RB	1003□	10	3									
	1004□	10	4									
	1005□	10	5									
	1006□	10	6									
	1007□	10	7									
	1008□	10	8									
	1009□	10	9									
	1010□	10	10									
RB	1504□	15	4									
	1505□	15	5									
RB	2003□	20	3									
	2004□	20	4									
	2005□	20	5									
	2006□	20	6									

M This is metric size. We can also provide in inch type

RB



■ Bending Tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code System RB 15 04 □

Length Width Thickness

(mm)

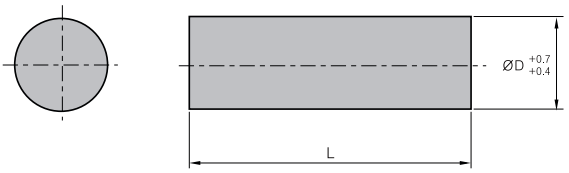
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	2007□	20	7									
	2008□	20	8									
	2009□	20	9									
	2010□	20	10									
RB	3003□	30	3									
	3004□	30	4									
	3005□	30	5									
	3006□	30	6									
	3007□	30	7									
	3008□	30	8									
	3009□	30	9									
	3010□	30	10									
RB	4003□	40	3									
	4004□	40	4									
	4005□	40	5									
	4006□	40	6									
	4007□	40	7									
	4008□	40	8									
	4009□	40	9									
	4010□	40	10									
RB	5003□	50	3									
	5004□	50	4									
	5005□	50	5									
	5006□	50	6									
	5007□	50	7									
	5008□	50	8									
	5009□	50	9									
	5010□	50	10									
RB	6003□	60	3									
	6004□	60	4									
	6005□	60	5									
	6006□	60	6									
	6007□	60	7									
	6008□	60	8									
	6009□	60	9									

(mm)

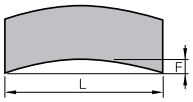
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	6010□	60	10									
RB	7003□	70	3									
	7004□	70	4									
	7005□	70	5									
	7006□	70	6									
	7007□	70	7									
	7008□	70	8									
	7009□	70	9									
	7010□	70	10									
RB	8003□	80	3									
	8004□	80	4									
	8005□	80	5									
	8006□	80	6									
	8007□	80	7									
	8008□	80	8									
	8009□	80	9									
	8010□	80	10									
RB	9003□	90	3									
	9004□	90	4									
	9005□	90	5									
	9006□	90	6									
	9007□	90	7									
	9008□	90	8									
	9009□	90	9									
	9010□	90	10									
RB	10003□	100	3									
	10004□	100	4									
	10005□	100	5									
	10006□	100	6									
	10007□	100	7									
	10008□	100	8									
	10009□	100	9									
	10010□	100	10									

M This is metric size. We can also provide in inch type

SR Round bars blank



■ Bending Tolerance



L		F-max
Standard	Tolerance	
~30	+1.5 - 0	0.10
31~40	+1.5 - 0	0.15
41~50	+1.5 - 0	0.20
51~100	+2.5 - 0	0.25

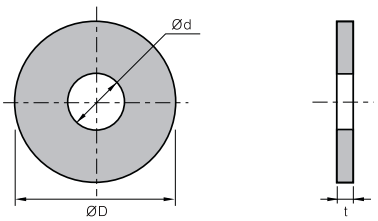
※ Code System SR 03 □
Diamerer Length

(mm)

Designation		ØD	T = □							Fig	
			30	40	50	60	70	80	90	100	ST20	G10
SR	03□	3										
	04□	4										
	05□	5										
	06□	6										
	07□	7										
	08□	8										
	09□	9										
	10□	10										
	11□	11										
	12□	12										

M This is metric size. We can also provide in inch type

RT Ring blank

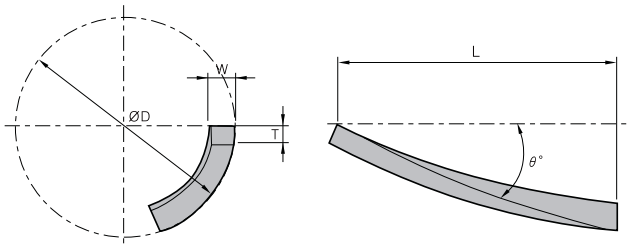


(mm)

Designation	ØD	Ød	t
ØD×Ød×t	Ø7.2~Ø200	Ø2.7~Ø150	0.8 ~10

M This is metric size. We can also provide in inch type

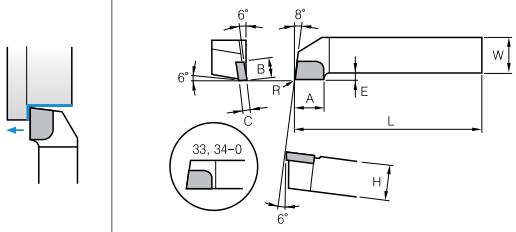
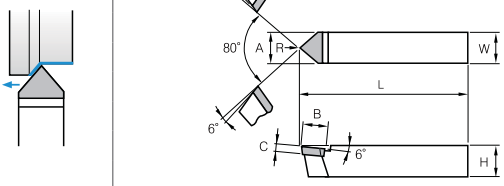
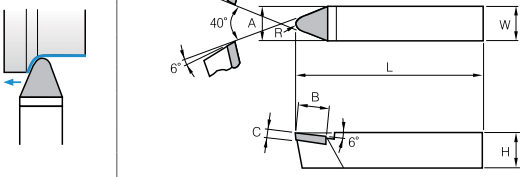
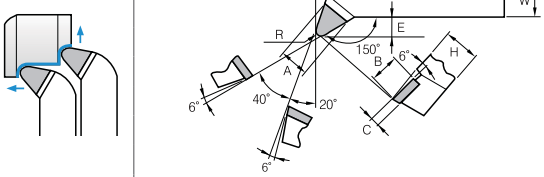
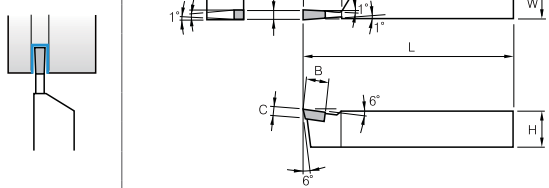
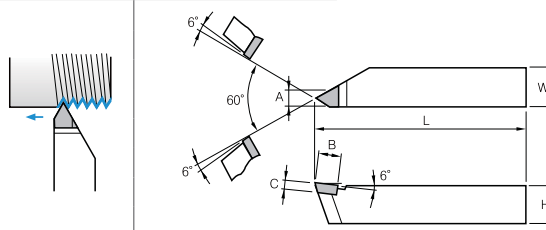
ST Helix blank



(mm)

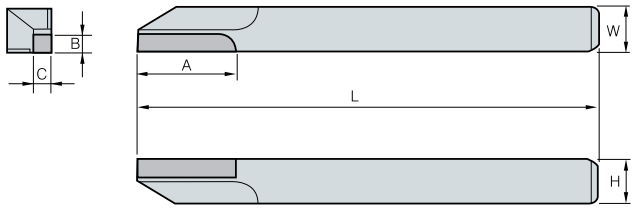
Designation		Available Endmill (ØD)	L	T	W	θ°
ST	**14**	Ø13, 14	30	2.3	4.0	23° 44′
	15	Ø15	30	2.3	4.0	25° 13′
	18	Ø18	32	2.3	4.5	25° 13′
	20	Ø20	32	2.8	5.5	24° 09′
	24	Ø23, 24	37	2.8	5.5	25° 13′
	26	Ø26, 27	37	3.3	6.5	24° 24′
	30	Ø29, 30, 31	42	3.8	7.0	25° 13′
	32	Ø32, 33	47	3.8	7.0	26° 41′
	35	Ø34, 35, 36	52	3.8	7.0	24° 36′
	38	Ø37, 38	57	3.8	7.0	23° 51′
	40	Ø39, 40, 41, 42	62	4.3	7.5	24° 57′
	45	Ø43, 44, 45, 46, 47	67	4.3	7.5	25° 13′
	50	Ø48, 49, 50	67	4.3	7.5	24° 09′

M This is metric size. We can also provide in inch type

Feed direction	Figure	Designation	A	B	C	(R)	W	H	L	E	F	Available blank
33Type(Right hand) / 34Type(Left hand)		33, 34 - 0	10	6	3	0.3	10	10	80	0		04-0
		1	13	9	3	0.5	13	13	100	4		04-1
		2	16	11	4	0.5	16	16	120	4		04-2
		3	19	13	5	0.5	19	19	140	5		04-3
		4	22	15	6	1	25	25	160	5		04-4
		5	25	17	7	1	25	30	180	5		04-5
		6	30	20	8	1	35	35	200	6		04-6
35Type		35 - 0	10	10	3	0.3	10	10	80			07-0
		1	13	13	3	0.5	13	13	100			07-1
		2	16	16	4	0.5	16	16	120			07-2
		3	18	19	5	0.5	19	19	140			07-3
		4	25	20	6	1	25	25	160			07-4
		5	25	22	7	1	25	30	180			07-5
		6	30	25	8	1	30	35	200			07-6
36Type		36 - 0	10	10	3	2	10	10	80			06-0
		1	13	13	3	2.5	13	13	100			06-1
		2	16	16	4	3	16	16	120			06-2
		3	18	18	5	4	19	19	140			06-3
		4	22	22	6	4	25	25	160			06-4
		5	25	25	7	5	25	30	180			06-5
		6	30	30	8	6	30	35	200			06-6
39Type(Right hand) / 40Type(Left hand)		39, 40 - 0	10	10	3	2	10	10	80	5		06-0
		1	13	13	3	2.5	13	13	100	7		06-1
		2	16	16	4	3	16	16	120	10		06-2
		3	19	19	5	4	19	19	140	12		06-3
		4	22	22	6	4	25	25	160	13		06-4
		5	25	25	7	5	25	30	180	15		06-5
		6	30	30	8	6	30	35	200	16		06-6
43Type		43 - 1	3	8	3		10	16	100		13	08-1
		2	3	8	3		13	19	120		16	08-1
		3	4	13	4		16	22	140		20	08-3
		4	5	15	5		18	25	160		25	08-4
		5	6	17	6		22	32	180		30	08-5
		6	8	20	8		25	38	200		40	08-6
49Type(Right hand) / 50Type(Left hand)		49, 50 - 1	5	8	3		13	13	100			05-1
		2	6	10	4		16	16	120			05-2
		3	7	12	5		19	19	140			05-3
		4	9	16	6		25	25	160			05-4

M This is metric size. We can also provide in inch type

PBX100



(mm)

Designation		A	B	C	W	H	L
PBX -	**105**	20	2.0	2.0	5	5	125
	106	20	2.5	2.5	6	6	140
	107	20	3.0	3.0	7	7	150
	108	20	3.0	3.0	8	8	150
	109	20	3.5	3.5	9	9	150
	110	20	4.0	4.0	10	10	150
	112	20	4.0	4.0	12	12	150
	116	20	4.0	4.0	16	16	150

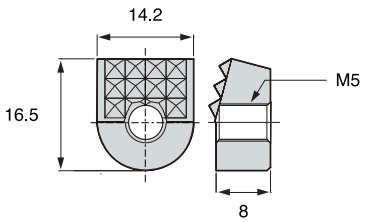
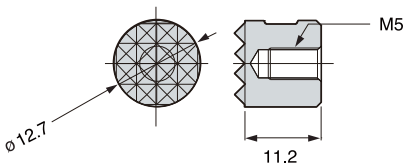
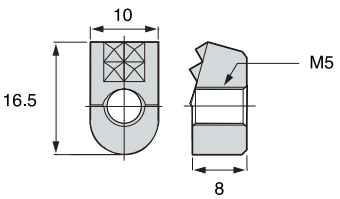
M This is metric size. We can also provide in inch type

Chuck Jaw

Features

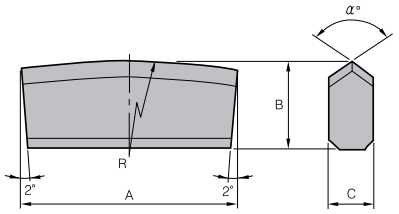
- Chuck Jaw strongly clamps rough workpiece in turning and milling (including MCT)
- Can chuck any types of workpiece

Stock information

Designation	Geometry	Dimension
CJ 04		
CJ 12		
CJ 21		
CJ 22		
CJ 23		
CJ 31		
CJ 32		
CJ 41		
CJ 42		

M This is metric size. We can also provide in inch type

For taper bits (1000Type)

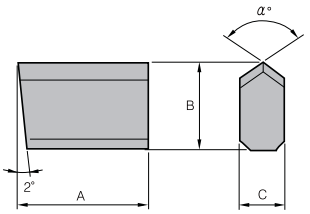


(mm)

Designation		A	B	C	α°	R
1000 -	**124**	24	10	6	100	80
	126	26	10	6	100	80
	128	28	10	6	100	80
	130	30	10	6	100	80
	132	32	10	6	100	80
	232	32	10	6	100	80
	234	34	12	8	110	120
	236	36	12	8	110	120
	238	38	12	8	110	120
	240	40	12	8	110	120
	242	42	12	8	110	120
	332	32	14	8	110	120
	334	34	14	8	110	120
	336	36	14	8	110	120
	338	38	14	8	110	120
	340	40	14	8	110	120
	342	42	14	8	110	120
	434	34	15	10	110	120
	436	36	15	10	110	120
	438	38	15	10	110	120
	440	40	15	10	110	120
	442	42	15	10	110	120
	444	44	15	10	110	120
	446	46	15	10	110	120
	534	34	18	10	110	120
	536	36	18	10	110	120
	538	38	18	10	110	120
	540	40	18	10	110	120
	542	42	18	10	110	120
	544	44	18	10	110	120
	546	46	18	10	110	120

M This is metric size. We can also provide in inch type

For cross bits (2000Type)



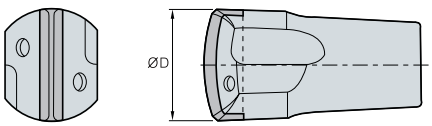
(mm)

Designation		A	B	C	α°	R
2000 -	**110**	10	10	6	100	
	111	11	10	6	100	
	112	12	10	6	100	
	113	13	10	6	100	
	114	14	10	6	100	
	115	15	12	6	100	
	210	10	12	6	100	
	211	11	12	6	100	
	212	12	12	6	100	
	213	13	12	6	100	
	214	14	12	6	100	
	215	15	14	8	100	
	312	12	14	8	100	
	313	13	14	8	100	
	314	14	14	8	100	
	315	15	14	8	100	
	316	16	14	8	100	
	317	17	14	8	100	
	318	18	14	8	100	

When ordering special items, Please point out the designation, grades, quantity. Available for tailor made.

M This is metric size. We can also provide in inch type

TB For taper bits

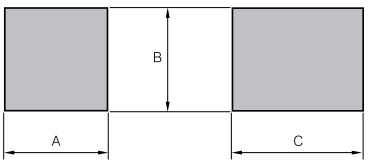


(mm)

Designation		ØD
TB	**20**	20
	32	32
	34	34
	36	36
	38	38
	39	39
	40	40

M This is metric size. We can also provide in inch type

BT Boring Crown Blank

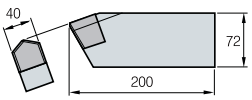


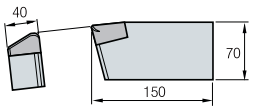
(mm)

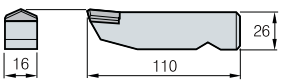
Designation		A	B	C
BT	**1**	5	5	8
	2	6	6	9
	3	8	8	10
	4	7	10	15

M This is metric size. We can also provide in inch type

Bits for construction

Configuration	Dimensions
Earth Auger Bits	

Configuration	Dimensions
Casing Bits	

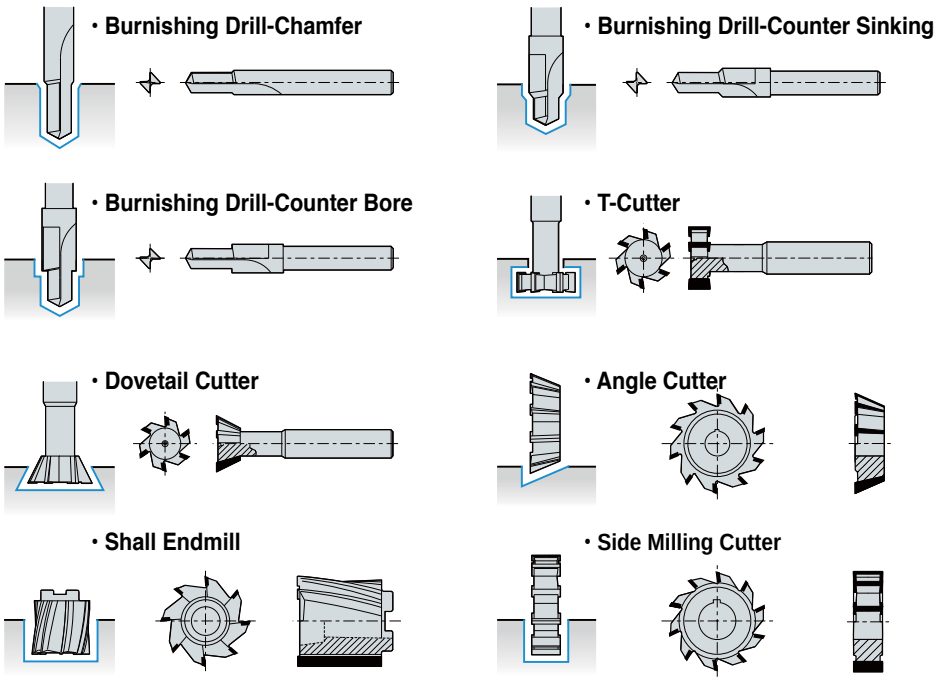
Configuration	Dimensions
Rod Bits	

M This is metric size. We can also provide in inch type

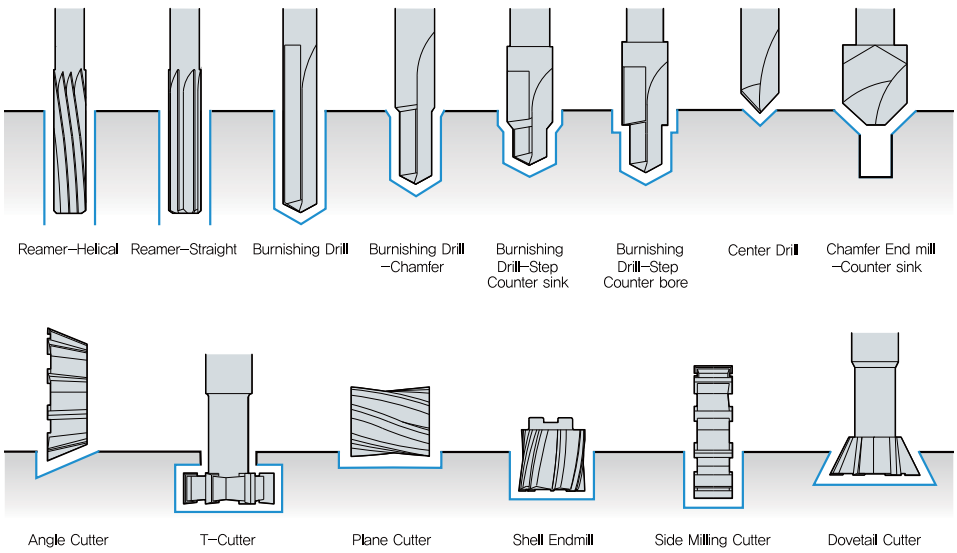
Features

- For various applications
- Precise accuracy. Easy to order for special types.
- Suitable for small tools. Short delivery time.
- Reasonable tool cost. Reusable after sharpening.

Cutting Process Type

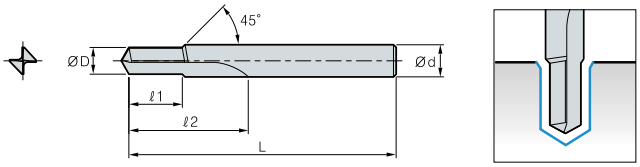


Cutting Processes and Types



M This is metric size. We can also provide in inch type

Burnishing Drill-Chamfer

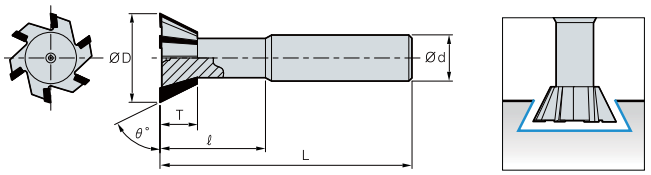


(mm)

Designation	ØD	ℓ1	ℓ2	L	Ød
BDC					

M This is metric size. We can also provide in inch type

Dovetail Cutter

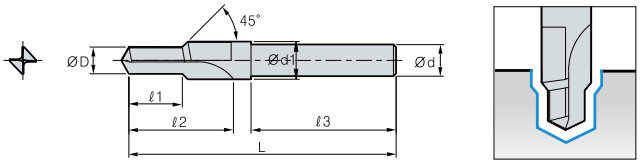


(mm)

Designation	ØD	ℓ	θ°	ℓ1	L	Ød	No. of Flute
DC							

M This is metric size. We can also provide in inch type

Burnishing Drill-Step

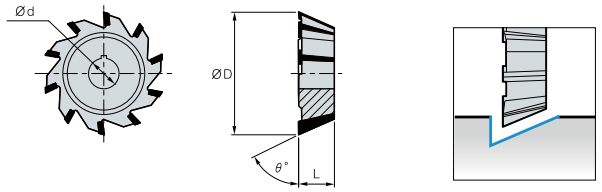


(mm)

Designation	ØD	Ød1	ℓ1	ℓ2	ℓ3	L	Ød
BDS							

M This is metric size. We can also provide in inch type

Angle Cutter

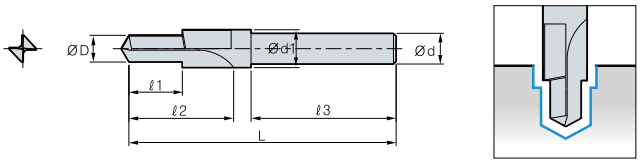


(mm)

Designation	ØD	θ°	Ød	L	No. of Flute
AC					

M This is metric size. We can also provide in inch type

Burnishing Drill-Counter Bore

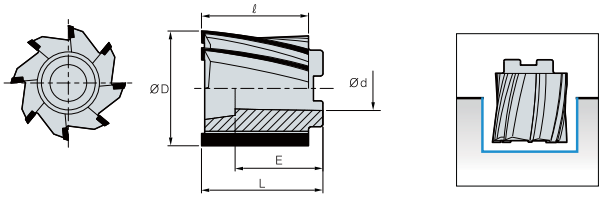


(mm)

Designation	ØD	Ød2	ℓ1	ℓ2	ℓ3	L	Ød
BDCB							

M This is metric size. We can also provide in inch type

Shall Endmill

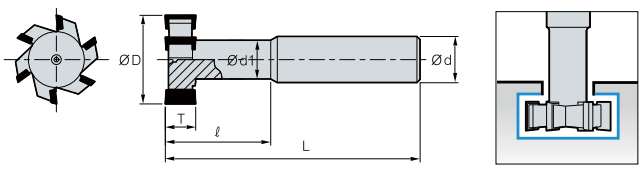


(mm)

Designation	ØD	Ød	ℓ	E	L	No. of Flute
SEM						

M This is metric size. We can also provide in inch type

T-Cutter

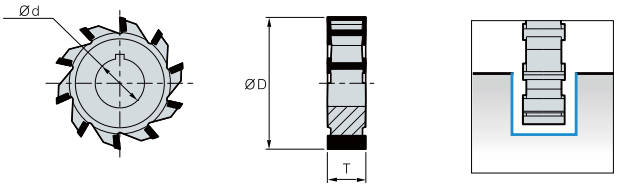


(mm)

Designation	ØD	Ød1	T	ℓ	L	Ød	No. of Flute
TC							

M This is metric size. We can also provide in inch type

Side Milling Cutter



(mm)

Designation	ØD	Ød	T	No. of Flute
SMC				

M This is metric size. We can also provide in inch type

TOOLING SYSTEM

TOOLING SYSTEM

For high speed machining

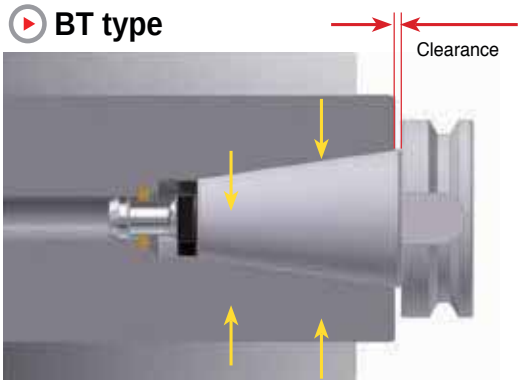
DBT Series

2 face constrained system of taper and shank face for excellent surface roughness and high quality finish in heavy cutting at high speed

Features of 2 face constrained system

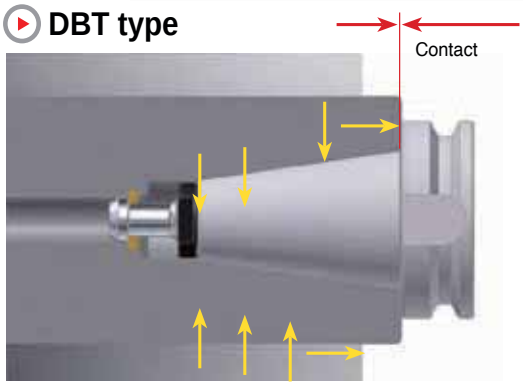
- Stable machining can be possible at high speed
- Improvement of tool-life for machine spindle and cutting tool
- Prevention for corrosion of taper porsion of both machine spindle and tool holder by heavy duty machining vibration
- Guarantee for the most suitable machining and high accuracy

BT type



The clearance between spindle and face of shank

DBT type

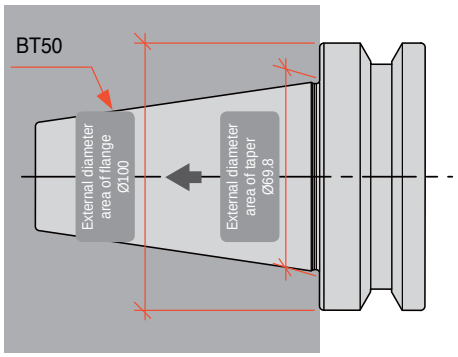


Perfect contact of both faces
Better precision / less vibration

Higher stability and precision

Stability and precision increase due to the close contact between taper face and wide external diameter of flange at DBT shank than at BT shank

Shank	Taper		Flange
BT30	Ø31.7	→	Ø46
BT40	Ø44.4	→	Ø63
BT50	Ø69.8	→	Ø100



Difference between taper face contact and flange contact at its external diameter

Various models

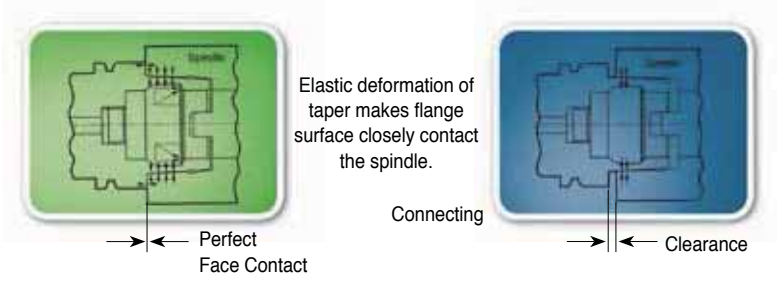
Drilling/Endmilling		Milling		Face Milling	Angular Head
					
DBT-SDC	DBT-HPS	DBT-NPM	DBT-DHE	DBT-FMA	DBT-KAG

M This is metric size. We can also provide in inch type

HSK Tooling System

HSK 2 Face Constrained Toolholder

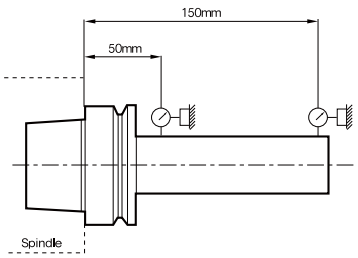
The 7/24 taper shank for multi-purpose has been pointed out that its performance is inappropriate in terms of repeatability, joint stiffness and high speed machining.
Drawbacks of 7/24 taper shank had been eliminated by using new two face contact.

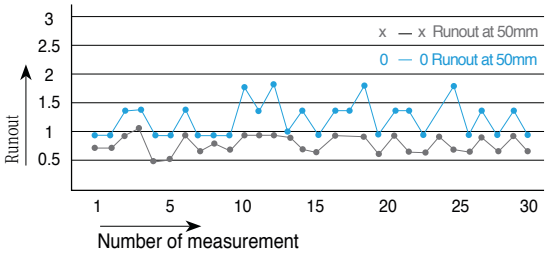


HSK shank -Perfect 2-surface constrained System

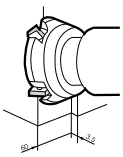
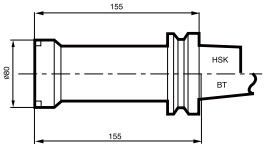
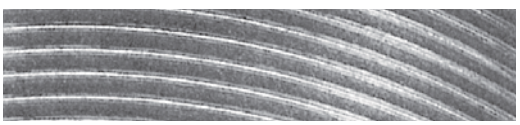
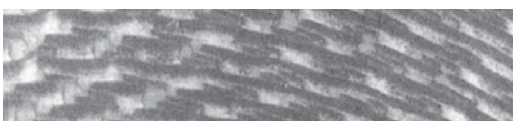
Excellent Repeatability-Run out Accuracy

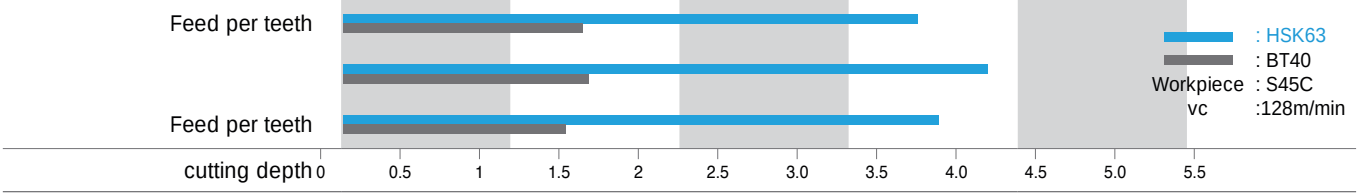
As taper of holder will deform elastically following the profile of the spindle shape, there is no eccentricity between the spindle and the other. Also, due to perfect face contact between flange surface of the holder and spindle face, bending strength of the holder is very high, which makes radial and axial and accuracy very high.





High Rigidity Against Bending Load

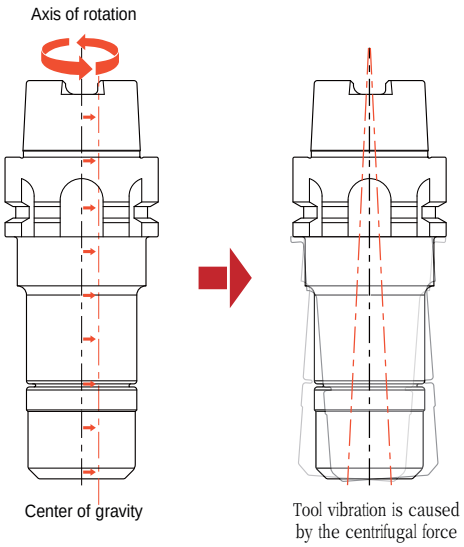
HSK 63	BT 40
	
	



M This is metric size. We can also provide in inch type

Balancing System

Imbalance



▶ Cause of imbalance
Imbalance occurs due to the asymmetry of tool geometries and spindle run-out

▶ Difficulties of imbalance
Shorter tool life, inferior surface roughness and noise are caused by vibration during rotation and damage on spindle bearing

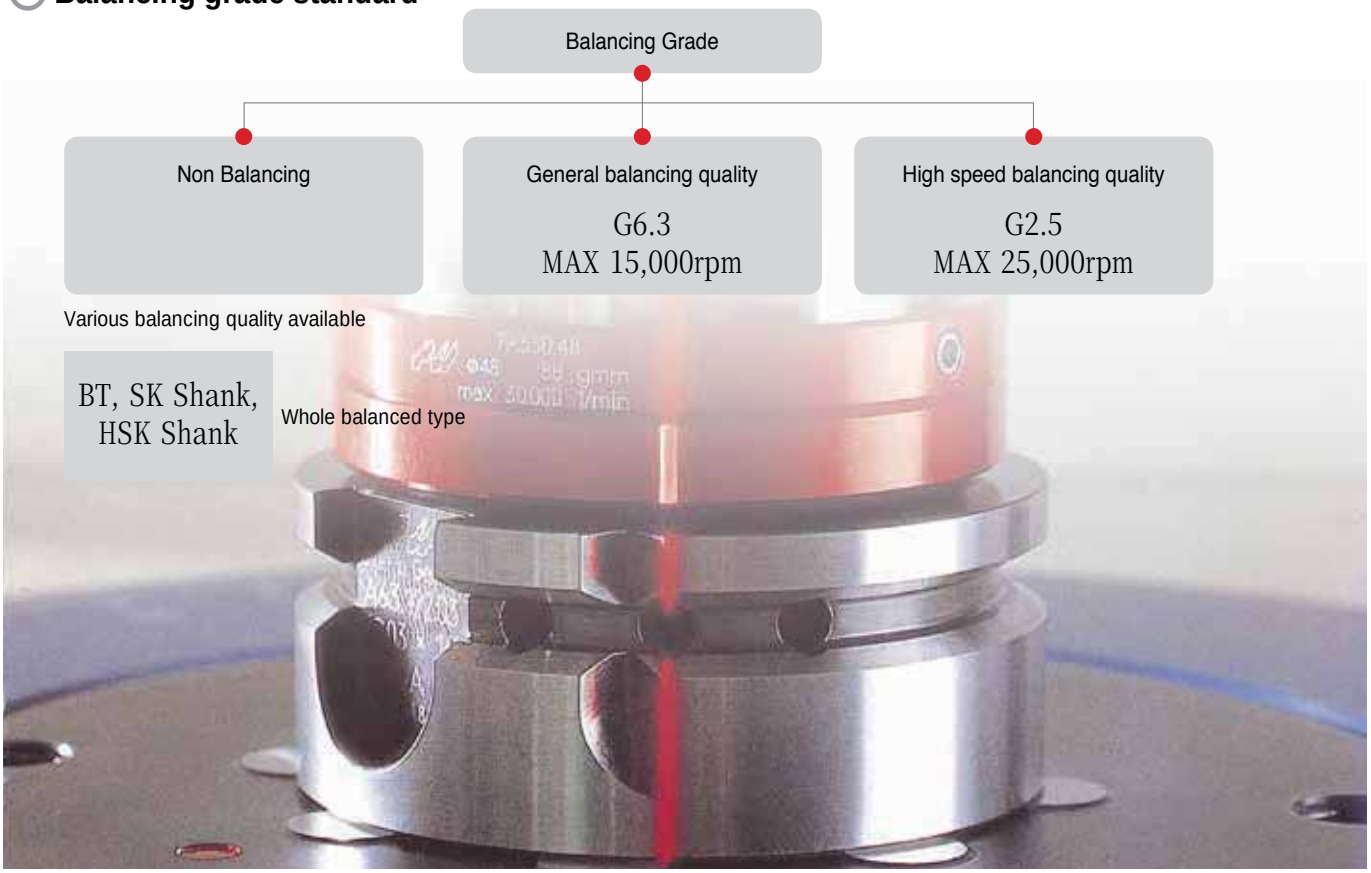
▶ Need for balancing
Balancing is needed to prevent unbalance for better surface roughness, precision and tool life

※ A case that the tool's center of gravity deviates from the rotation axis

The most optimal accuracy at high speed

1. Without bending from rotation of an unbalanced load, High accuracy and rigidity are maintained
2. Excellent Balance(≤G1.0 or 0.5 g·mm/kg)
3. Tool life, surface finish, dimension of accuracy and productivity can be realized at high speed

Balancing grade standard



M This is metric size. We can also provide in inch type

M This is metric size. We can also provide in inch type

Hydraulic expansion chuck

DHE Series

- Ideal for mold making and machining automobile components & precise parts due to high precision machining
- Improved surface roughness due to vibration proof by hydraulic chamber
- Reduced replacement time and tiredness of worker with the use of T wrench for removal
- Applicable shank diameter : D3-32

Code System

BT40 - DHE 20 - 140

BT40	DHE	20	140
Spindle	Hydraulic Expansion Chuck	Max. Chucking dia.	Length

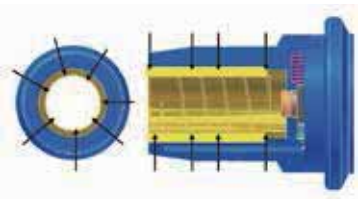
Features

High accuracy provides long tool life due to reduced wear and hydraulic room enhances a surface roughness by lessening vibrations.

- RUN OUT : under 5㎛
- L = 3 x ØD
- Shank : Tolerance of ØD : h6

Internal sealing structure(Durability)

- Internal sealing system protects the chuck against dust, cutting oil, lubricant and chips getting into it.
- Maintaining clamping force and accuracy for a long time



SHANK	Grade	Max.rpm
BT50, SK50, HSK100A	G6.3	10,000
BT40, SK40, HSK63A		15,000
BT30, HSK50A, SK30		20,000
HSK40A	-	25,000

With simple T-Wrench, very easy to change a tool

- Clamping structure for easy operation (Convenience)
: Decrease of worker's fatigue
: Improving machine capacity

Strong clamping

The clearance between holder and tool is fixed by hydraulic pressure

M This is metric size. We can also provide in inch type

BT-DHE

MAS403-BT

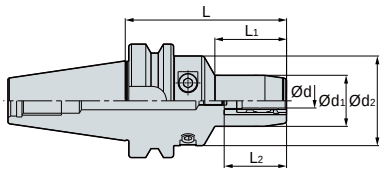


Fig. 1

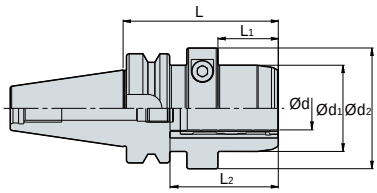


Fig. 2

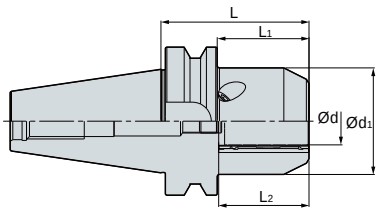


Fig. 3

(mm)

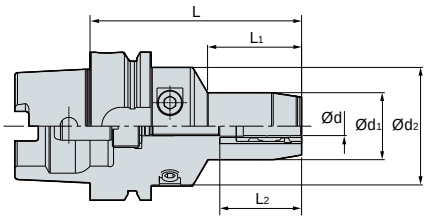
Designation			Ød	L	Ød1	Ød2	L1	L2	Screw	Fig.	kg
BT30 -	DHE 6 -	65	6	65	29	45	33	30~39.8	M5	1	0.7
	DHE 8 -	65	8	65	31	45	33	30~39.8	M5	1	0.7
	DHE 10 -	65	10	65	33	45	34	35~44.8	M10	1	0.7
	DHE 12 -	65	12	65	35	45	34	41~50.8	M10	1	0.7
	DHE 14 -	90	14	90	36	45	40	43~52.8	M10	1	0.9
	DHE 16 -	90	16	90	40	45	45	46~55.8	M10	1	1.0
	DHE 18 -	90	18	90	42	45	40	49~58.8	M10	1	1.0
	DHE 20 -	90	20	90	44	45	45	49~58.8	M10	1	1.1
BT40 -	DHE 6 -	90	6	90	29	50	40	30~39.8	M5	1	1.4
		140	6	140	29	50	40	30~39.8	M5	1	2.2
	DHE 8 -	90	8	90	31	50	40	30~39.8	M5	1	1.4
		140	8	140	31	50	40	30~39.8	M5	1	2.2
	DHE 10 -	90	10	90	33	50	40	35~44.8	M5	1	1.5
		140	10	140	33	50	40	35~44.8	M5	1	2.2
	DHE 12 -	90	12	90	35	50	40	41~50.8	M10	1	1.5
		140	12	140	35	50	40	41~50.8	M10	1	2.3
	DHE 14 -	90	14	90	36	50	40	43~52.8	M10	1	1.5
		140	14	140	36	50	40	43~52.8	M10	1	2.3
	DHE 16 -	90	16	90	40	50	45	46~55.8	M10	1	1.5
		140	16	140	40	50	45	46~55.8	M10	1	2.3
	DHE 18 -	90	18	90	42	50	45	49~58.8	M10	1	1.5
		140	18	140	42	50	45	49~58.8	M10	1	2.3
	DHE 20 -	90	20	90	44	50	47	49~58.8	M10	1	1.5
		140	20	140	44	50	47	49~58.8	M10	1	2.3
	DHE 25 -	90	25	90	50	70	35	58~67.8	M16	2	1.9
	DHE 32 -	90	32	90	63	80	35	58~67.8	M16	2	2.0
BT50 -	DHE 6 -	90	6	90	29	50	34	30~39.8	M5	1	3.9
		140	6	140	29	50	34	30~39.8	M5	1	4.5
	DHE 8 -	90	8	90	31	50	34	30~39.8	M5	1	3.9
		140	8	140	31	50	34	30~39.8	M5	1	4.5
	DHE 10 -	90	10	90	33	50	34	35~44.8	M5	1	3.9
		140	10	140	33	50	34	35~44.8	M5	1	4.5
	DHE 12 -	90	12	90	35	50	34	41~50.8	M10	1	4.0
		140	12	140	35	50	34	41~50.8	M10	1	4.6
	DHE 14 -	90	14	90	36	50	34	43~52.8	M10	1	4.0
		140	14	140	36	50	34	43~52.8	M10	1	4.6
	DHE 16 -	90	16	90	40	50	34	46~55.8	M10	1	4.1
		140	16	140	40	50	34	46~55.8	M10	1	4.7
	DHE 18 -	90	18	90	42	50	34	49~58.8	M10	1	4.1
		140	18	140	42	50	34	19~58.8	M10	1	4.7
	DHE 20 -	90	20	90	44	50	34	49~58.8	M10	1	4.2
		140	20	140	44	50	34	49~58.8	M10	1	4.7
	DHE 25 -	90	25	90	66	-	52	58~67.8	M16	3	4.7
	DHE 32 -	90	32	90	72	-	52	58~67.8	M16	3	4.8

Spare Part I8 Collet I8

• L_2 : Insertion depth of tool(Min.~max.) • Through coolant system available

M This is metric size. We can also provide in inch type

HSK-DHE



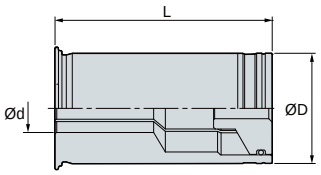
(mm)

Designation			Ød	L	Ød1	Ød2	L1	L2	Screw	kg
HSK63A -	DHE 6 -	75	6	75	29	50	34	30~39.8	M5	1.0
	DHE 8 -	75	8	75	31	50	34	30~39.8	M5	1.0
	DHE 10 -	85	10	85	33	50	34	35~44.8	M5	1.2
	DHE 12 -	90	12	90	35	50	40	41~50.8	M10	1.2
	DHE 16 -	95	16	95	40	50	45	46~55.8	M10	1.3
	DHE 20 -	100	20	100	44	50	50	49~58.8	M10	1.4
		150	20	150	44	50	50	49~58.8	M10	2.0
HSK100A -	DHE 20 -	105	20	105	44	50	50	49~58.8	M10	2.8
	DHE 25 -	115	25	90	50	63	62	58~67.8	M16	3.3
	DHE 32 -	115	32	90	63	75	62	58~67.8	M16	3.8

• L2 : Insertion depth of tool(Min.~max.) • Through coolant system is optional.

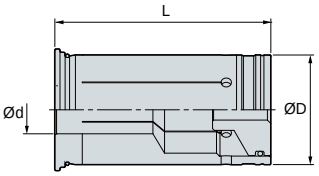
M This is metric size. We can also provide in inch type

DHC Collet (General type)



Designation		ØD	Ød	L
DHC12 -	3, 4, 5, 6, 8	12	3, 4, 5, 6, 8	47
DHC20 -	3, 4, 5 , 6, 8, 10, 12, 14, 16	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 -	6, 8, 10, 12, 14, 16, 18, 20, 25	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

DHC Collet (Accuracy type)



Designation		ØD	Ød	L
DHC12 -	3(P), 4(P), 5(P), 6(P), 8(P)	12	3, 4, 5, 6, 8	47
DHC20 -	3(P), 4(P), 5(P), 6(P), 8(P), 10(P), 12(P), 14(P), 16(P)	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 -	6(P), 8(P), 10(P), 12(P), 14(P), 16(P), 18(P), 20(P), 25(P)	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

Parts

Spare Parts					
Chuck		Clamp Screw	Wrench	Chuck	Screw
Type				Type	
BT30 / SK30 / HSK50	DHE 6, 8, 10, 12	DHE-M8(C)	DHETW-4	DHE 6, 8, 10	DHE-M5 (ADJ)
BT30 / SK30 / HSK50	DHE 14, 16, 18, 20	DHE-M10(C)	DHETW-5		
HSK63A / HSK100A / BT40 / BT50 / SK40 / SK50	DHE 6, 8, 10, 12, 14, 16, 18, 20			DHE 12, 16, 20	DHE-M10 (ADJ)
HSK63A / HSK100A / BT40 / BT50 / SK40 / SK50	DHE 25, 32	DHE-M12(C)	DHETW-6	DHE 25, 32	DHE-M16 (ADJ)

Shrinking Chuck

DSC

- Use of specially heat-treated steel
- High precision machining and clamping
- Increased precision and longer tool life due to minimized overhang when machining deep grooves
- Applicable shank diameter : D3-32

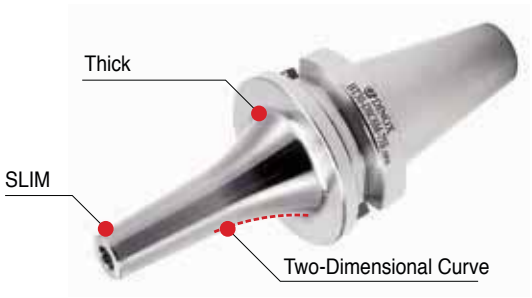
Code System

BT50 - DSC 6 - S - 165 - S

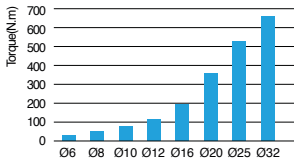
Shank type	Holder type	Tool Dia.	Type	Length	Special
BT, HSK, SK, ST, CS, CM	DSC : Shrinking chuck SLK : 2piece holder Collet		S : Silm M : Middle NON : general		S : CURVE TYPE NON : general

Mono Curve type

- Integral DSC with excellent precision and balancing
- Long but stable holder design

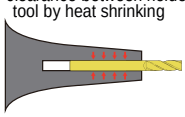
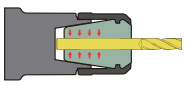


High Clamping Force



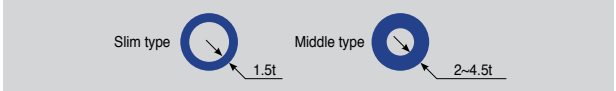
Symmetric Design

- 30 % stronger Clamping Force
- Run-Out (≤ 0.003mm)
- Higher Power transmission Clamping Force by Inner-Size.

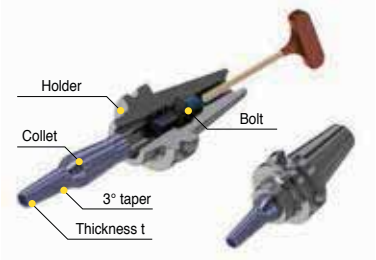
Shrinking chuck	Collet chuck
Fix the clearance between holder and tool by heat shrinking	Fix the tool by elasticity of collet
	
Thermal expansion ▶ Thermal shrinking	Elastic deformation
Highly strong clamping	Strong clamping

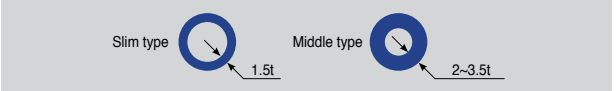
Mono type

Figure	Accuracy
	 Run-out 3㎛



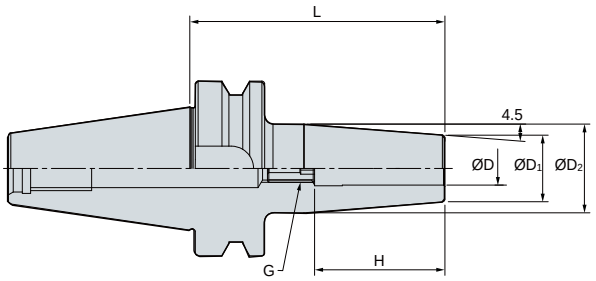
2-pieces type

Figure	Accuracy
	 Run-out 5㎛



M This is metric size. We can also provide in inch type

BT-DSC



(mm)

Designation			ØD	L	ØD1	ØD2	H	G	kg
BT30 -	DSC3 -	60	3	60	11	18.5	82	-	0.6
	DSC4 -	60	4	60	13	20.5	82	-	0.6
BT40 -	DSC6 -	90	6	90	21	27	36	M5	1.2
		120	6	120	21	27	36	M5	1.2
		160	6	160	21	27	36	M5	1.4
	DSC8 -	90	8	90	21	27	36	M5	1.2
		120	8	120	21	27	36	M5	1.2
		160	8	160	21	27	36	M5	1.4
	DSC10 -	90	10	90	24	32	42	M8	1.2
		120	10	120	24	32	42	M8	1.2
		160	10	160	24	32	42	M8	1.6
	DSC12 -	90	12	90	24	32	47	M8	1.2
		120	12	120	24	32	48	M8	1.2
		160	12	160	24	32	49	M8	1.6
	DSC16 -	90	16	90	27	34	50	M12	1.3
		120	16	120	27	34	50	M12	1.3
		160	16	160	27	34	50	M12	1.7
	DSC20 -	90	20	90	33	42	52	M12	1.3
		120	20	120	33	42	52	M12	1.5
		160	20	160	33	42	52	M12	2.1

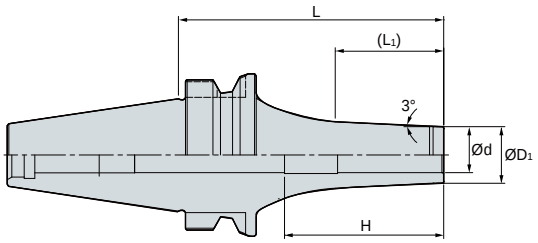
Adjust screw **I16**

• Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/M Mono Curve type

New



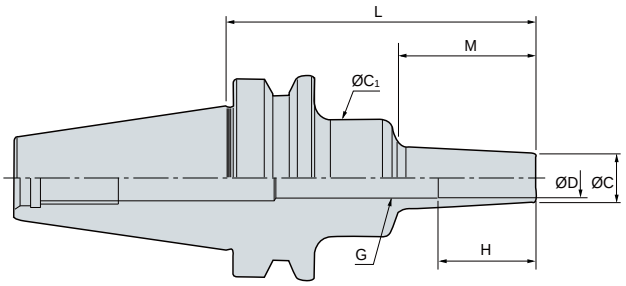
(mm)

Designation			ØD	L	L1	ØD1	ØC1	H	G	kg
BT30 -	DSC3M -	75S	3	75	29.8	8	25	97	-	0.6
	DSC4M -	75S	4	75	31.8	10	25	97	-	0.6
	DSC6M -	75S	6	75	28.9	12	30	97	-	0.6
	DSC8M -	75S	8	75	28.9	14	32	97	-	0.6
	DSC10M -	75S	10	75	30.66	16	32	45	-	0.6

• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/M Mono type



(mm)

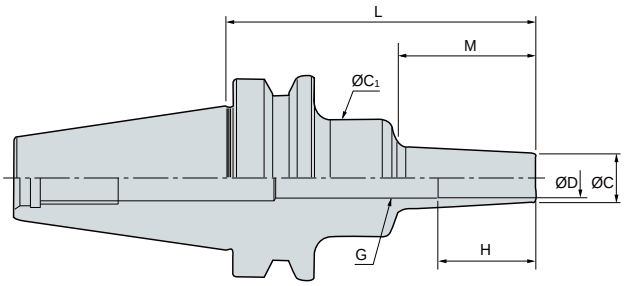
Designation			ØD	L	ØD1	ØC1	M	H	G	kg
BT40 -	DSC6M -	95	6	95	10	26	42	18	M5	1.2
		120	6	120	10	26	67	18	M5	1.2
		160	6	160	10	36	97	18	M5	1.5
	DSC8M -	95	8	95	13	36	42	24	M5	1.2
		120	8	120	13	36	67	24	M5	1.2
		160	8	160	13	36	97	24	M5	1.5
	DSC10M -	95	10	95	16	36	42	30	M8	1.2
		120	10	120	16	36	67	30	M8	1.2
		160	10	160	16	36	97	30	M8	1.5
	DSC12M -	95	12	95	19	36	42	30	M8	1.2
		120	12	120	19	36	67	30	M8	1.2
		160	12	160	19	36	97	30	M8	1.5
	DSC16M -	95	16	95	24	50	42	32	M12	1.2
		120	16	120	24	50	67	32	M12	1.2
		160	16	160	24	50	97	32	M12	1.5
	DSC20M -	95	20	95	29	50	42	40	M12	1.2
		120	20	120	29	50	67	40	M12	1.2
		160	20	160	29	50	97	40	M12	1.5
BT50 -	DSC6M -	110	6	110	10	26	42	18	M5	3.5
		160	6	160	10	36	97	18	M5	4
	DSC8M -	110	8	110	13	36	42	24	M5	3.5
		160	8	160	13	36	97	24	M5	4
	DSC10M -	110	10	110	16	36	42	30	M8	3.5
		160	10	160	16	36	97	30	M8	4
	DSC12M -	110	12	110	19	36	42	30	M8	3.5
		160	12	160	19	50	97	30	M8	4
	DSC16M -	110	16	110	24	50	42	32	M12	3.5
		160	16	160	24	50	97	32	M12	4
	DSC20M -	110	20	110	29	50	42	40	M12	3.5
		160	20	160	29	50	97	40	M12	4

Adjust screw **I16**

• Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/S Mono Slim type



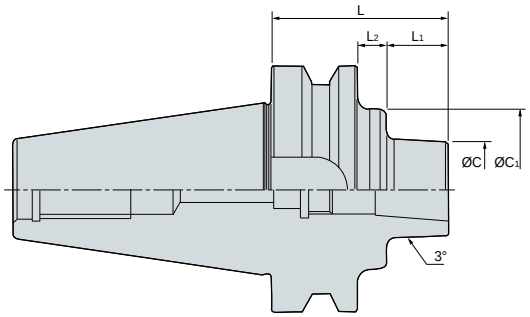
(mm)

Designation			ØD	L	ØD1	M	H	G
BT30 -	DSC6S -	60	6	60	9	20	22	18
		80	6	80	9	20	42	18
		120	6	120	9	25	67	18
BT40 -	DSC6S -	95	6	95	9	26	42	18
		120	6	120	9	26	67	18
		160	6	160	9	36	97	18
	DSC8S -	95	8	95	11	36	42	24
		120	8	120	11	36	67	24
		160	8	160	11	36	97	24
	DSC10S -	95	10	95	13	36	42	30
		120	10	120	13	36	67	30
		160	10	160	13	36	97	30
	DSC12S -	95	12	95	15	36	42	30
		120	12	120	15	36	67	30
		160	12	160	15	36	97	30
BT50 -	DSC6S -	110	6	110	9	26	42	18
		160	6	160	9	36	97	18
	DSC8S -	110	8	110	11	36	42	24
		160	8	160	11	36	97	24
	DSC10S -	110	10	110	13	36	42	30
		160	10	160	13	36	97	30
	DSC12S -	110	12	110	15	36	42	30
		160	12	160	15	36	97	30

• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

BT-SLK 2-pieces type



(mm)

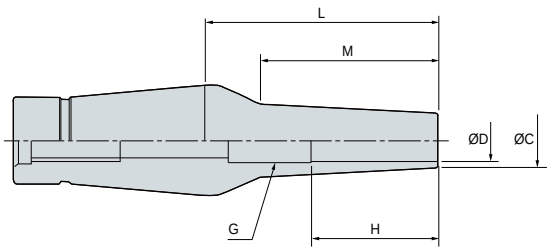
Designation			L	ØC	L1	L2	ØC1
BT30 -	SLK12 -	35	35	38	13	-	-
BT40 -	SLK12 -	45	45	38	18	-	-
		45F	45	41	18	-	-
		75	75	38	48	-	-
		75F	75	41	48	-	-
		135F	135	41	108	-	-
BT50 -	SLK12 -	75	75	38	25	12	65
		75F	75	41	25	12	65
		105F	105	41	55	12	65
		135F	135	41	85	12	65
		225	225	38	150	37	65
		315	315	38	150	127	90

Spare Part I16

• Through coolant system available • PULL STUD BOLT is needed for BT30-SLK12-35

M This is metric size. We can also provide in inch type

CS/CM 2-pieces type



(mm)

Designation			ØD	ØC	L	M	H
CS12 -	6 -	36	6	9	35	22	18
		55	6	9	55	42	18
		80	6	9	80	67	18
		110	6	9	110	97	18
	8 -	35	8	11	35	22	24
		55	8	11	55	42	24
		80	8	11	80	67	24
		110	8	11	110	97	24
	10 -	35	10	13	35	22	30
		55	10	13	55	42	30
		80	10	13	80	67	30
		110	10	13	110	97	30
	12 -	35	12	15	35	22	30
		55	12	15	55	42	30
		80	12	15	80	67	30
		110	12	15	110	97	30

• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

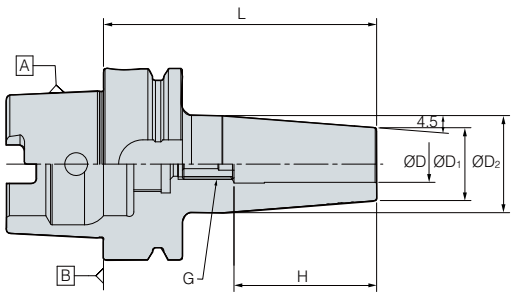
(mm)

Designation			ØD	ØC	L	M	H
CM12 -	6 -	35	6	12	35	22	18
		55	6	12	55	42	18
		80	6	12	80	67	18
	8 -	35	8	14	35	22	24
		55	8	14	55	42	24
		80	8	14	80	67	24
	10 -	35	10	16	35	22	30
		55	10	16	55	42	30
		80	10	16	80	67	30
	12 -	35	12	20	35	22	30
		55	12	20	55	42	30
		80	12	20	80	67	30

Adjust screw **I16** • Through coolant system available

M This is metric size. We can also provide in inch type

HSK-DSC/M Mono type



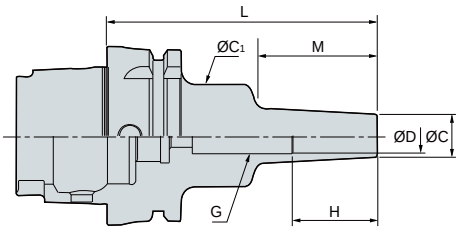
(mm)

Designation		ØD	L	ØD1	ØC1	M	H	G
HSK63A -	DSC6M - 95	6	95	10	26	42	18	M5
	DSC8M - 95	8	95	13	36	42	24	M5
	DSC10M - 120	10	120	16	36	67	30	M8
	DSC12M - 120	12	120	19	36	67	30	M8
	DSC16M - 120	16	120	24	50	67	32	M12

• Not able to use the adjust screw • Through coolant system is optional.

M This is metric size. We can also provide in inch type

HSK-DSC/S Mono type



(mm)

Designation		ØD	L	ØD1	ØC1	M	H
HSK63A -	DSC6S - 95	6	95	9	26	42	18
	120	6	120	9	26	67	18
	DSC8S - 95	8	95	11	36	42	24
	160	8	160	11	36	97	24
	DSC10S - 95	10	95	13	36	42	30
	160	10	160	13	36	97	30
	DSC12S - 95	12	95	15	36	42	30
	160	12	160	15	36	97	30

• Not able to use the adjust screw • Through coolant system is optional.

M This is metric size. We can also provide in inch type

Parts

Spare Parts											
Type		DSC6	DSC8	DSC10	DSC12	DSC14	DSC16	DSC18	DSC20	DSC25	DSC32
Screw		M520C		M820C		M1230C					

Champion milling chuck

CPM

- Improved tool life by blocking dust and lubricant leaking with perfect sealing structure on O-ring and Nut
- Available through coolant system with CTC set
- Length regulator is inserted in CPM, user can adjust length conveniently.

Code System

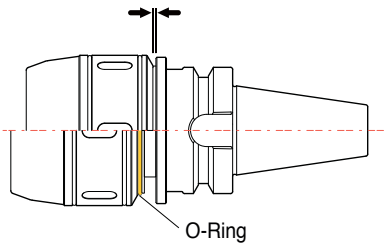
BT40 - CPM 32 - 105

BT40	CPM	32	105
Spindle	Champion Milling Chuck	Max. Chucking dia.	Length

Prevention of grease leak and dust proof

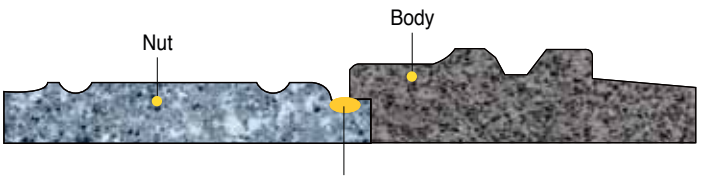
CPM has O-Ring on nuts to absorb cutting vibration for stable operation and prevents inflow of debris.

Face contact for stable machining and dust proof

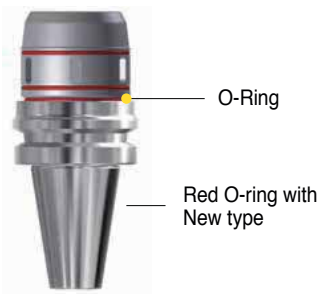


Correlation of oil leaking and tool life

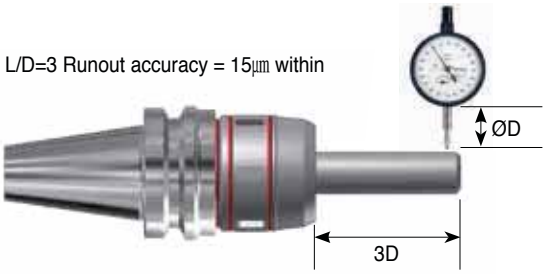
Obvious increase of tool life
after applying dust proof system



O-Ring : Blocking lubricant leakage and dust entry → **Enhanced tool life**

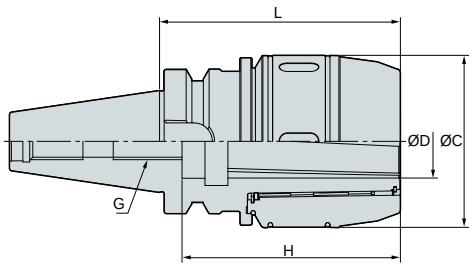


L/D=3 Runout accuracy = 15㎛ within



M This is metric size. We can also provide in inch type

BT-CPM



(mm)

Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	CPM20 -	80	20	80	54	85	M16	DC20, DSC20	1.1
BT40 -	CPM20 -	90	20	90	54	85	M16	DC20, DSC20	2.3
	CPM32 -	90	32	90	75	85	M16	DC32, DCS32	2.8
		105	32	105	75	95	M16	DC32, DCS32	2.9
BT50 -	CPM32 -	105	32	105	75	105	M24	DC32, DCS32	5.0
		135	32	135	75	105	M24	DC32, DCS32	5.8
		165	32	165	75	105	M24	DC32, DCS32	6.8

• Order-made sets available • Through coolant system is optional.

M This is metric size. We can also provide in inch type

New power milling chuck

NPM

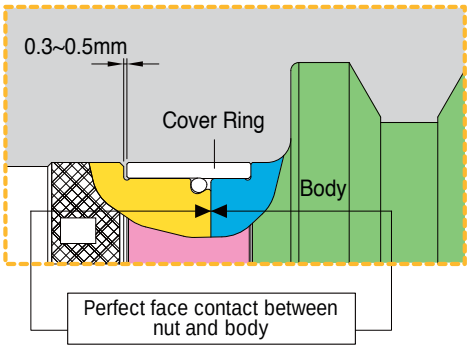
- Strong clamping over 500kgf·m(on NPM42 basis)
- DUST BLOCK functions for blocking foreign substance
- Jet coolant available
- High precision within 15㎛ at L/D=3
- Applicable shank diameter : D6-42

Code System

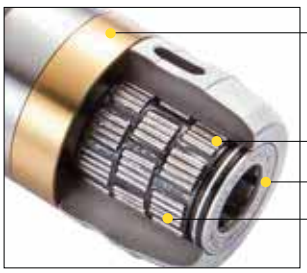
BT40 - NPM 32 - 110

- BT40 — Spindle
- NPM — New Power Milling Chuck
- 32 — Max. Chucking dia.
- 110 — Length

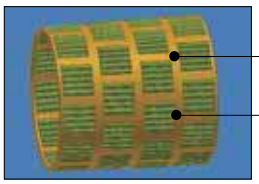
Improvement of Durability by preventing minute dust, chips and coolant



Adopted Stop Ring on Head parts
- Preventing minute dust by Shim&O-Ring



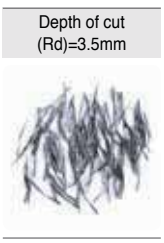
Needle Roller Bearing

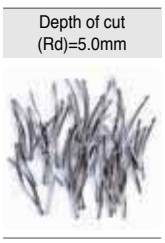


- Specially designed Steel Bearing for prevention of damage
- Strong Clamping by spreading the force

Stable machining from Heavy to Fine

Perfect face contact and Powerful clamping force strengthen both Cutting force and Absorbtion of vibration.

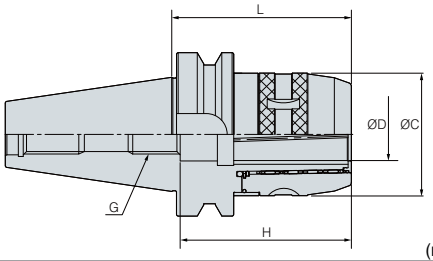




Possible machining from heavy milling to fine finishing

M This is metric size. We can also provide in inch type

BT-NPM



(mm)

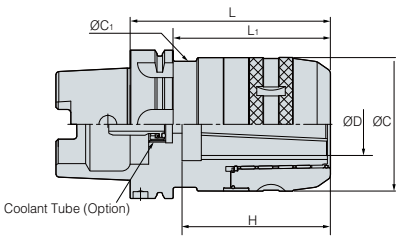
Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	NPM20 -	85	20	85	54	85	M16	DC20, DSC20	1.1
BT40 -		85	20	85	54	85	M16	DC20, DSC20	2.3
		100	20	100	54	85	M16	DC20, DSC20	2.3
	NPM25 -	85	25	85	61	83.2	M16	DC25, DSC25	2.5
	NPM32 -	90	32	90	75	85	M16	DC32, DCS32	2.8
		110	32	110	75	95	M16	DC32, DCS32	2.9
		135	32	135	75	95	M16	DC32, DCS32	3.5
BT50 -	NPM20 -	95	20	95	54	85	M24	DC20, DSC20	4.3
		125	20	125	54	85	M24	DC20, DSC20	4.8
		165	20	165	54	85	M24	DC20, DSC20	5.3
	NPM32 -	110	32	110	75	105	M24	DC32, DCS32	5.0
		135	32	135	75	105	M24	DC32, DCS32	5.8
		165	32	165	75	105	M24	DC32, DCS32	6.8
	NPM42 -	110	42	110	90	125	M24	DC42, DCS42	5.4
		135	42	135	90	125	M24	DC42, DCS42	6.6
		165	42	165	90	125	M24	DC42, DCS42	8.0

Applicable collet I21

- Through coolant system available is optional
- In case of L ≤ 90, chucks with over 90mm are recommended for medium cutting by short cap.

M This is metric size. We can also provide in inch type

HSK-NPM



(mm)

Designation			ØD	L	L1	ØC	H	G	Collet	kg
HSK63A -	NPM20 -	100	20	85	54	85	M16	M16	DC20, DSC20	1.1
	NPM32 -	120	42	135	90	125	M24	M24	DC42, DCS42	6.6
HSK100A -	NPM32 -	130	42	165	90	125	M24	M24	DC42, DCS42	8.0

Applicable collet I21

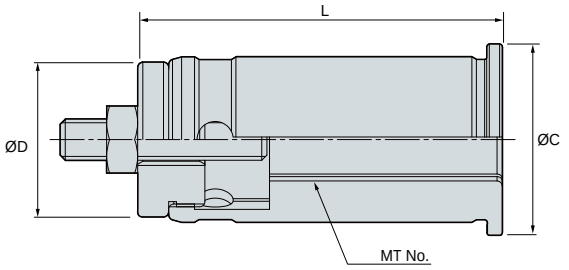
- Through coolant system is optional.

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts		
	Option		
	Collet	Spanner	Through Coolant System
Type			
NPM20	DC20, DCS20	57-60	CTC20-20
NPM32	DC32, DCS32	75-79	CTC32-32
NPM42	DC42, DCS42	92-96	CTC42-42

DCS Straight Collet

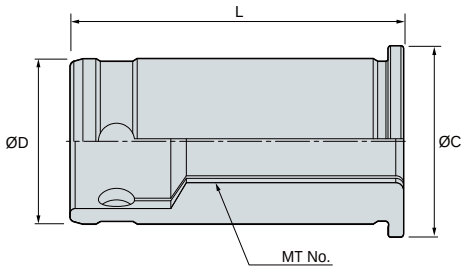


(mm)

Designation	ØD	Ød	ØC	L	kg
DCS20 - 6, 8, 10, 12, 16	20	6, 8, 10, 12, 16	26	55	0.2
DCS25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	66.5	0.3
DCS32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DCS42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

M This is metric size. We can also provide in inch type

DC Straight Collet

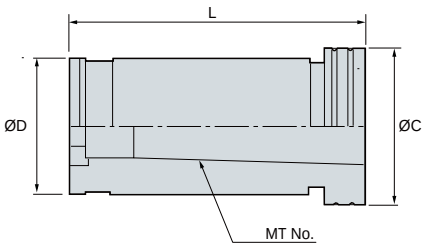


(mm)

Designation	ØD	Ød	ØC	L	kg
DC20 - 6, 8, 10, 12, 14, 16	20	6, 8, 10, 12, 14, 16	26	55	0.2
DC25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	61.5	0.3
DC32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DC42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

M This is metric size. We can also provide in inch type

TC Taper Collet



(mm)

Designation	MT No.	ØD	ØC	L
TC20 - 1	MT1	20	26	60
TC20 - 2	MT2	20	26	72
TC25 - 1	MT1	25	32	60
TC25 - 2	MT2	25	32	72
TC32 - 1	MT1	32	38	60
TC32 - 2	MT2	32	38	72

Designation	MT No.	ØD	ØC	L
TC32 - 3	MT3	32	38	90
TC42 - 1	MT1	42	48	60
TC42 - 2	MT2	42	48	72
TC42 - 3	MT3	42	48	90
TC42 - 4	MT4	42	48	112.5

M This is metric size. We can also provide in inch type

Collet Chuck Series

- High Accuracy and Powerful clamping force
- Convenient tool change
- Various models
- Chucking DiameterØ0.5 ~Ø34.0mm

Collet Chuck Series

Collet Chuck

SDC

- Max. Chucking dia. : Ø34.0mm
- For use of Drilling, Reaming, Endmilling and Tapping etc.

Slim Collet Chuck

SDC/S

- Max. Chucking dia. : Ø16.0mm
- For use of Drilling, Reaming, Endmilling of narrow and deep place

High Speed Collet Chuck

HPS

- Max. Chucking dia. : Ø20.0mm
- Balanced G6.3
- Max. Revolution : 15,000rpm

High Speed Slim Collet Chuck

GSK

- Max. Chucking dia. : Ø25.0mm
- Balanced G2.5
- Max. Revolution : 25,000rpm

High Precision Collet

- Accuracy type : 5㎛(GER-B)
- High accuracy type : 2㎛(GER-HP)
- Through Coolant type

- Accuracy type
- High accuracy type

- Through Coolant type

M This is metric size. We can also provide in inch type

Collet chuck

SDC

- ER collet chuck, standard type for general machining
- Applicable shank diameter : D0.5~34

First-class nut (SWISS Made)

Easy clamping of collets

Special hardening treatment

SDC
(For low speed machining)

High speed collet chuck

HPS

- Available for machining at max.15,000RPM and balancing of G6.3
- ER collet chuck proper for high speed machining with its use of Swiss made sleeve nut and balancing
- Applicable shank diameter : D0.5~34

First-class nut (SWISS Made)

Specialized design for dust proof

Smooth sleeve bearing

Nuts can be differently used according to the purpose

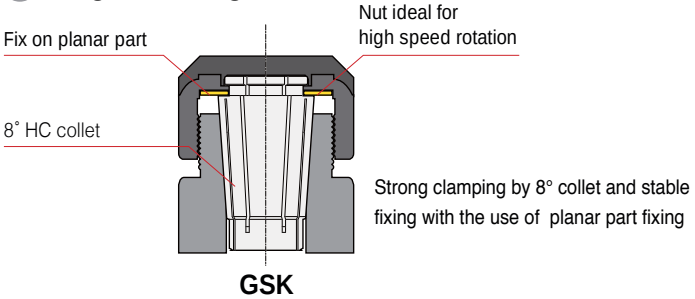
HPS
(For high speed machining)

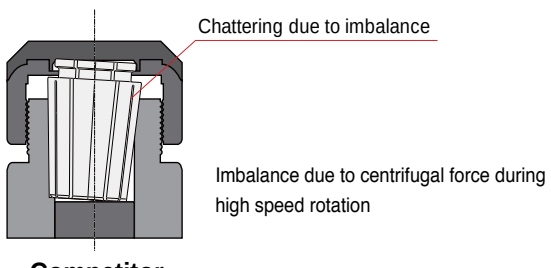
Great speed slim collet chuck

GSK

- Available for machining at max.25,000RPM and balancing of G2.5
- Increased productivity due to high speed machining
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability by pressing collet uniformly.
- Applicable shank diameter : D0.5~34

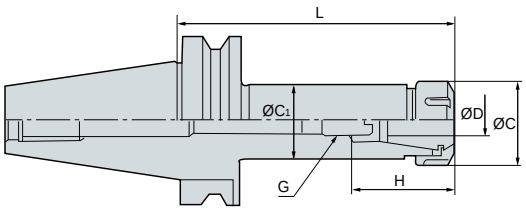
Original design





M This is metric size. We can also provide in inch type

BT-SDC



(mm)

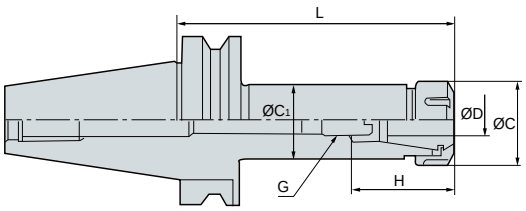
Designation			ØD	L	H	Collet / Step	G	ØC	ØC1	kg
BT30 -	SDC7 -	50	1.0~7.0	50	50	GER11/0.5	M7	19	19	0.5
		75	1.0~7.0	75	75	GER11/0.5	M7	19	19	0.5
		105	1.0~7.0	105	105	GER11/0.5	M7	19	19	0.6
	SDC10 -	50	1.0~10.0	50	50	GER16/1.0	M10	28	28	0.5
		75	1.0~10.0	75	75	GER16/1.0	M10	28	28	0.5
		105	1.0~10.0	105	105	GER16/1.0	M10	28	28	0.6
	SDC13 -	50	1.0~13.0	50	50	GER20/1.0	M7	35	35	0.5
		75	1.0~13.0	75	75	GER20/1.0	M13	35	35	0.6
		105	1.0~13.0	105	105	GER20/1.0	M13	35	35	0.7
	SDC16 -	50	1.0~16.0	50	50	GER25/1.0	M7	42	42	0.6
		75	1.0~16.0	75	75	GER25/1.0	M18	42	42	0.7
		105	1.0~16.0	105	105	GER25/1.0	M18	42	42	0.8
	SDC20 -	60	1.0~20.0	60	60	GER32/1.0	M7	50	44	0.5
		90	1.0~20.0	90	90	GER32/1.0	M22	50	44	0.8
		120	1.0~20.0	120	120	GER32/1.0	M22	50	44	1.0
BT40 -	SDC7 -	60	1.0~7.0	60	60	GER11/0.5	M7	19	19	1.0
		90	1.0~7.0	90	90	GER11/0.5	M7	19	19	1.1
		135	1.0~7.0	135	135	GER11/0.5	M7	19	19	1.2
	SDC10 -	60	1.0~10.0	60	60	GER16/1.0	M10	28	28	1.1
		90	1.0~10.0	90	90	GER16/1.0	M10	28	28	1.2
		135	1.0~10.0	135	135	GER16/1.0	M10	28	28	1.4
	SDC13 -	60	1.0~13.0	60	60	GER20/1.0	M13	35	35	1.1
		90	1.0~13.0	90	90	GER20/1.0	M13	35	35	1.3
		120	1.0~13.0	120	120	GER20/1.0	M13	35	35	1.5
		150	1.0~13.0	150	150	GER20/1.0	M13	35	35	1.8
	SDC16 -	60	1.0~16.0	60	60	GER25/1.0	M18	42	42	1.2
		90	1.0~16.0	90	90	GER25/1.0	M18	42	42	1.4
		120	1.0~16.0	120	120	GER25/1.0	M18	42	42	1.6
	SDC20 -	60	1.0~20.0	60	60	GER32/1.0	M7	50	44	1.1
		90	1.0~20.0	90	90	GER32/1.0	M22	50	44	1.4
		120	1.0~20.0	120	120	GER32/1.0	M22	50	44	1.7
	SDC26 -	90	3.0~26.0	90	90	GER40/1.0	M28	63	54	2.4

Spare Part I26

- Through coolant system is optional.
- Collets in the right size are recommended for oil hole type.

M This is metric size. We can also provide in inch type

BT-SDC



(mm)

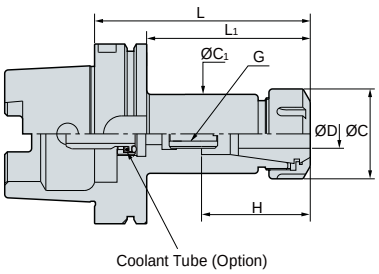
Designation			ØD	L	H	Collet / Step	G	ØC	ØC1	kg
BT50 -	SDC10 -	90	1.0~10.0	90	44.5	GER16/1.0	M10	28	28	3.8
		120	1.0~10.0	120	44.5	GER16/1.0	M10	28	28	4.0
		165	1.0~10.0	165	44.5	GER16/1.0	M10	28	28	4.2
	SDC13 -	105	1.0~13.0	105	49	GER20/1.0	M13	35	35	3.9
		135	1.0~13.0	135	49	GER20/1.0	M13	35	35	4.1
		165	1.0~13.0	165	49	GER20/1.0	M13	35	35	4.5
	SDC16 -	105	1.0~16.0	105	50	GER25/1.0	M18	42	42	4.1
		165	1.0~16.0	165	50	GER25/1.0	M18	42	42	4.4
	SDC20 -	75	1.0~20.0	75	60	GER32/1.0	M7	50	44	4.0
		105	1.0~20.0	105	60	GER32/1.0	M22	50	44	4.3
		135	1.0~20.0	135	60	GER32/1.0	M22	50	44	4.9
		165	1.0~20.0	165	60	GER32/1.0	M22	50	44	5.0
		180	1.0~20.0	180	60	GER32/1.0	M22	50	44	5.0
	SDC26 -	165	3.0~26.0	165	70	GER40/1.0	M28	63	54	6.0

Spare Part I26

- Through coolant system is optional.
- Collets in the right size are recommended for oil hole type.

M This is metric size. We can also provide in inch type

HSK-SDC



(mm)

Designation		ØD	L	H	Collet / Step	G	ØC	ØC1	kg
HSK63A -	SDC10 - 95	1.0~10.0	95	44.5	GER16/1.0	M10	28	28	1.0
	SDC13 - 95	1.0~13.0	95	49	GER20/1.0	M13	35	35	1.2
	SDC16 - 100	1.0~16.0	90	50	GER25/1.0	M18	42	42	1.3
	SDC20 - 110	1.0~20.0	110	60	GER32/1.0	M13	50	44	1.4
HSK100A -	SDC16 - 110	1.0~16.0	110	50	GER25/1.0	M18	42	42	3.2
	SDC20 - 120	2.0~20.0	120	60	GER32/1.0	M10	50	44	3.4

Spare Part I26

- Through coolant system is optional.
- Collets in the right size are recommended for oil hole type.

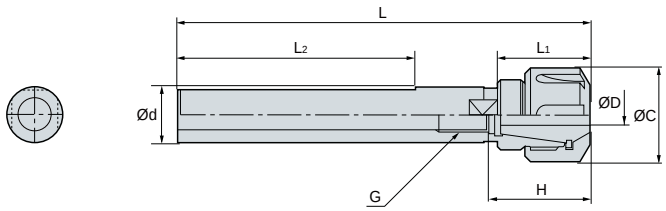
M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts					
	Basic			Option		
	Nut		Adjust screw	Spanner		(G)ER Collet
Type						
SDC7	R11	-	BN0716F	S-17	-	GER/ER 11-ØD
SDC10	R16	-	BN1025F	S-25	-	GER/ER 16-ØD
SDC13	-	RU20 - SDC13	BN1325F	-	35-38	GER/ER 20-ØD
SDC16	-	RU25 - SDC16	BN1830F	-	42-46	GER/ER 25-ØD
SDC20	-	RU32 - SDC20	BN2230F	-	48-52	GER/ER 32-ØD
SDC26	-	RU40 - SDC26	BN2838F	-	62-65	GER/ER 40-ØD
SDC34	-	RU50 - SDC34	BN3638F	-	75-79	GER/ER 50-ØD

• NOTES : In case of the RU20 nut, order a 35-38 spanner. In case of the R20 nut, a S-30 spanner.

S-SDC



(mm)

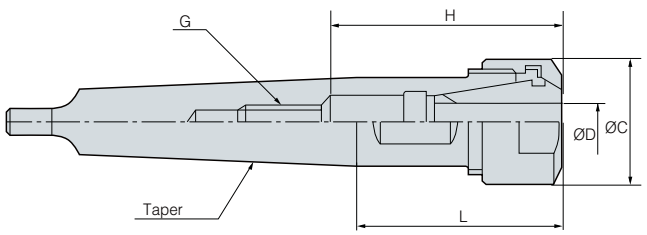
Designation			ØD	Ød	ØC	L	L1	L2	H	Collet / Step	G	kg
S16 -	SDC7 -	120M	1.0~7.0	16	19	120	-	-	33	GER11/0.5	M7	0.2
		120T	1.0~7.0	16	19	120	-	73	33	GER11/0.5	M7	0.2
	SDC10 -	150T	1.0~10.0	16	28	150	46.5	83	34.5	GER16/1.0	M10	0.2
S20 -	SDC10 -	150M	1.0~10.0	20	28	150	26.5	-	34.5	GER16/1.0	M10	0.3
		150T	1.0~10.0	20	28	150	26.5	83	34.5	GER16/1.0	M10	0.3
	SDC13 -	150M	1.0~13.0	20	35	150	50	-	49	GER20/1.0	M13	0.3
		150T	1.0~13.0	20	35	150	50	83	49	GER20/1.0	M13	0.3
S25 -	SDC10 -	150M	1.0~10.0	25	28	150	-	-	34.5	GER16/1.0	M10	0.5
		150T	1.0~10.0	25	28	150	-	83	34.5	GER16/1.0	M10	0.5
	SDC13 -	150M	1.0~13.0	25	35	150	-	-	49	GER20/1.0	M13	0.5
		150T	1.0~13.0	25	35	150	-	83	49	GER20/1.0	M13	0.5
S32 -	SDC13 -	150M	1.0~13.0	32	35	150	-	-	49	GER20/1.0	M13	0.7
		150T	1.0~13.0	32	35	150	-	83	49	GER20/1.0	M13	0.7
	SDC20 -	165M	2.0~20.0	32	50	165	-	-	60	GER32/1.0	M22	0.7
		165T	2.0~20.0	32	50	165	-	83	60	GER32/1.0	M22	0.7

Spare Part I28

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

MT-SDC



(mm)

Designation			ØD	Taper	L	H	G	ØC	kg
MT4 -	SDC20 -	60	2.0~20.0	MT4	60	67	M22	50	1
MT5 -	SDC20 -	60	2.0~20.0	MT5	60	60	M22	60	1.6

Spare Part I28

• Through coolant system is optional. • Order made balanced type available

• Collets in the right size are recommended for oil hole type.

M This is metric size. We can also provide in inch type

S-SDC/S

Fig. 1

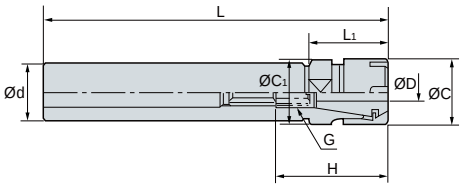
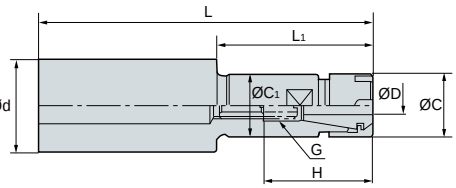


Fig. 2



(mm)

Designation			ØD	Ød	ØC	L	L1	H	Collet/step	G	kg
S16 -	SDC7S -	100M	1.0~7.0	16	16	100	-	33	GER11/0.5	M7	0.2
		150M	1.0~7.0	16	16	150	-	33	GER11/0.5	M7	0.2
	SDC10S -	100M	1.0~10.0	16	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	16	22	150	50	44.5	GER16/1.0	M10	0.3
S20 -	SDC7S -	100M	1.0~7.0	20	16	100	30	35	GER11/0.5	M7	0.3
		150M	1.0~7.0	20	16	150	80	35	GER11/0.5	M7	0.3
	SDC10S -	100M	1.0~10.0	20	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	20	22	150	50	44.5	GER16/1.0	M10	0.3
		200M	1.0~10.0	20	22	200	50	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	20	28	100	50	49	GER20/1.0	M13	0.3
		150M	1.0~13.0	20	28	150	50	49	GER20/1.0	M13	0.3
S25 -	SDC7S -	100M	1.0~7.0	25	16	100	30	33	GER11/0.5	M7	0.4
		150M	1.0~7.0	25	16	150	80	33	GER11/0.5	M7	0.4
	SDC10S -	100M	1.0~10.0	25	22	100	30	44.5	GER16/1.0	M10	0.4
		150M	1.0~10.0	25	22	150	80	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	25	28	100	-	49	GER20/1.0	M13	0.5
		150M	1.0~13.0	25	28	150	-	49	GER20/1.0	M13	0.5
	SDC16S -	100M	1.0~16.0	25	35	100	50	50	GER25/1.0	M18	0.5
		150M	1.0~16.0	25	35	150	50	50	GER25/1.0	M18	0.5
		200M	1.0~16.0	25	35	200	50	50	GER25/1.0	M18	0.7
S32 -	SDC16S -	120M	1.0~16.0	32	35	120	-	50	GER25/1.0	M18	1
		150M	1.0~16.0	32	35	150	-	50	GER25/1.0	M18	1

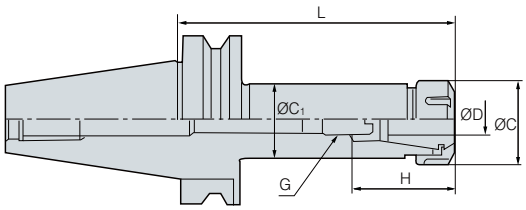
• Through coolant system is optional.

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts			
	Basic		Option	
	Nut	Adjust screw	Spanner	(G)ER Collet
Type				
SDC7S	R11M	BN0716F	M11M	(G)ER 11-ØD
SDC10S	R16M	BN1025F	M16M	(G)ER 16-ØD
SDC13S	R20M	BN1325F	M20M	(G)ER 20-ØD
SDC16S	R25M	BN1830F	M25M	(G)ER 25-ØD

BT-HPS



(mm)

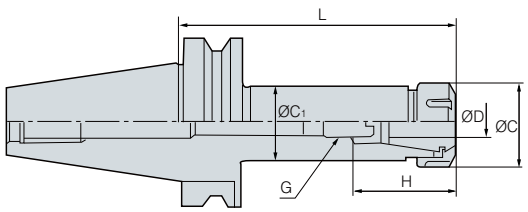
Designation			ØD	L	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT30 -	HPS7 -	50	1.0~7.0	50	33	GER11/0.5	M7	19	19	0.5	15,000
		75	1.0~7.0	75	33	GER11/0.5	M7	19	19	0.5	15,000
		105	1.0~7.0	105	33	GER11/0.5	M7	19	19	0.6	15,000
	HPS10 -	50	1.0~10.0	50	44.5	GER16/1.0	M10	28	28	0.5	15,000
		75	1.0~10.0	75	44.5	GER16/1.0	M10	28	28	0.5	15,000
		105	1.0~10.0	105	44.5	GER16/1.0	M10	28	28	0.6	15,000
	HPS13 -	50	1.0~13.0	50	49	GER20/1.0	M7	35	35	0.5	15,000
		75	1.0~13.0	75	49	GER20/1.0	M13	35	35	0.6	15,000
		105	1.0~13.0	105	49	GER20/1.0	M13	35	35	0.7	15,000
	HPS16 -	50	1.0~16.0	50	50	GER25/1.0	M7	42	42	0.6	15,000
		75	1.0~16.0	75	50	GER25/1.0	M18	42	42	0.7	15,000
		105	1.0~16.0	105	50	GER25/1.0	M18	42	42	0.8	15,000
	HPS20 -	60	1.0~20.0	60	60	GER32/1.0	M7	50	44	0.5	15,000
		90	1.0~20.0	90	60	GER32/1.0	M22	50	44	0.8	15,000
		120	1.0~20.0	120	60	GER32/1.0	M22	50	44	1.0	15,000
BT40 -	HPS7 -	60	1.0~7.0	60	33	GER11/0.5	M7	19	19	1.0	10,000
		90	1.0~7.0	90	33	GER11/0.5	M7	19	19	1.1	10,000
		135	1.0~7.0	135	33	GER11/0.5	M7	19	19	1.2	10,000
	HPS10 -	60	1.0~10.0	60	44.5	GER16/1.0	M10	28	28	1.1	10,000
		90	1.0~10.0	90	44.5	GER16/1.0	M10	28	28	1.2	10,000
		135	1.0~10.0	135	44.5	GER16/1.0	M10	28	28	1.4	10,000
	HPS13 -	60	1.0~13.0	60	49	GER20/1.0	M13	35	35	1.1	10,000
		90	1.0~13.0	90	49	GER20/1.0	M13	35	35	1.3	10,000
		120	1.0~13.0	120	49	GER20/1.0	M13	35	35	1.5	10,000
		150	1.0~13.0	150	49	GER20/1.0	M13	35	35	1.8	10,000
	HPS16 -	60	1.0~16.0	60	50	GER25/1.0	M18	42	42	1.2	10,000
		90	1.0~16.0	90	50	GER25/1.0	M18	42	42	1.4	10,000
		120	1.0~16.0	120	50	GER25/1.0	M18	42	42	1.6	10,000
	HPS20 -	60	1.0~20.0	60	60	GER32/1.0	M7	50	44	1.1	10,000
		90	1.0~20.0	90	60	GER32/1.0	M22	50	44	1.4	10,000
		120	1.0~20.0	120	60	GER32/1.0	M22	50	44	1.7	10,000

Spare Part I30

- Through coolant system is optional.
- Collets in the right size are recommended for oil hole type.

M This is metric size. We can also provide in inch type

BT-HPS



(mm)

Designation			ØD	L	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT50 -	HPS10 -	90	1.0~10.0	90	44.5	GER16/1.0	M10	28	28	3.8	8,000
		120	1.0~10.0	120	44.5	GER16/1.0	M10	28	28	4.0	8,000
		165	1.0~10.0	165	44.5	GER16/1.0	M10	28	28	4.2	8,000
	HPS13 -	105	1.0~13.0	105	49	GER20/1.0	M13	35	35	3.9	8,000
		135	1.0~13.0	135	49	GER20/1.0	M13	35	35	4.1	8,000
		165	1.0~13.0	165	49	GER20/1.0	M13	35	35	4.5	8,000
	HPS16 -	105	1.0~16.0	105	50	GER25/1.0	M18	42	42	4.1	8,000
		165	1.0~16.0	165	50	GER25/1.0	M18	42	42	4.4	8,000
	HPS20 -	75	1.0~20.0	75	60	GER32/1.0	M7	50	44	4.0	8,000
		105	1.0~20.0	105	60	GER32/1.0	M22	50	44	4.3	8,000
		165	1.0~20.0	165	60	GER32/1.0	M22	50	44	5.0	8,000

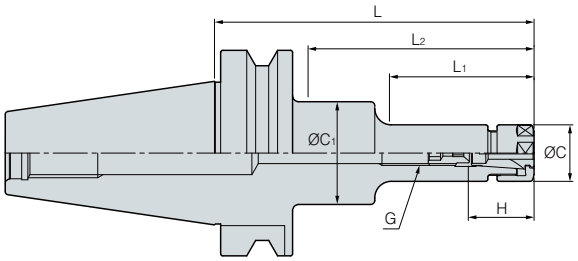
• Through coolant system is optional. • Collets in the right size are recommended for oil hole type.

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts			
	Basic		Option	
	Nut	Adjust screw	Spanner	(G)ER Collet
Type				
HPS7	RN11	BN0716F	20-22	GER 11-ØD
HPS10	RN16	BN1025F	32-35	GER 16-ØD
HPS13	RN20	BN1325F	35-38	GER 20-ØD
HPS16	RN25	BN1830F	42-46	GER 25-ØD
HPS20	RN32	BN2230F	48-52	GER 32-ØD

BT-GSK



(mm)

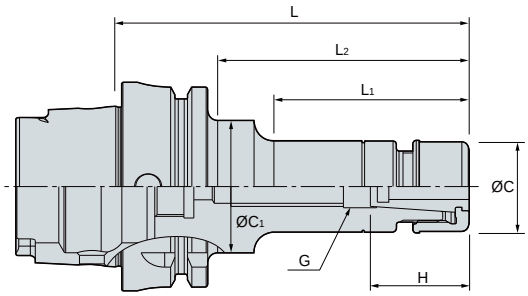
Designation			ØD	L	L1	L2	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT30 -	GSK6 -	60	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	25,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	25,000
	GSK10 -	60	2.0~10.0	60	35	35	50	HC10/0.5	M12	27.5	27.5	0.9	25,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27.5	27.5	1.0	25,000
	GSK13 -	60	3.0~13.0	60	36	36	43	HC13/1.0	M12	33	33	0.6	25,000
	GSK16 -	60	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	25,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	25,000
	GSK25 -	90	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	25,000
BT40 -	GSK6 -	90	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	20,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	20,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	20,000
	GSK10 -	90	2.0~6.0	90	48	60	50	HC10/0.5	M12	27.5	40	1.2	20,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27.5	40	1.4	20,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27.5	34.5	1.6	20,000
	GSK13 -	90	3.0~13.0	90	59	59	43	HC13/1.0	M15	33	33	1.4	20,000
	GSK16 -	90	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	20,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	20,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	20,000
	GSK20 -	90	4.0~20.0	90	60	60	70	HC20/0.5	M22	48	48	1.6	20,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	48	48	2.0	20,000
	GSK25-	90	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	20,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	20,000
BT50 -	GSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	15,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	15,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	15,000
	GSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27.5	27.5	3.8	15,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27.5	32	4.0	15,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27.5	36	4.2	15,000
	GSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	33	33	4.2	15,000
	GSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	15,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	15,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	15,000
	GSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48	40	4.3	15,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48	40	4.6	15,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48	40	5.0	15,000
	GSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	15,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	15,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	15,000

Spare Part I32

- Through coolant system is optional.
- Coolant collets are recommended when using the coolant system.

M This is metric size. We can also provide in inch type

HSK-GSK



(mm)

Designation			ØD	L1	L2	H	Collet / Step	G	ØC	ØC1	MAX RPM
HSK63A -	GSK6 -	100	1.0~6.0	51	61	35	HC6/0.5	M8	19.5	32	20,000
	GSK10 -	105	2.0~6.0	73	118	50	HC10/0.5	M12	27.5	34.5	20,000
	GSK16 -	120	3.0~16.0	58	58	60	HC16/0.5	M18	40	40	20,000
	GSK20 -	120	4.0~20.0	60	60	70	HC20/0.5	M22	48	48	20,000
HSK100A -	GSK6 -	120	1.0~6.0	55	64	35	HC6/0.5	M8	19.5	32	15,000
	GSK10 -	120	2.0~10.0	57	57	50	HC10/0.5	M12	27.5	27.5	15,000
	GSK16 -	140	3.0~16.0	62	62	60	HC16/0.5	M18	40	40	15,000
	GSK25 -	155	16.0~25.0	62	62	85	HC25/0.5	M28	55	55	15,000

• Through coolant system is optional. • Coolant collets are recommended when using the coolant system.

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts		
	Basic		
	Nut	Adjust screw	Extractor
Type			
GSK6	GN6	M820C	GSK-6CE
GSK10	GN10	M1230C	GSK-10CE
GSK13	GN13	BN1530F	GSK-13CE
GSK16	GN16	BN1830F	GSK-16CE
GSK20	GN20	BN2230F	GSK-20CE
GSK25	GN25	BN2838F	GSK-25CE

Spanner(Option)

Spanner

Designation	Type
GSK6 SPANNER	GSK6
GSK10 SPANNER	GSK10
GSK13 SPANNER	GSK13
GSK16 SPANNER	GSK16
GSK20 SPANNER	GSK20
GSK25 SPANNER	GSK25

Head

GSKS06
GSKS10
GSKS13
GSKS16
GSKS20
GSKS25

One-Way Clutch System.
Replace the head to the right size.

Handle

GSKS200HL

Choose the proper length of handle to ease the effort.
(In case of GSK25 : Less than 30kg)

Slim type collet chuck

DSK

- Balancing G6.3 available for machining at max.15,000RPM
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Applicable shank diameter : D1.8~25

Code System

BT30 - DSK 10 - 90

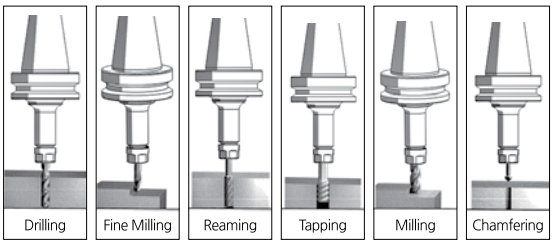
- BT30 — Spindle
- DSK — High Speed Slim Collet Chuck
- 10 — Max. Clampng dia.
- 90 — Length

First-class nut (SWISS Made)

Easy clamping of collet

Special hardening treatment

Multifunctional applications



Collet

Standard type & Precision type	Designation	Arbor	Max Chacking	Run-out
	HC6 - Ød	10.5	6.0	
	HC10 - Ød	15.5	10.0	Standard type 5μm
	HC13 - Ød	20.1	13.0	
	HC16 - Ød	24.6	16.0	Precision type 3μm
	HC20 - Ød	29.1	20.0	
	HC25 - Ød	35.6	25.0	

8° HC collet

Minimized tool vibration during operation

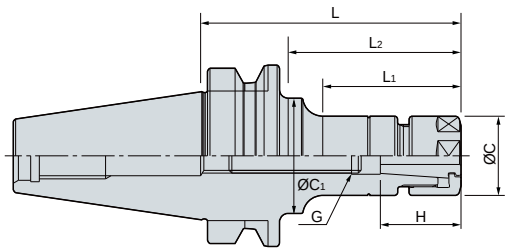
Spanner

	Designation	Chuck
 Spanner	DSS - 6	DSK - 6
	DSS - 10	DSK - 10
	DSS - 16	DSK - 16
	DSS - 20	DSK - 20
	DSS - 25	DSK - 25

	Designation	Chuck
 Collet Extractor	DSS - 6	DSK - 6
	DSS - 10	DSK - 10
	DSS - 16	DSK - 16
	DSS - 20	DSK - 20
	DSS - 25	DSK - 25

M This is metric size. We can also provide in inch type

BT-DSK



(mm)

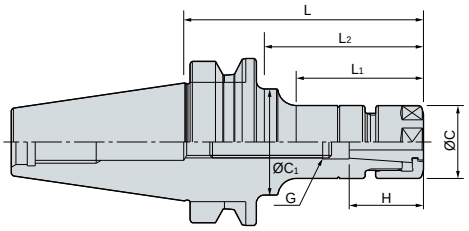
Designation			ØD	L	L1	L2	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT30 -	DSK6 -	60	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	15,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	15,000
	DSK10-	60	2.0~10.0	60	35	35	50	HC10/0.5	M12	27.5	27.5	0.9	15,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27.5	27.5	1.0	15,000
	DSK13 -	60	3.0~13.0	60	36	36	43	HC13/0.5	M12	33	33	0.6	15,000
	DSK16 -	60	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	15,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	15,000
	DSK25 -	90	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	15,000
BT40 -	DSK6 -	90	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	10,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	10,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	10,000
	DSK10 -	90	2.0~6.0	90	48	60	50	HC10/0.5	M12	27.5	40	1.2	10,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27.5	40	1.4	10,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27.5	34.5	1.6	10,000
	DSK13 -	90	3.0~13.0	90	59	59	43	HC13/1.0	M15	33	33	1.4	10,000
	DSK16 -	90	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	10,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	10,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	10,000
	DSK20 -	90	4.0~20.0	90	60	60	70	HC20/0.5	M22	48	48	1.6	10,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	48	48	2.0	10,000
	DSK25 -	90	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	10,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	10,000

Spare Part I35

- Through coolant system is optional.
- Coolant collets are recommended when using the coolant system.

M This is metric size. We can also provide in inch type

BT-DSK



(mm)

Designation			ØD	L	L1	L2	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT50 -	DSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	8,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	8,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	8,000
	DSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27.5	27.5	3.8	8,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27.5	32	4.0	8,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27.5	36	4.2	8,000
	DSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	33	33	4.2	8,000
	DSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	8,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	8,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	8,000
	DSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48	40	4.3	8,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48	40	4.6	8,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48	40	5.0	8,000
	DSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	8,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	8,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	8,000

• Through coolant system is optional.
• Coolant collets are recommended when using the coolant system.

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts		
	Option		
	Nut	Adjust screw	Spanner
Type			
DSK6	DN6	BN0825F	DSS-6
DSK10	DN10	BN1225F	DSS10
DSK16	DN16	BN1830F	DSS16
DSK20	DN20	BN2230F	DSS20
DSK25	DN25	BN2838F	DSS25

GER Collet_GER

GERC New

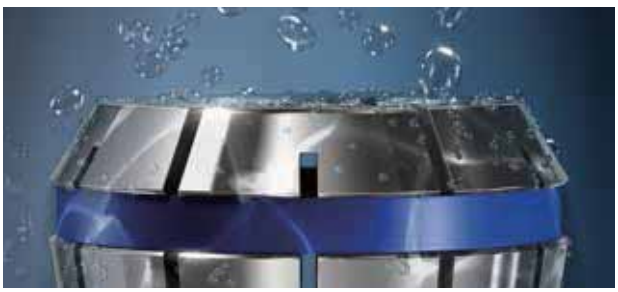
- Corrosion resistant collet to micro unit
- High tech coating for long lasting precision
- Longer tool life and higher productivity

Code System

GERC	-	16	6.0	-	HP
Spindle GER Collet		Clamping Range	HP : Precision Non : General		HP : Precision Non : General

Special coating technology

Unlike GERC collets, Conventional non-coated collets have the following features :
Non-coated collets are affected by corrosion due to high humidity, cutting fluid, cleaner, salt, gas and many other factors, which in result deteriorates whole quality of machining.



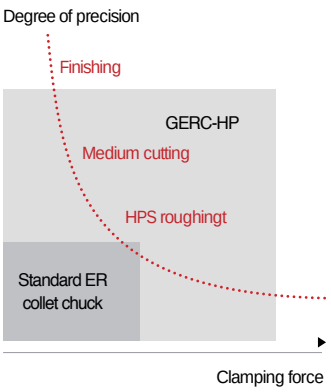
When a collet gets rusty, the tool life is shortened and precision considerably decreases. To prevent this problem, surface treatment by micro unit was applied to GERC collets for effective protection and long lasting precision

Two samples of collets after 4 months of use :
Left : Non-coated, Right : GERC collet

GERC-HP

A precision type collet chuck is expensive than standard one, but still it has more advantages in long term cost and efficiency. Using GERC-HP can minimize pricy reworking due to smaller tolerance with maximum precision.

Precision type collet 2㎛

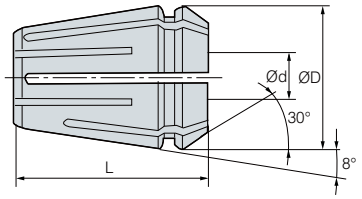


Optimized design

Remaining imbalance is minimized to ensure maximum symmetry and the nut's center is highly accurate due to double guide.

M This is metric size. We can also provide in inch type

GERC Collet (Accuracy type / High Accuracy type)

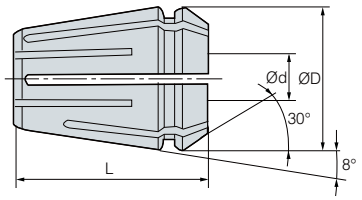


(mm)

Designation	ER Size	ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
						Standard type	Precision type(HP)
GER11 - Ød(HP)	11	11.5	18.0	7.0	0.5	5㎛	2㎛
GER16 - Ød(HP)	16	17.0	27.5	10.0	1.0		
GER20 - Ød(HP)	20	21.0	31.5	13.0	1.0		
GER25 - Ød(HP)	25	26.0	34.0	16.0	1.0		
GER32 - Ød(HP)	32	33.0	40.0	20.0	1.0		
GER40 - Ød(HP)	40	41.0	46.0	26.0	1.0		

M This is metric size. We can also provide in inch type

ER Collet (Trough coolant type)

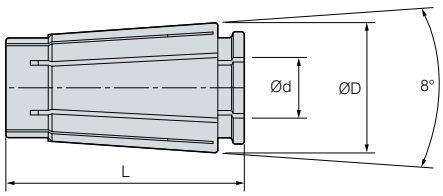


(mm)

Designation	ER Size	ØD	L	Ød (Max.)	Min. pi of water proof type	Distance (mm)	Tolerance
ER11 - Ød	11	11.5	18.0	7.0	-	0.5	10㎛
ER16 - Ød(C)	16	17.0	27.5	10.0	4.0	1.0	
ER20 - Ød(C)	20	21.0	31.5	13.0	6.0	1.0	
ER25 - Ød(C)	25	26.0	34.0	16.0	6.0	1.0	
ER32 - Ød(C)	32	33.0	40.0	20.0	8.0	1.0	
ER40 - Ød(C)	40	41.0	46.0	26.0	10.0	1.0	

M This is metric size. We can also provide in inch type

HC Slim Collet (General & Accuracy type)



(mm)

Designation	ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
					Standard type	Precision type(HP)
HC6 - Ød(P)	10.5	25.0	6.0	1.0	5㎛	3㎛
HC10 - Ød(P)	15.6	30.5	10.0	1.0		
HC13 - Ød(P)	20.1	39.0	13.0	1.0		
HC16 - Ød(P)	24.6	45.0	16.0	1.0		
HC20 - Ød(P)	29.2	54.3	20.0	1.0		
HC25 - Ød(P)	35.7	57.0	25.0	1.0		

M This is metric size. We can also provide in inch type

GERC Collet (Accuracy type)

(mm)

Designation	Ød	Distance	Collet amount	Tolerance
GERC11 1.0 - 7.0mm / 0.5mm	1.0-7.0	0.5	13pcs	5㎛
GERC16 1.0 - 10.0mm / 1.0mm	1.0-10.0	1.0	10pcs	5㎛
GERC20 2.0 - 13.0mm / 1.0mm	2.0-13.0	1.0	12pcs	5㎛
GERC25 2.0 - 16.0mm / 1.0mm	2.0-16.0	1.0	15pcs	5㎛
GERC32 3.0 - 20.0mm / 1.0mm	3.0-20.0	1.0	18pcs	5㎛
GERC40 4.0 - 26.0mm / 1.0mm	4.0-26.0	1.0	23pcs	5㎛

M This is metric size. We can also provide in inch type

ER Collet (General type)

(mm)

Designation	Ød	Distance	Collet amount	Tolerance
ER11(SET)	1.5-7.0	0.5	12pcs	10㎛
ER16(SET)	2.0-10.0	1.0	10pcs	10㎛
ER20(SET)	2.0-13.0	1.0	12pcs	10㎛
ER25(SET)	2.0-16.0	1.0	15pcs	10㎛
ER32(SET)	3.0-20.0	1.0	18pcs	10㎛
ER40(SET)	6.0-26.0	1.0	21pcs	15㎛

M This is metric size. We can also provide in inch type

High speed synchro tapping chuck

DST

New

- Tapping chuck for high speed machining
- Specially designed structure for absorbing thrust load and preventing damage on the tap
- Through coolant system available
- Applicable range : M1-M22

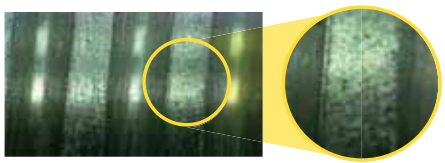
Code System

BT40 - DST 20 - 100

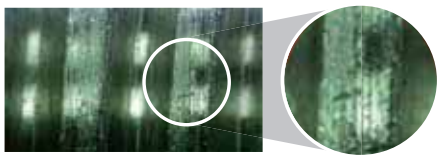
- BT40 — Spindle
- DST — Tapping holder
- 20 — Max. Chucking dia.
- 100 — Length

Excellent performance, precise machining

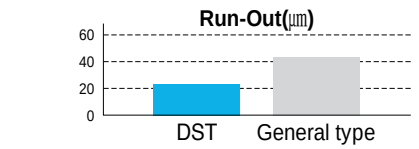
Expanded machining area

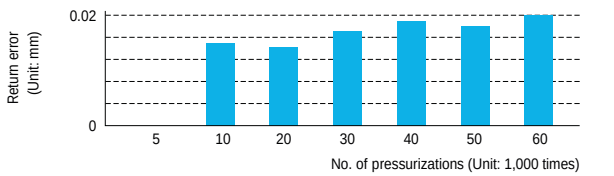


DST20 (vc=100 m/min) — Excellent cutting face



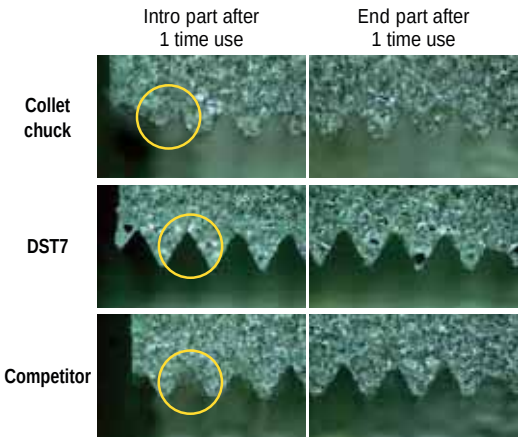
Conventional one

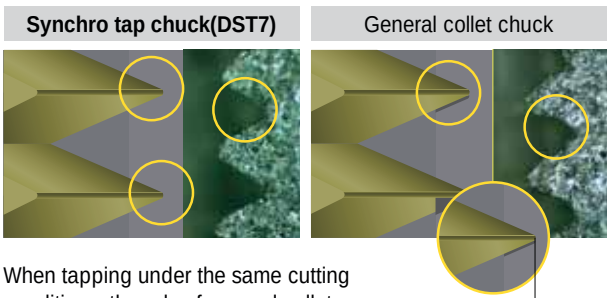




Exclusive collet for tapping
- At tapping work use of TER collet
- DST7:Use of ER11 collet

Comparison of thread figures





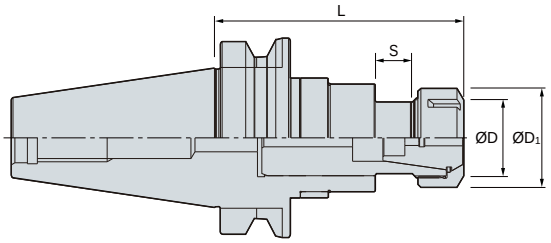
When tapping under the same cutting conditions, threads of general collet chuck seem to be damaged

The tread appears to be out of form due to synchronization error.

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

BT-DST



(mm)

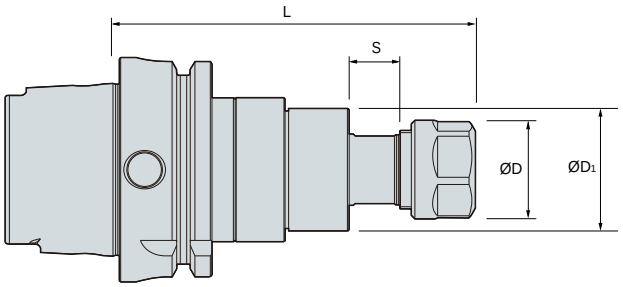
Designation			ØD	ØD1	L	S	Collet	Tapping Range	F-	F+
BT30 -	DST3 -	70	26	19	70	6	ER11	M1~M3	0.5	0.5
	DST10 -	95	40.4	28	95	11	TER16	M3~M10	0.5	0.5
BT40 -	DST10 -	100	40.4	28	100	11	TER16	M3~M10	0.5	0.5
	DST22 -	110	60	49.5	110	18	TER32	M6~M22	0.7	0.7
BT50 -	DST10 -	110	60	49.5	110	11	TER16	M3~M10	0.5	0.5
	DST22 -	130	60	49.5	125	18	TER32	M6~M22	0.7	0.7

Applicable collet **I37, 45**

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

HSK-DST



(mm)

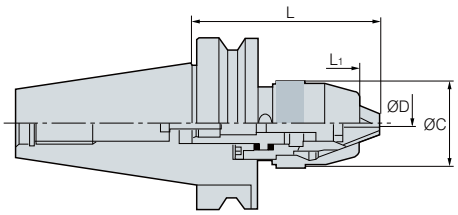
Designation			ØD	ØD1	L	S	Collet	Tapping Range	F-	F+
HSK63A -	**DST10 -**	**100**	40.4	28	100	11	TER16	M3~M10	0.5	0.5
	DST22 -	**130**	60	49.5	130	18	TER32	M6~M22	0.7	0.7

Applicable collet **I45**

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

BT-NPU



(mm)

Designation		ØD (Clamping Range)	ØC	L	L1	kg
BT30 -	NPU8 - 97	0~8	38	97	8.5	0.8
	NPU13 - 125	1~13	50	125	12.5	1.5
BT40 -	NPU8 - 87	0~8	38	87	8.5	1.3
	NPU13 - 105	1~13	50	105	12.5	1.7
	NPU1a3 - 130	1~13	50	130	12.5	2.0
BT50 -	NPU13 - 115	1~13	50	115	12.5	4.4
	NPU13 - 130	1~13	50	130	12.5	4.6
	NPU13 - 190	1~13	50	190	12.5	5.4

• Through coolant system not available

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts		
	Basic		Option
	Chuck	Bolt	Spanner
Type			
NPU08	NPU08	BX0820	NPU0836
NPU13	NPU13	BX0825	NPU1348

Tapping holder

DTN

- Compact design and slim type
- Improvement of tapping force
- Tapping range M3 ~ M38

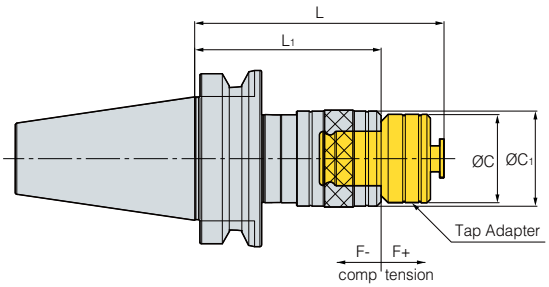
Code System

BT40 - DTN 22 - 130

BT40	DTN	22	130
Spindle	Tapping holder	Max. Chucking dia.	Length

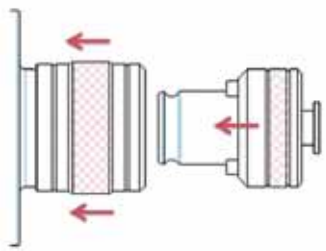
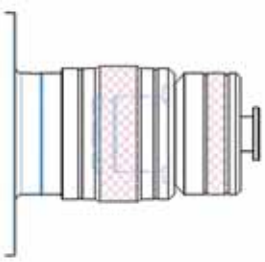
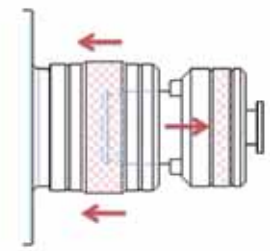
Easy exchange of TCA(Tap adaptor)

Convenient one-touch exchange type for high precision and longer tool life.
Contraction of length is possible by axial floating way.



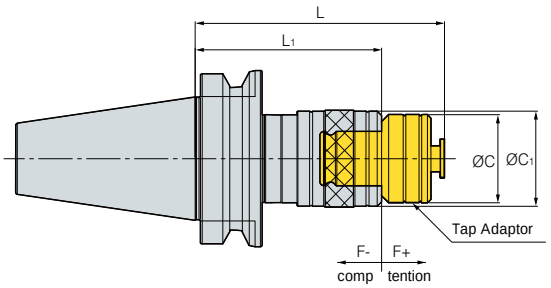
Improved cutting result

How to clamp TCA and a tap holder

Before installation	After installation	Disassembly
		
1. Insert TCA pushing the cover of tap holder 2. Clamp the TCA in the Key groove and firmly	1. The cover of tap holder is placed correctly	1. Seaparate the TCA pushing the cover of tap holder

M This is metric size. We can also provide in inch type

BT-DTN



(mm)

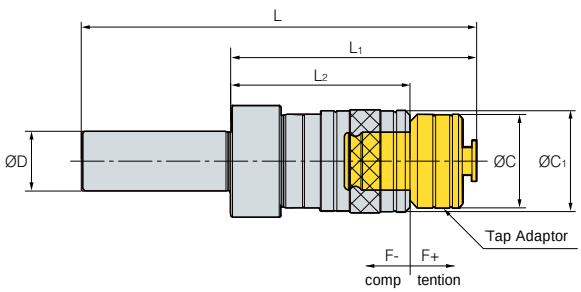
Designation			Tapping Range	L	L1	ØC	ØC1	Tap Adaptor	F-	F+	kg
BT30 -	DTN12 -	85	M3~M12	85	60	32	39	TCA1-M	4	10	0.7
BT40 -	DTN12 -	90	M3~M12	90	65	32	39	TCA1-M	4	10	1.2
		120	M3~M12	120	95	32	39	TCA1-M	4	10	1.4
	DTN22 -	130	M8~M22	130	96	50	56	TCA2-M	12.5	12.5	1.7
		160	M8~M22	160	126	50	56	TCA2-M	12.5	12.5	2.1
BT50 -	DTN12 -	100	M3~M12	100	75	32	39	TCA1-M	4	10	3.7
		130	M3~M12	130	105	32	39	TCA1-M	4	10	3.9
	DTN22 -	140	M8~M22	140	104	50	56	TCA2-M	12.5	12.5	4.2
		170	M8~M22	170	134	50	56	TCA2-M	12.5	12.5	4.7
	DTN38 -	185	M16~M38	185	140	72	81	TCA3-M	20	20	5.7
		215	M16~M38	215	170	72	81	TCA3-M	20	20	6.6

Tap Adapter(TCA) I44

• Through coolant system not available

M This is metric size. We can also provide in inch type

S-DTN



(mm)

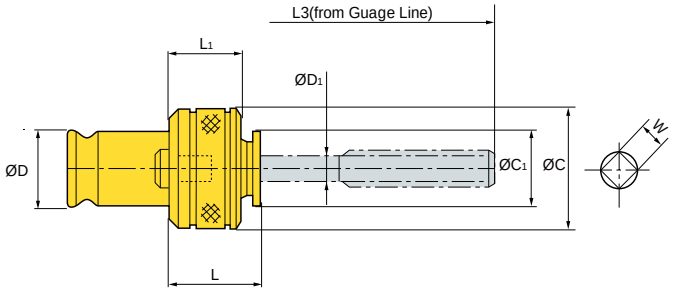
Designation			Tapping Range	ØD	L	L1	L2	ØD	ØD	F-	F+	Tap Adaptor
S32 -	DTN12 -	90	M3-M12	32	170	90	65	32	39	4	10	TCA1
S32 -	DTN22 -	130	M8-M24	32	210	130	96	50	56	12.5	12.5	TCA2

Spare Part I44

• Through coolant system not available

M This is metric size. We can also provide in inch type

TCA Tap Adaptor



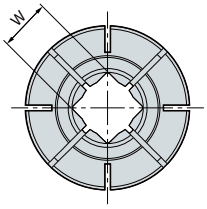
(mm)

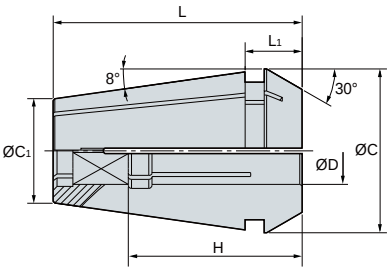
Designation		ØD	ØC	L	L1	kg
TCA1 -	M3	4	3.2	24	22	0.2
	M4	5	4	24	22	0.2
	M5	5.5	4.5	24	22	0.2
	M6, 1/4U	6	4.5	24	22	0.2
	M8	6.2	5	25	22	0.2
	M10, 3/8U	7	5.5	25	22	0.2
	M11	8	6	39	22	0.2
	M12	8.5	6.5	26	22	0.2
TCA2 -	M8	6.2	5	38	28	0.6
TCS2 -	M10	7	5.5	38	28	0.6
TCA2 -	M12	8.5	6.5	39	28	0.6
	M14, 3/4U	10.5	8	41	28	0.6
	P1/4	11	9	31	28	0.6
TCS2 -	M16	12.5	10	43	28	0.6
TCA2 -	M18, P3/8	14	11	44	28	0.6
	M20	15	12	45	28	0.6
	M22	17	13	46	28	0.6
	P1/2	18	14	36	28	0.6
	M24	19	15	46	28	1.8
TCA3 -	M16	12.5	10	35	37	1.8
	M18	14	11	37	37	1.8
	M20	15	12	37	37	1.8
	M22	17	13	38	37	1.8
	M24	19	15	44	37	1.8
	M27, 1U	20	15	62	37	1.8
	M30, P3/4	23	17	62	37	1.8
	M33	25	19	66	37	1.8
	M36, M38	28	21	68	37	1.8

• DIN standard products can be ordered. • Through coolant system not available

M This is metric size. We can also provide in inch type

TER Tap Collet





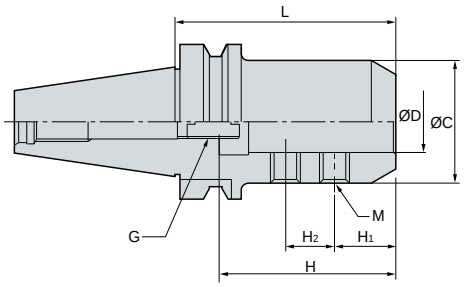
(mm)

Designation		Tapping Range	ØD	W	ØC	ØC1	L	L1	H
TER16 -	4x3.2	M3	4	3.2	16.74	10.1	27.5	6.3	18
	5x4	M4	5	4	16.74	10.1	27.5	6.3	18
	5.5x4.5	M5	5.5	4.5	16.74	10.1	27.5	6.3	18
	6x4.5	M6,U1/4	6	4.5	16.74	10.1	27.5	6.3	18
	6.2x5	M7, M8	6.2	5	16.74	10.1	27.5	6.3	18
	7x5.5	M9, M10, U3/8	7	5.5	16.74	10.1	27.5	6.3	18
TER20 -	5x4	M4	5	4	20.74	13.2	31.5	7.2	18
	5.5x4.5	M5	5.5	4.5	20.74	13.2	31.5	7.2	18
	6x4.5	M6,U1/4	6	4.5	20.74	13.2	31.5	7.2	18
	6.2x5	M7, M8	6.2	5	20.74	13.2	31.5	7.2	18
	7x5.5	M9, M10, U3/8	7	5.5	20.74	13.2	31.5	7.2	18
	8x6	M11, U7/16, P1/8	8	6	20.74	-	-	-	-
	8.5x6.5	M12	8.5	6.5	20.74	13.2	31.5	7.2	22
TER25 -	5x4	M4	5	4	25.74	17.6	34	7.5	18
	5.5x4.5	M5	5.5	4.5	25.74	17.6	34	7.5	18
	6x4.5	M6	6	4.5	25.74	17.6	34	7.5	18
	6.2x5	M7, M8	6.2	5	25.74	17.6	34	7.5	18
	7x5.5	M9, M10, U3/8	7	5.5	25.74	17.6	34	7.5	18
	8.5x6.5	M12	8.5	6.5	25.74	17.6	34	7.5	22
TER32 -	6x4.5	M6,U1/4	6	4.5	32.74	23.1	40	8.2	18
	6.2x5	M7, M8	6.2	5	32.74	23.1	40	8.2	18
	7x5.5	M9, M10, U3/8	7	5.5	32.74	23.1	40	8.2	18
	8X6	M11, U7/16, P1/8	8	6	32.74	23.1	40	8.2	22
	8.5x6.5	M12	8.5	6.5	32.74	23.1	40	8.2	22
	10.5x8	M14, U9/16	10.5	8	32.74	23.1	40	8.2	25
	12.5x10	M16	12.5	10	32.74	23.1	40	8.2	25
	14x11	M18, P3/8	14	11	32.74	23.1	40	8.2	25
	15x12	M20	15	12	32.74	23.1	40	8.2	25
	17x13	M22, U7/8	17	13	32.74	23.1	40	8.2	25
	11x9	P1/4	11	9	32.74	23.1	40	8.2	25
	12x9	U5/8	12	9	32.74	23.1	40	8.2	25
	9x7	U1/2	9	7	32.74	23.1	40	8.2	22

• Water proof tapping is possible with the use of RTJW and nuts (limited to the right sizes)

M This is metric size. We can also provide in inch type

BT-SLA



(mm)

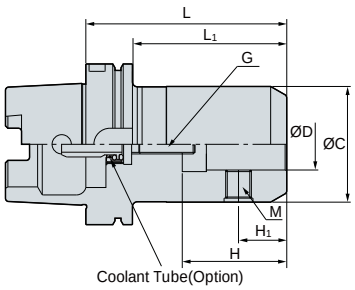
Designation			ØD	L	ØC	H	H1	H2	M	G	kg
BT30 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.1
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.2
	SLA25 -	90	25	90	50	70	25	20	M12	M12	1.2
BT40 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.5
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.8
	SLA25 -	90	25	90	50	70	25	20	M12	M12	2.0
	SLA32 -	90	32	90	60	80	25	25	M14	M12	2.2
		105	32	105	60	80	25	25	M14	M12	2.4
	SLA40 -	105	40	105	80	80	25	25	M16	M12	2.4
BT50 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	4.2
	SLA20 -	105	20	105	50	70	25	20	M12	M12	4.4
	SLA25 -	105	25	105	50	70	25	20	M12	M12	4.4
		135	25	135	50	70	25	20	M12	M12	4.7
	SLA32 -	105	32	105	60	80	25	25	M14	M12	4.8
		135	32	135	60	80	25	25	M14	M12	5.4
		165	32	165	60	80	25	25	M14	M12	6.2
	SLA40 -	105	40	105	90	80	25	25	M16	M12	5.2
		150	40	150	90	80	25	25	M16	M12	5.8
	SLA42 -	105	42	105	90	80	25	25	M16	M12	5.8

Spare Part I47

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

HSK-SLA



(mm)

Designation		ØD	L	ØC	H	H1	M	G	kg
HSK63A -	SLA20 - 100	20	100	52	51	25	M16	M12	2.0
	SLA25 - 105	25	105	65	59	25	M18	M12	2.7
	SLA32 - 105	32	105	72	63	30	M20	M12	2.9
HSK100A -	SLA20 - 105	20	105	52	51	25	M16	M12	3.9
	SLA25 - 110	25	110	65	59	25	M18	M12	4.0
	SLA32 - 125	32	125	72	63	30	M20	M12	4.3

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

Parts

Arbor	Spare Parts				
	Basic			Option	
	Set Screw		Adjust Screw	Wrench	
Type					
	DBT / BT type	HSK / SK type		DBT / BT type	HSK / SK type
SLA16	BTF1010	BTF1414-1.5	M1230C	LW-5	LW-6
SLA19	BTF1212-1.5	BTF1616-1.5		LW-6	LW-8
SLA20					
SLA25		BTF1818-1.5			
SLA32	BTF1414-1.5	BTF2020-1.5		LW-6	LW-10
SLA40	BTF1624-1.5			LW-8	
SLA42					

BT-FMA

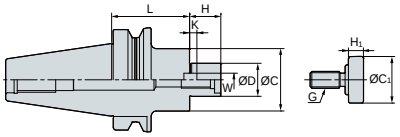


Fig. 1

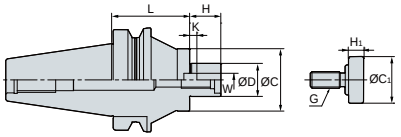


Fig. 2

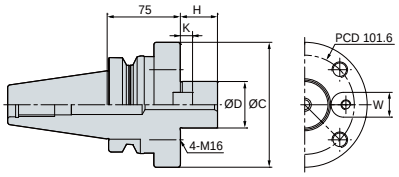


Fig. 3

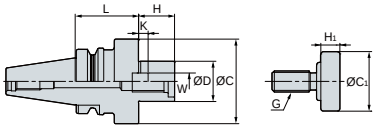


Fig. 4

(mm)

	Designation		Cutter Dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.2	4
BT40 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.4	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	3.1	1
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	1.6	1
	FMA31.75 -	90	100	31.75	90	60	30	12.7	7	M16	3.0	1
	FMA38.1 -	60	125	38.1	60	80	34	15.87	9	M20	2.9	4
BT50 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	3.8	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	4.5	1
	FMA25.4 -	150	80	25.4	150	50	22	9.5	5	M12	5.5	2
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	4.6	1
	FMA31.75 -	75	100	31.75	75	60	30	12.7	7	M16	5.2	1
	FMA31.75 -	105	100	31.75	105	60	30	12.7	7	M16	6.0	2
	FMA38.1 -	45	125	38.1	45	80	34	15.87	9	M20	4.3	1
	FMA38.1 -	75	125	38.1	75	80	34	15.87	9	M20	5.5	1
	FMA50.8 -	45	160	50.8	45	100	36	19.05	10	M24	4.8	1
	FMA50.8 -	75	160	50.8	75	100	36	19.05	10	M24	6.8	1
	FMA47.625 -	75	200	47.625	75	128	38	25.4	12.5	-	7.5	3

• Through coolant system is optional. • The weight above exclude the face cutter.

M This is metric size. We can also provide in inch type

Parts

Arbor	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Key Bolt	Wrench Bolt	Wrench
Type					
FMA22	K8.0	MBA-M10	BX0310	-	LW-8
FMA22.225	K8.0	MBA-M10	BX0310	-	LW-8
FMA25.4	K9.5	MBA-M12	BX0412	BX1230	LW-10
FMA31.75	K12.7	MBA-M16	BX0516	-	LW-14
FMA38.1	K15.87	MBA-M20	BX0616	-	LW-17
FMA50.8	K19.05	MBA-M24	BX0820	-	LW-19
FMA47.625	K25.4	-	BX1020	BX1645	-
S-FMA25.4	-	-	-	-	LW-10
S-FMA31.75	-	-	-	-	LW-14

BT-FMC

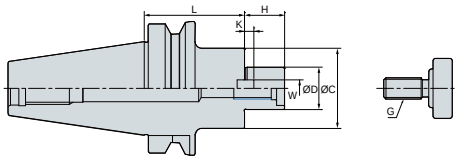


Fig. 1

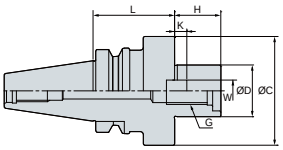


Fig. 2

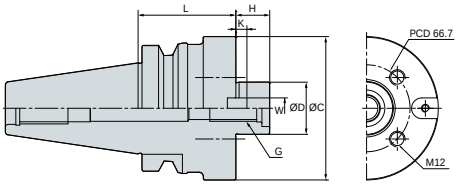


Fig. 3

(mm)

	Designation		Cutter Dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMC16 -	45	40	16	45	38	17	8	5.0	M8	0.7	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	0.8	2
	FMC27 -	50	80	27	50	60	21	12	6.3	M12	1.2	2
BT40 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	1.2	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	1.2	1
	FMC22 -	90	50/63	22	90	48	19	10	5.6	M10	1.2	1
	FMC27 -	60	80	27	60	60	21	12	6.3	M12	1.8	2
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	3.2	2
	FMC32 -	60	100	32	60	78	24	14	7.0	M16	2.3	2
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	3.3	3
BT50 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	3.9	1
	FMC22 -	60	50/63	22	60	48	19	10	5.6	M10	4.1	1
	FMC27 -	40	80	27	40	60	21	12	6.3	M12	4.1	1
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	5.5	1
	FMC27 -	150	80	27	150	60	21	12	6.3	M12	6.1	1
	FMC32 -	45	100	32	45	78	24	14	7.0	M16	4.2	1
	FMC32 -	75	100	32	75	78	24	14	7.0	M16	4.2	1
	FMC32 -	105	100	32	105	78	24	14	7.0	M16	4.2	1
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	4.6	3

• Through coolant system is optional. • The weight above exclude the face cutter.

M This is metric size. We can also provide in inch type

Parts

Arbor	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Key Bolt	Wrench Bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

HSK-FMC

Fig. 1

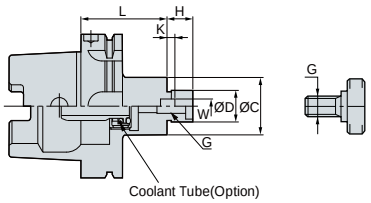


Fig. 2

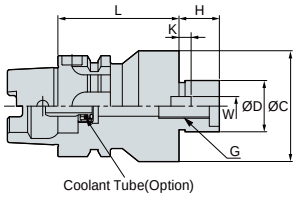
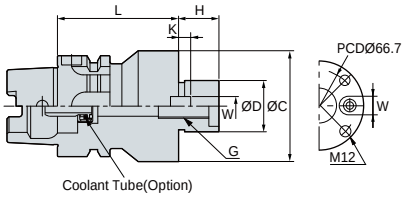


Fig. 3



(mm)

Designation		Cuttter Dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
HSK50A -	FMC16 - 40	40	16	40	38	17	8	5	M8	0.8	1
	FMC22 - 50	50/63	22	50	48	19	10	5.6	M10	0.9	1
HSK63A -	FMC16 - 50	40	16	50	38	17	8	5.0	M8	1.1	1
	FMC22 - 50	50/63	22	50	48	19	10	5.6	M10	1.2	1
	FMC27 - 60	80	27	60	60	21	12	6.3	M12	1.4	1
	FMC32 - 60	100	32	60	78	24	14	7.0	M16	1.8	2
	FMC40 - 60	125/160	40	60	89	27	15.87	8.0	M20	2	3

• Through coolant system is optional. • The weight above exclude the face cutter.

M This is metric size. We can also provide in inch type

Parts

Arbor	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Key Bolt	Wrench Bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

BT-MTA

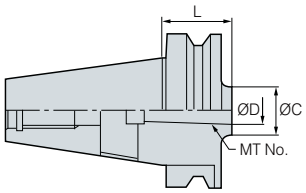


Fig. 1

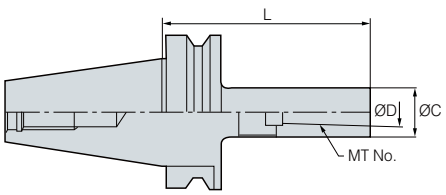


Fig. 2

(mm)

Designation			MT No.	L	ØD	ØC	kg	Fig.
BT40 -	MTA1 -	45	1	45	12.065	25	1.1	1
	MTA2 -	60	2	60	17.780	32	1.1	1
	MTA3 -	75	3	75	23.825	40	1.2	1
	MTA4 -	95	4	95	31.267	50	1.4	1
BT50 -	MTA1 -	45	1	45	12.065	25	3.9	1
	MTA1 -	120	1	120	12.065	25	4.2	2
	MTA1 -	180	1	180	12.065	25	4.3	2
	MTA2 -	45	2	45	17.780	32	3.9	1
	MTA2 -	135	2	135	17.780	32	4.3	2
	MTA2 -	180	2	180	17.780	32	4.6	2
	MTA3 -	45	3	45	23.825	40	3.8	1
	MTA3 -	150	3	150	23.825	40	4.6	2
	MTA3 -	180	3	180	23.825	40	4.9	2
	MTA4 -	75	4	75	31.267	50	3.9	1
	MTA4 -	180	4	180	31.267	50	5.4	2
	MTA5 -	105	5	105	44.399	65	4.5	1

• Through coolant system not available

M This is metric size. We can also provide in inch type

ANGULAR HEAD

ANGULAR HEAD

Features of solid type

- Doubled effect by one equipment
- Available for various angles
- Lighter aluminum body

Code System

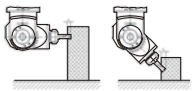
BT50 - KHU 10 - 195

Spindle	Tapping holder	Max. Chucking dia.	Length

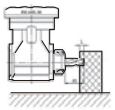
Name of Angular head parts

Various applications

360-degree rotating angular head

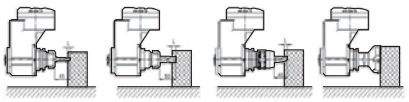


Fixed 90-degree type angular head

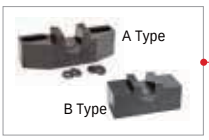


Fixed 45-degree type angular head

Attachment type angular head



Components



Positioning block

Angular head

Part (Basic)

The warranty

Viedo clip CD

M This is metric size. We can also provide in inch type

MAH

Universal type MAH(Reinforced series)

Reinforced type
Better performance by improving existing universal Angular head

1. Stability on large mold machining
2. Use 32mm Ball Endmill
3. Reinforced from KHU type

HRAG

Attachment type HRAG(Reinforced type)

HRAG : The reinforced bracket enhanced durability upto 200%

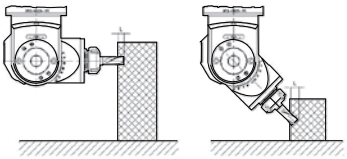
1. Stablility on face milling machining
2. Reinforced stiffness from KAG type.

KHU

Universal type KHU(Freeangle)

Free angle adjusting up to 90°

1. Possible to use various tools of BT40 and BT3(
2. HSK and SK type are order made.
3. Coolant type is optional.



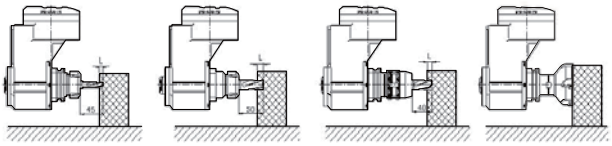
BT50-KHU20-195

KAG

Attachment type KHU(Universal type)

Free 360° angle adjusting from side to side

1. Possible to use various tools of BT40 and BT30
2. HSK and SK type are order made.
3. Coolant type is optional.



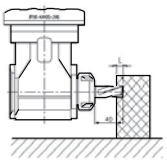
BT40-SDC20-60 (Ø12 E/M)
NT40-SDC20-60 (Ø20 E/M)
BT40-NPM20-85 (Ø20 E/M)
BT40-FMA25.4-45 (Ø80 Shoulder Mill)

KAH

Modular type KHU(90° type)

Free 360° angle adjusting from side to side

1. In case of using a tap collet, please contact us in advance.
2. HSK and SK type are order made.
3. Coolant type is optional.



BT50-KAH20-200

KAC

Modular type KAC(45° type)

Free 360° angle adjusting from side to side

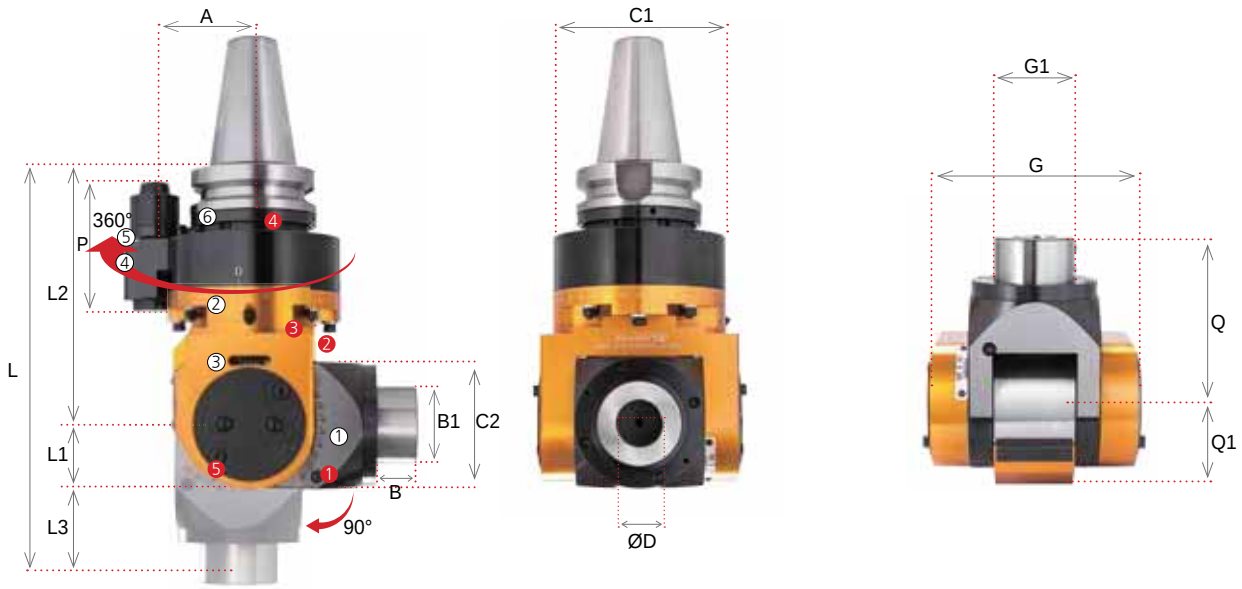
1. HSK and SK type are order made.
2. Coolant type is optional.

M This is metric size. We can also provide in inch type

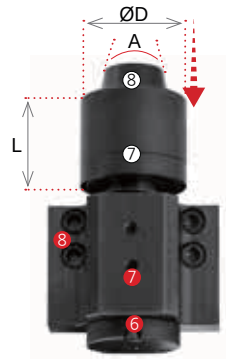
MHA for mold(Free angle)_Reinforced type(0°~90°)

BT-MAH

Side	Front	Head



Positioning pin



Shank Size	L	A	ØD
BT50	56.5	30°	ø40

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Positioning ring
⑦	Positioning pin cover
⑧	Positioning pin

NO	Part name	Designation
1	Inclination angle gradation Screw	BT1216
2	Head fixed bolts	BT0645
3	Rotating angle graduation screw	BT0640
4	Positioning ring set screw	MSST5-12
5	Tilt axies fixing bolts	BH0616
6	Positioning pin height control bolt	BT0516
7	Positioning pin set screw	BT0512
8	Body position block set screw	BX0516

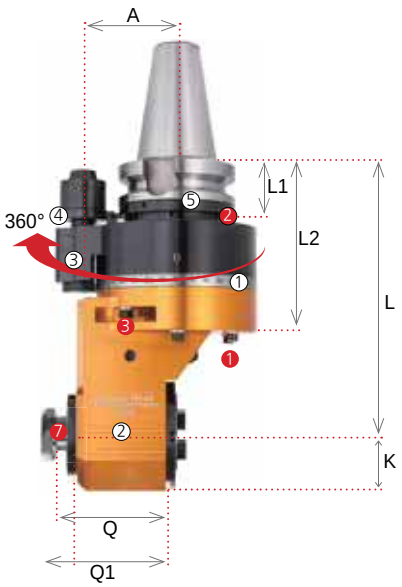
Designation	ØD	L	L1	L2	L3	C	C1	G	C2	Q	Q1	B	B1	P	A	MAX RPM	kg	
BT50-MAH32-200	32	200	47	78	325	136	95	154	95	125	63	31	60	95	80	3,000	19	SIDE LOCK

M This is metric size. We can also provide in inch type

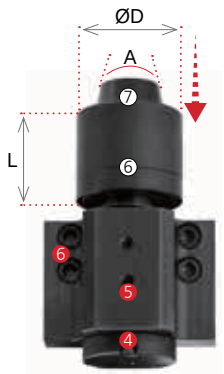
HRAG(90° fixed)_Reinforced type

BT-HRAG

Side	Front	Head



Positioning pin



Shank Size	L	A	ØD
BT50	56.5	30°	ø40

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Positioning ring
⑥	Positioning pin cover
⑦	Positioning pin

NO	Part name	Designation
❶	Head fixed bolts	BX0660
❷	Positioning ring set screw	MSST5-12
❸	Rotating angle graduation screw	BT0648
❹	Positioning pin height control bolt	BT0516
❺	Positioning pin set screw	BT0512
❻	Body position block set screw	BX0516
❼	BT / NT Bolt	

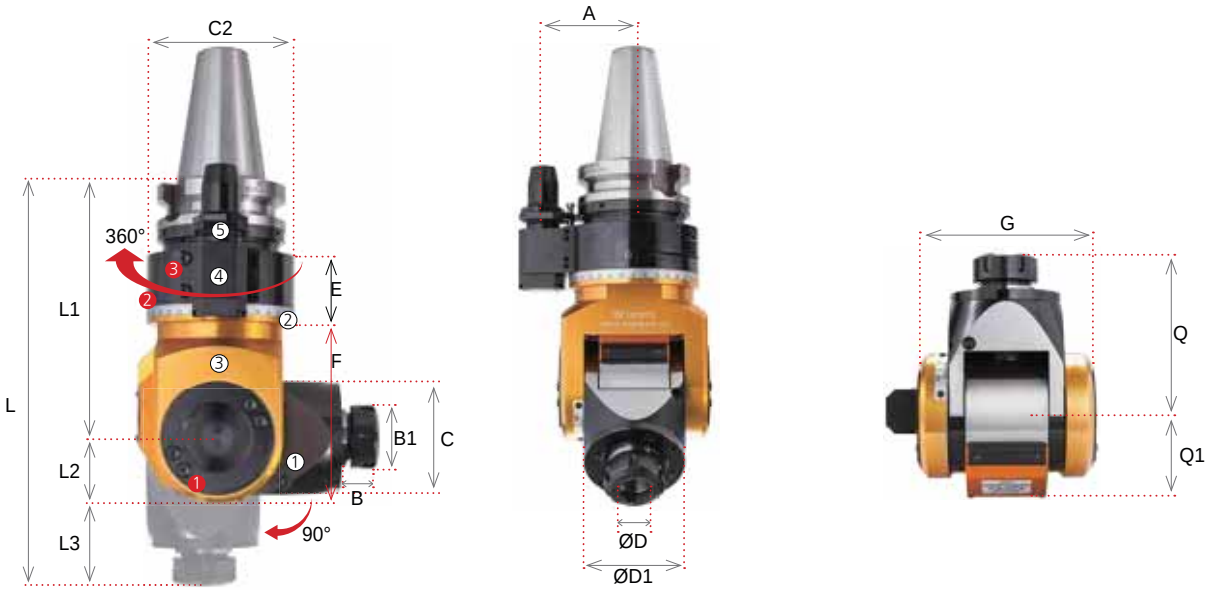
Designation	L	L1	L2	L3	L4	Q	Q1	A	G	G1	MAX RPM	Tool Shank	kg
BT50-HRAG40-230	230	56.5	145	46.5	276.5	89	101	80	93	136	3000	BT40 / NT40	15.75

M This is metric size. We can also provide in inch type

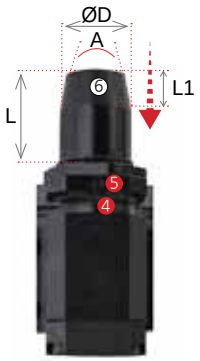
KHU(Free amgle)_Collet type(0°~90°)

BT-KHU

Side	Front	Head



Positioning pin



Shank Size	L	L1	A	ØD
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15		Ø28

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Height control wrench hole

NO	Part name	Designation
❶	Tilt Axies fixing bolts	BH0630
❷	Bracket angle fixing bolt	BX0630
❸	Position block fixing bolt	BX0512
❹	Set screw	BT0404
❺	Fixing bolts	BX05630

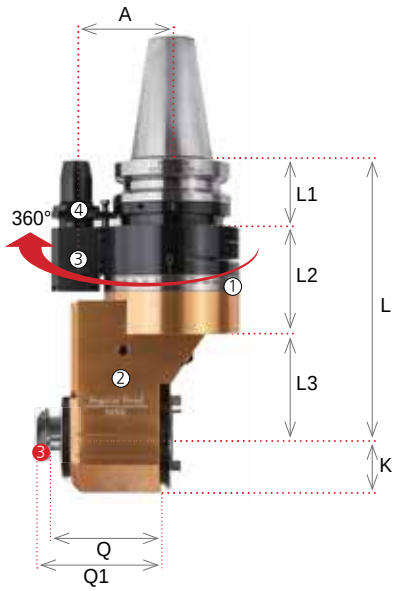
Designation	ØD	ØD1	L	L1	L2	L3	B	B1	E	F	C	A	G	Q	Q1	Torque rate (IN:OUT)	Direction of rotation (IN:OUT)	MAX RPM	Collet	kg
BT40-KHU10-160	1.0~10.0	58	160	33	54	247	22	28	51	98	96	65	90	87	40	1:2	CW:CW	6,000	GERC16	6.4
BT50-KHU10-180	1.0~10.0	58	180	33	54	267	22	28	53	103	114	80	90	87	40	1:2	CW:CW	6,000	GERC16	10.5
BT50-KHU20-195	2.0~20.0	84	195	47	73	315	29	50	53	132	114	80	124	120	63	1:1	CW:CW	3,000	GERC32	15.8

M This is metric size. We can also provide in inch type

KAG(90° Fixed type)

BT-KAG

Side	Front	Head



Positioning pin

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
❶	Set screw	BT0404
❷	Fixing bolts	BX50630
❸	BT / NT Bolt	

Shank Size	L	L1	A	ØD
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15		Ø28

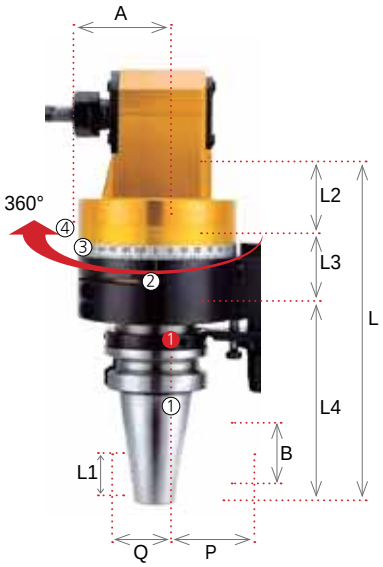
Designation	L1	L2	L3	L4	L5	L6	Q	Q1	A	C	G	Torque rate (IN:OUT)	Direction of rotation (IN:OUT)	MAX RPM	Holder Shank	kg
BT40-KAG30-195	44	86	65	37.5	195	232.5	66	70	65	96	75	1:1	CW:CW	4,000	BT30/NT30	6.4
BT50-KAG40-230	57	88	85	46.5	230	276.5	89	94	80	114	93	1:1	CW:CW	3,000	BT40/NT40	10.5

M This is metric size. We can also provide in inch type

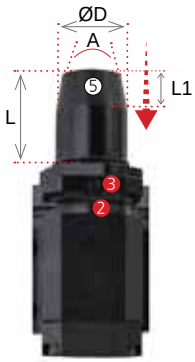
HRAG(90° fixed)_Collet type

BT-KAH

Side	Front	Head



Positioning pin



NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
❶	Head fixing bolts	BX0618
❷	Set screw	BT0404
❸	Fixing bolts	BX50630

Shank Size	L	L1	A	ØD
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15		Ø28

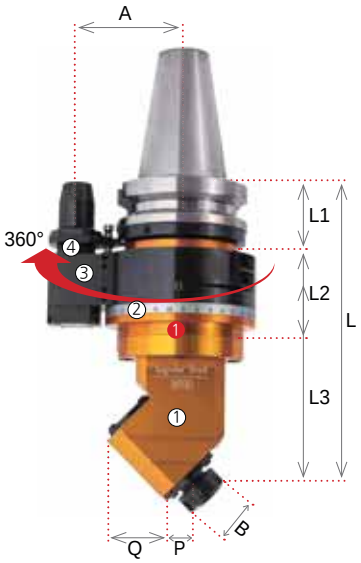
Designation	ØD	L	L1	L2	L3	L4	B	A	P	Q	G	G1	Torque rate (IN:OUT)	MAX RPM	Collet	kg
BT40-KAH7-170	1.0~7.0	170	20	44	71	55	19	65	37	24.5	40	96	1:1	5,000	GERC11	4.6
BT40-KAH10-195	1.0~10.0	195	25	44	71	80	28	65	46	32	58	96	1:1	5,000	GERC16	5.8
BT40-KAH13-165	1.0~13.0	165	28	44	71	50	35	65	53	35	60	96	1:1	5,000	GERC20	5.7
BT40-KAH20-180	2.0~20.0	180	38	44	71	65	50	65	71	49	76	96	1:1	3,500	GERC32	6.7
BT50-KAH07-220	1.0~7.0	220	20	57	54	109	19	80	37	24.5	40	96	1:1	5,000	GERC11	9.8
BT50-KAH10-215	1.0~10.0	215	25	57	54	104	28	80	46	32	58	96	1:1	5,000	GERC16	10.7
BT50-KAH10-260	1.0~10.0	260	25	57	54	149	28	80	46	32	58	96	1:1	5,000	GERC16	11.0
BT50-KAH13-260	1.0~13.0	260	28	57	54	149	35	80	53	35	60	96	1:1	5,000	GERC20	11.2
BT50-KAH20-200	2.0~20.0	200	38	57	54	89	50	80	71	49	76	96	1:1	3,500	GERC32	11.6
BT50-KAH20-240	2.0~20.0	240	38	57	54	129	50	80	71	49	76	96	1:1	3,500	GERC32	12.4

M This is metric size. We can also provide in inch type

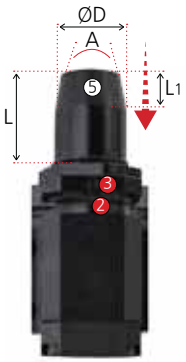
KAC(45° fixed)_Collet type

BT-KAC

Side	Front	Head



Positioning pin



Shank Size	L	L1	A	ØD
BT40	Max : 32 Min : 26	10	20°	Ø19.6
BT50	Max : 35 Min : 29	15		Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BX50630

Designation	ØD	L	L1	L2	L3	B	G	G1	P	Q	A	MAX RPM	Collet	kg
BT40-KAC10-220	1.0~10.0	220	44	71	105	28	60	96	25	54	65	5,000	GERC16	5.3
BT40-KAC13-220	1.0~13.0	220	44	71	105	28	60	96	25	54	65	5,000	GERC20	5.5
BT40-KAC20-230	2.0~20.0	230	44	71	115	50	72	96	30	60	65	3,500	GERC32	6.8
BT50-KAC10-240	1.0~10.0	240	57	54	129	28	60	96	25	54	80	5,000	GERC16	10.2
BT50-KAC13-240	1.0~13.0	240	57	54	129	28	60	96	25	54	80	5,000	GERC20	10.4
BT50-KAC20-250	2.0~20.0	250	57	54	139	50	72	96	30	60	80	3,500	GERC32	11.7

M This is metric size. We can also provide in inch type

FBH back boring & balanced type

FBH

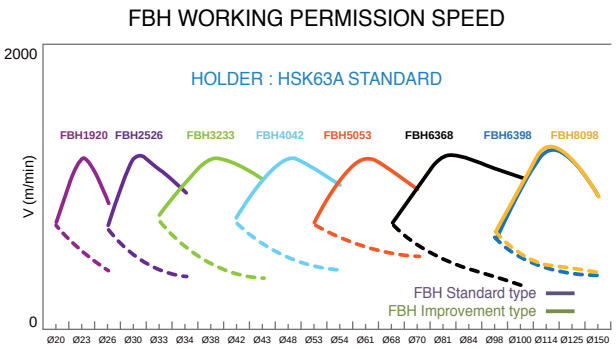
- High speed machining : G2.5
- Back Boring funtion
- Adjustment range: 1DIV=0.002mm

Code System

BT50 - FBH 32 - 33 B

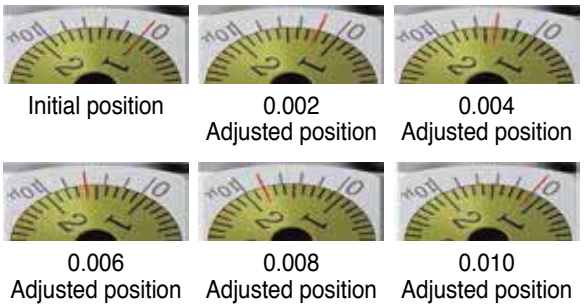
BT50	FBH	32	33	B
Spindle	Fine boring head	MD ND	Boring rage	Balance Type

Working Permission Speed



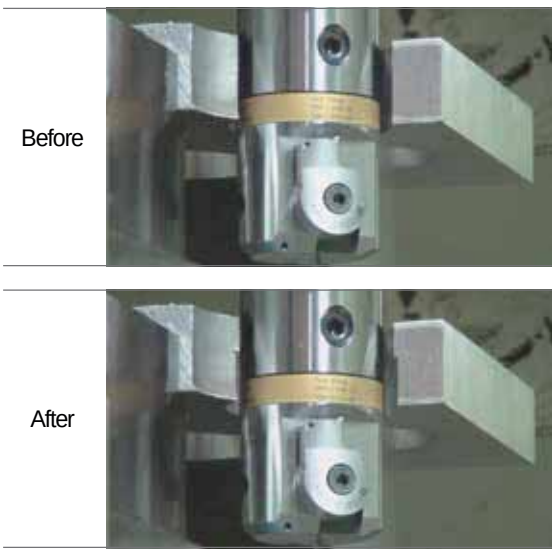
Boring range adjustment method

2㎛ boring range



Initial position	0.002 Adjusted position	0.004 Adjusted position
0.006 Adjusted position	0.008 Adjusted position	0.010 Adjusted position

Back boring



Adjusting machining direction available

By forward machining By reverse machining

Easy change of machining direction
only by adjusting the bite

M This is metric size. We can also provide in inch type

BT-FBHB Micro Boring Balance Type

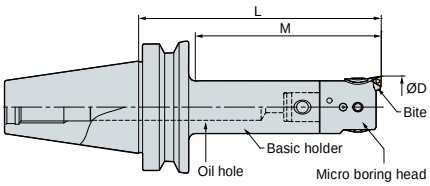


Fig. 1

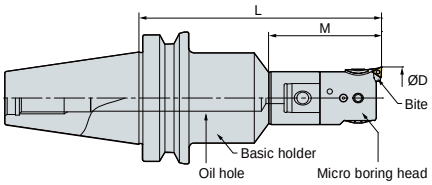


Fig. 2

(mm)

Designation				Boring Range ØD		L	Max. Boring Depth	kg	Fig.
Micro Boring Head	Bite	Body (Basic Holder)		Min	Max				
FBH1920B	FBB20N-□-□□	BT30 -	MD19F - 70R	20(24)	26(30)	103	60	0.5	2
FBH2526B	FBB26N-□-□□		MD25F - 90R	26(32)	34(40)	127	80	0.7	2
FBH3233B	FBB33N-□-□□		MD32F - 80R	33(40)	43(50)	121	80	0.8	2
FBH4042B	FBB42N-□-□□		MD40F - 80R	42(50)	54(62)	127	96	1.1	2
FBH5053B	FBB53N-□-□□		MD50F - 70	53(65)	70(82)	127	97	1.7	1
FBH1920B	FBB20N-□-□□	BT40 -	MD19F - 70R	20(24)	26(30)	103	45	1.9	2
FBH2526B	FBB26N-□-□□		MD25F - 95R	26(32)	34(40)	133	59	2	2
FBH3233B	FBB33N-□-□□		MD32F - 100R	33(40)	43(50)	141	77	2.5	2
FBH4042B	FBB42N-□-□□		MD40F - 115R	42(50)	54(62)	162	107	3.1	2
FBH5053B	FBB53N-□-□□		MD50F - 105	53(65)	70(82)	162	135	3.5	1
FBH6368B	FBB68N-□-□□		MD63F - 110	68(90)	100(122)	181	154	6.3	1
FBH6398B	FBB68N-□-□□		MD63F - 135	98(120)	150(172)	206	179	7.1	1
FBH8098B	FBB68N-□-□□		MD80F - 100	98(120)	150(172)	171	144	8.3	1
FBH1920B	FBB20N-□-□□	BT50 -	MD19F - 85	20(24)	26(30)	118	80	5.2	1
FBH2526B	FBB26N-□-□□		MD25F - 105R	26(32)	34(40)	142	59	5.8	2
FBH3233B	FBB33N-□-□□		MD32F - 110R	33(40)	43(50)	151	77	6	2
FBH4042B	FBB42N-□-□□		MD40F - 195R	42(50)	54(62)	242	130	6.3	2
FBH5053B	FBB53N-□-□□		MD50F - 225R	53(65)	70(82)	282	182	6.6	2
FBH6368B	FBB68N-□-□□		MD63F - 230R	68(90)	100(122)	301	220	7.2	2
FBH6398B	FBB68N-□-□□		MD63F - 195R	98(120)	150(172)	266	191	8.5	2
FBH8098B	FBB68N-□-□□		MD80F - 175	98(120)	150(172)	246	208	12.8	1

Spare Part I63

• Through coolant system available

M This is metric size. We can also provide in inch type

FBH Micro Boring Head

FBH1920B

New Type

(mm)

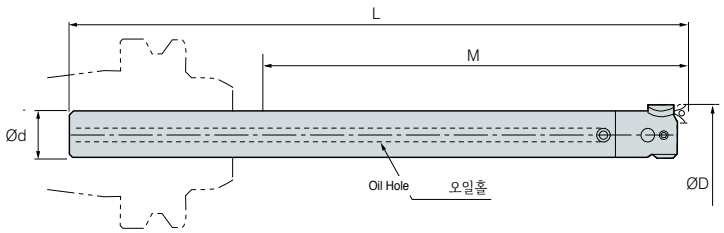
Designation		Boring Range ØD		L	Scale Ring 1Rev. Adjustable range	MD No.	kg
		Min	Max				
FBH -	1920B	20	26(30)	33	Ø0.4mm	MD1911	0.06
	2526B	26	34(40)	37	Ø0.4mm	MD2514	0.12
	3233B	33	43(50)	41	Ø0.5mm	MD3218	0.24
	4042B	42	54(62)	47	Ø0.5mm	MD4022	0.41
	5053B	53	70(82)	57	Ø0.6mm	MD5028	0.8
	6368B	68	100(122)	71	Ø0.8mm	MD6336	1.7
	6398B	98	150(172)	71	Ø0.8mm	MD6336	2.35

• Stock of basic holders, heads and bites are separately managed.

• ( ) : Max. boring diameter of extension type

M This is metric size. We can also provide in inch type

S-FBH Small Micro Boring



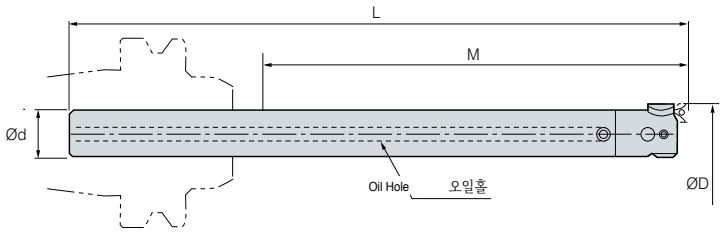
(mm)

Designation			Shank dia ød	Boring Range øD		L	M	Designation			kg
				Min	Max			Basic Shank	Boring Head	Bite	
S19W -	FBH20B -	120	19	20	26	190	120	S19W-MD19F-157	FBH1920B	FBB20N	0.6
		140	19	20	26	210	140	S19W-MD19F-177	FBH1920B	FBB20N	0.7
		160	19	20	26	230	160	S19W-MD19F-197	FBH1920B	FBB20N	0.8
S25W -	FBH26B -	150	25	26	34	235	150	S25W-MD25F-197.5	FBH2526B	FBB26N	1.4
		175	25	26	34	260	175	S25W-MD25F-222.5	FBH2526B	FBB26N	1.6
		200	25	26	34	285	200	S25W-MD25F-247.5	FBH2526B	FBB26N	2
S32W -	FBH33B -	180	32	33	43	280	180	S32W-MD32F-239	FBH3233B	FBB33N	2.8
		240	32	33	43	340	240	S32W-MD32F-299	FBH3233B	FBB33N	3.5
S19 -	FBH20B -	40	19	20	26	110	40	S19-MD19F-77	FBH1920B	FBB20N	0.1
		80	19	20	26	150	80	S19-MD19F-117	FBH1920B	FBB20N	0.2
S25 -	FBH26B -	50	25	26	34	135	50	S25-MD25F-97.5	FBH2526B	FBB26N	0.4
		100	25	26	34	185	100	S25-MD25F-147.5	FBH2526B	FBB26N	0.6
S32 -	FBH33B -	90	32	33	43	190	90	S32-MD32F-149	FBH3233B	FBB33N	1.1
		120	32	33	43	220	120	S32-MD32F-179	FBH3233B	FBB33N	1.2

• Through coolant system available

M This is metric size. We can also provide in inch type

S-FBH Mini Small Micro Boring



(mm)

Designation			Shank dia ød	Boring Range øD		L	M	Designation			kg
				Min	Max			Basic Shank	Boring Head	Bite	
S14W	FBH15 -	85	14	15	18	155	85	S14W-M6-123	FBH15	FBB15-C	0.2
		110	14	15	18	180	110	S14W-M6-148	FBH15	FBB15-C	0.3
S16W	FBH18 -	95	16	18	22	165	95	S16W-M8-128	FBH18	FBB15-C	0.3
		125	16	18	22	195	120	S16W-M8-158	FBH18	FBB15-C	0.4
S14	FBH15 -	40	14	15	18	110	40	S14-M6-78	FBH15	FBB15-C	0.1
S16	FBH18 -	45	16	18	22	115	45	S16-M8-78	FBH18	FBB15-C	0.1

• Through coolant system available

M This is metric size. We can also provide in inch type

Parts

Spare Parts		
Type(FBH)	Lock Screw	Clamp Screw
FBH1920B	BTF0404	BXC0304
FBH2526B	BTF0505	BXC0405
FBH3233B	BTF0606	BXC0506
FBH4042B	BTF0808	BXC0610
FBH5053B	BTF0812	BXC0610
FBH6368B	BTF1016	BXC0810
FBH6398B	BTF1012	BXC0810
FBH8098B	BTF1014	BXC0810

FBB Bite (New Type)

Designation	Boring Range	Insert Screw	Clamp Bolt
FBB15-C	Ø15 ~ Ø18mm	FTNA01633	BFTX02506N
	Ø18 ~ Ø22mm		
FBB20N	Ø20 ~ Ø26mm	BFTX0204A	BXC0304
FBB20N	Ø20 ~ Ø26mm	-	
FBB20N	-	1	
FBB20N	-	-	
FBB26N	Ø26 ~ Ø34mm	BFTX0204A	BXC0405
FBB26N		-	
FBB26N	-	1	
FBB26N	-	-	
FBB33N	Ø33 ~ Ø43mm	BFTX0204A	BXC0506
FBB33N		-	
FBB33N	-	1	
FBB33N		-	
FBB42N	Ø42~ Ø54mm	BFTX0204A	BXC0610
FBB42N	Ø42~ Ø54mm	-	
FBB42N	Ø42~ Ø54mm	-	
FBB42N	-	1	
FBB42N	-	-	
FBB42N	-	-	
FBB53N	Ø53~ Ø70mm	BFTX0204A	
FBB53N		-	
FBB53N		-	
FBB53N		-	
FBB53N	-	1	
FBB53N		-	
FBB53N		-	
FBB53N		-	
FBB68N	Ø68~ Ø100mm Ø98~ Ø150mm	BFTX0204A	BXC0810
FBB68N		-	
FBB68N		-	
FBB68N	-	1	
FBB68N		-	
FBB68N		-	

M This is metric size. We can also provide in inch type

Balance cut tool for Rough boring

TBC

- Wide boring range for big diameters - Ø130 ~ Ø540mm
- Stable structure against for cutting load - Assembly by dove-tail structure
- Interconvert with FBC
  - Common boring head and rail adopted, different cartridge
- Light-weight (5%~20% reduced)
- Various cartridge approach angle - 15°, 45°
- Internal coolant pin - Easy assembly - Spray coolant to 6 directions

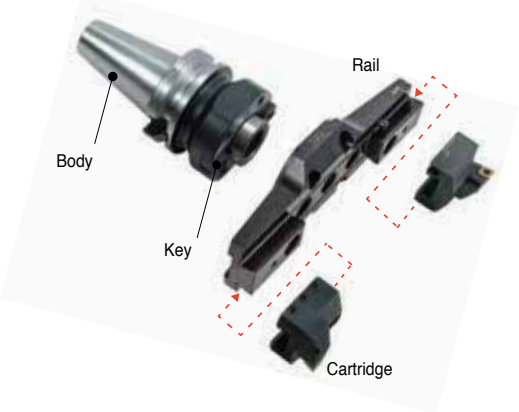
Code System

BT50 – TBC 50 – 85 + TBR130 – BCC1348 + CCMT1204 □□

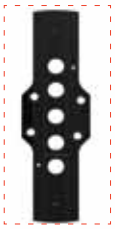
Spindle	Blaance cut tool for finish boring	Max. Chucking dia.	Length	Rail	Cartridge	Insert

TBC Boring Tool structure & Features

TBC Compositions



Cartridge : BCC1348
Incert : CCMT1204□□
CNMG1204□□



Less Weight and more margin for Chip evacuation

Enhanced Strength and Weight

TBC Boring Tool Cutting condition

Work-piece	Grade(HRC)	Cutting condition		
		Tip (Grade)	Cutting Speed (m/min.)	Feed per Revolution f(mm/rev.)
ALL	ADC12	"N"Material	"N"Material	0.1
Mild steel	SS41(HB160)	P Material	P Material	0.1
Steel	S45C(H250)	P Material	P Material	0.1
Stainless Steel	SUS304	M Material	M Material	0.1
Cast-rion	FC25(HB250)	K Material	K Material	0.1

Boring range

Grade	Dia(Ø)		Body	Head Set	Insert
	min	max			
TBC130	130	180	FMD50	TBC130S	CCMT1204□□
TBC175	175	225	FMD50	TBC175S	CCMT1204□□
TBC220	220	270	FMD50	TBC220S	CCMT1204□□
TBC265	265	315	FMD50	TBC265S	CCMT1204□□
TBC310	310	390	FMD50	TBC310S	CCMT1204□□
TBC385	385	465	FMD50	TBC385S	CCMT1204□□
TBC460	460	540	FMD50	TBC460S	CCMT1204□□

M This is metric size. We can also provide in inch type

Balance cut tool for Fine boring

FBC

- Wide boring range for big diameters - Ø130 ~ Ø540mm
- Interconvert with TBC
  - Common boring head and rail adopted, different cartridge [micro cartridge + balancing block]
- Various Insert according to bite
  - Applicable insert : CCMT09T3/1204, TPMT1103 (Cermet, cBN, PCD)

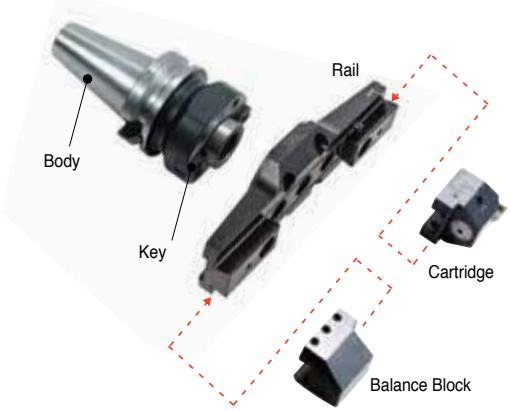
Code System

BT50 – FBC 50 – 85 + TBR130 – BCC1348 + CCMT1204 □□

Spindle	Blaance cut tool for finish boring	Max. Chucking dia.	Length	Rail	Cartridge	Insert

FBC Boring Tool structure & Features

FBC Compositions



Cartridge
FCC130

Balance Block
FCB130

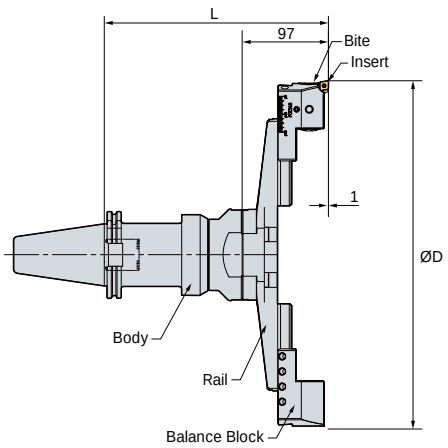
Incert
CCGT09T3□□
CCMT1204□□
TPGT1103□□

FBC Boring Tool Cutting condition

Grade	Dia(Ø)		Head Set	Insert
	min	max		
FBC130	130	180	FBC130S(TBR130+FCC130+FCB130)	FBB130-C09 (CCMT09T3□□, CCGT09T3□□ FBB130-C12 (CCMT1204□□) FBB130-T11 (TPMT1103□□,TPGT1103□□L)
FBC175	175	225	FBC175S(TBR175+FCC130+FCB130)	
FBC220	220	270	FBC220S(TBR220+FCC130+FCB130)	
FBC265	265	315	FBC265S(TBR265+FCC130+FCB130)	
FBC310	310	390	FBC310S(TBR310+FCC310+FCB310)	
FBC385	385	465	FBC385S(TBR385+FCC310+FCB310)	
FBC460	460	540	FBC460S(TBR460+FCC310+FCB310)	

M This is metric size. We can also provide in inch type

TBC, FBC



(mm)

Body				Designation						Boring Range	
				Rough Boring (TBC)			Finish Boring (FBC)				
			kg	TBC HEAD SET (Rail+Cartridge)	L	kg	FBC HEAD SET (Rail+Cartridge+Balance Block)	L	kg	Min	Max
BT50 -	FMD50 -	85	5.9	TBC130S(TBR130+BCC1348)	175	3.5	FBC130S(TBR130+FCC130+FCB130)	182	3.8	130	180
		155	7.9	TBC130S(TBR130+BCC1348)	245	3.5	FBC130S(TBR130+FCC130+FCB130)	252	3.8	130	180
		205	9.7	TBC130S(TBR130+BCC1348)	295	3.5	FBC130S(TBR130+FCC130+FCB130)	302	3.8	130	180
		255	10.4	TBC130S(TBR130+BCC1348)	345	3.5	FBC130S(TBR130+FCC130+FCB130)	352	3.8	130	180
		85	5.9	TBC175S(TBR175+BCC1348)	175	3.9	FBC175S(TBR175+FCC130+FCB130)	182	4.1	175	225
		155	7.9	TBC175S(TBR175+BCC1348)	245	3.9	FBC175S(TBR175+FCC130+FCB130)	252	4.1	175	225
		205	9.7	TBC175S(TBR175+BCC1348)	295	3.9	FBC175S(TBR175+FCC130+FCB130)	302	4.1	175	225
		255	10.4	TBC175S(TBR175+BCC1348)	345	3.9	FBC175S(TBR175+FCC130+FCB130)	352	4.1	175	225
		85	5.9	TBC220S(TBR220+BCC1348)	175	4.3	FBC220S(TBR220+FCC130+FCB130)	182	4.5	220	270
		155	7.9	TBC220S(TBR220+BCC1348)	245	4.3	FBC220S(TBR220+FCC130+FCB130)	252	4.5	220	270
		205	9.7	TBC220S(TBR220+BCC1348)	295	4.3	FBC220S(TBR220+FCC130+FCB130)	302	4.5	220	270
		255	10.4	TBC220S(TBR220+BCC1348)	345	4.3	FBC220S(TBR220+FCC130+FCB130)	352	4.5	220	270
		85	5.9	TBC265S(TBR265+BCC1348)	175	4.5	FBC265S(TBR265+FCC130+FCB130)	182	4.6	265	315
		155	7.9	TBC265S(TBR265+BCC1348)	245	4.5	FBC265S(TBR265+FCC130+FCB130)	252	4.6	265	315
		205	9.7	TBC265S(TBR265+BCC1348)	295	4.5	FBC265S(TBR265+FCC130+FCB130)	302	4.6	265	315
		255	10.4	TBC265S(TBR265+BCC1348)	345	4.5	FBC265S(TBR265+FCC130+FCB130)	352	4.6	265	315
		85	5.9	TBC310S(TBR310+BCC1354)	175	5.5	FBC310S(TBR310+FCC130+FCB130)	182	5.5	310	390
		155	7.9	TBC310S(TBR310+BCC1354)	245	5.5	FBC310S(TBR310+FCC130+FCB130)	252	5.5	310	390
		205	9.7	TBC310S(TBR310+BCC1354)	295	5.5	FBC310S(TBR310+FCC130+FCB130)	302	5.5	310	390
		255	10.4	TBC310S(TBR310+BCC1354)	345	5.5	FBC310S(TBR310+FCC130+FCB130)	352	5.5	310	390
		85	5.9	TBC385S(TBR385+BCC1354)	175	5.8	FBC385S(TBR385+FCC130+FCB130)	182	5.8	385	465
		155	7.9	TBC385S(TBR385+BCC1354)	245	5.8	FBC385S(TBR385+FCC130+FCB130)	252	5.8	385	465
		205	9.7	TBC385S(TBR385+BCC1354)	295	5.8	FBC385S(TBR385+FCC130+FCB130)	302	5.8	385	465
		255	10.4	TBC385S(TBR385+BCC1354)	345	5.8	FBC385S(TBR385+FCC130+FCB130)	352	5.8	385	465
		85	5.9	TBC460S(TBR460+BCC1354)	175	12.8	FBC460S(TBR460+FCC130+FCB130)	182	12.8	460	540
		155	7.9	TBC460S(TBR460+BCC1354)	245	12.8	FBC460S(TBR460+FCC130+FCB130)	252	12.8	460	540
		205	9.7	TBC460S(TBR460+BCC1354)	295	12.8	FBC460S(TBR460+FCC130+FCB130)	302	12.8	460	540
		255	10.4	TBC460S(TBR460+BCC1354)	345	12.8	FBC460S(TBR460+FCC130+FCB130)	352	12.8	460	540

M This is metric size. We can also provide in inch type

FBB FBB Bite

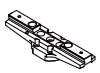
(mm)

Designation		Insert
FBB130 -	C09	CCMT09T3□□, CCGT09T3□□
	C12	CCMT1204□□
	T11	TPMT1103□□, TPGT1103□□

• TBC and DBC cartridges with tip angle of 15° / 45° can be purchased by order. (45° basis)

M This is metric size. We can also provide in inch type

Parts

Arbor	Spare Parts								
	Basic								
	Rail	Cartridge	Cartridge	Clamp Bolt	Clamp Bolt	Balance Block	Wrench	Clamp Screw	Torx Wrench
Type									
TBC130S	TBR130	BCC1348	-	BX0820	BT0645	-	LW-3	BFTX0511N	TW20
TBC175S	TBR175								
TBC220S	TBR220								
TBC265S	TBR265								
TBC310S	TBR310	BCC1354 (BCN1354)			BT0660				
TBC385S	TBR385								
TBC460S	TBR460								
FBC130S	TBR130	-	FCC130		BT0645	FCB130	LW-3	-	-
FBC175S	TBR175								
FBC220S	TBR220								
FBC265S	TBR265								
FBC310S	TBR310		FCC310		BT0660	FCB310			
FBC385S	TBR385								
FBC460S	TBR460								

BT-DBC

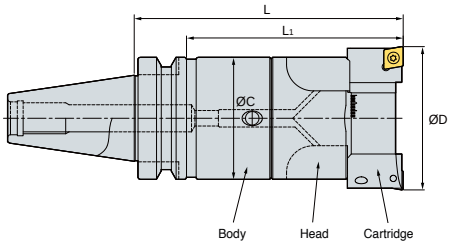


Fig. 1

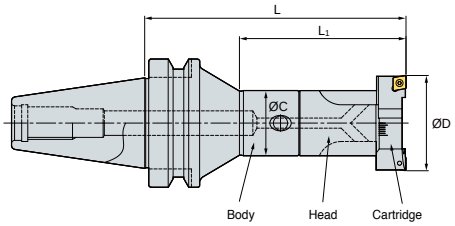


Fig. 2

(mm)

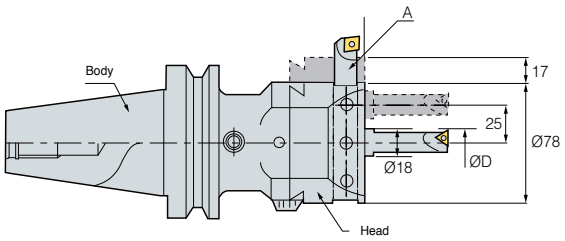
Designation				Boring Range ØD		L	Max. Boring Depth	Fig.
Micro Boring Head	kg	Body (Basic Holder)	kg	Min	Max			
DBC2528S	0.3	BT30-MD25F-90R	0.4	28	35	140	93	2
DBC3235S	0.4	BT30-MD32F-80R	0.4	35	46	145	114	2
DBC4046S	0.6	BT30-MD40F-80R	0.5	46	58	150	119	2
DBC5058S	1.1	BT30-MD50F-70	0.8	58	74	150	128	1
DBC2528S	0.3	BT40-MD25F-105R	1.9	28	35	165	100	2
DBC3235S	0.4	BT40-MD32F-115R	2.4	35	46	180	110	2
DBC4046S	0.6	BT40-MD40F-110R	2.7	46	58	180	130	2
DBC5058S	1.1	BT40-MD50F-100R	2.7	58	74	180	130	1
DBC6374S	2.0	BT40-MD63F-90	3.6	74	94	180	150	2
DBC8094S	3.5	BT40-MD80F-100	4.8	94	120	200	173	2
DBC2528S	0.3	BT50-MD25F-120R	4.7	28	35	180	100	2
DBC3235S	0.4	BT50-MD32F-235R	5.3	35	46	300	180	2
DBC4046S	0.6	BT50-MD40F-230R	5.6	46	58	300	250	2
DBC5058S	1.1	BT50-MD50F-250R	6.5	58	74	330	280	2
DBC6374S	2.0	BT50-MD63F-240R	8.4	74	94	330	280	2
DBC8094S	3.5	BT50-MD80F-175	9.5	94	120	275	225	1
DBC120S	5.3	BT50-MD80F-175	9.5	120	175	275	235	1

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts								
	Basic								
	Head	Spring Pin	Wrench Bolt	Wrench	Cartridge	Set Screw	Wrench	Clamp Screw	Torx Wrench
Type									
DBC2528S	DBC2528	SP0308	BX0415	LW-3	BCC28	BT0306	LW-1.5	FTKA02565	TRX7
DBC3235S	DBC3235	SP0410	BX0515	LW-4	BCC35	BT0308			
DBC4046S	DBC4046	SP0516	BX0620	LW-5	BCC46	BT0410	LW-2	FTNA0408	TRX15
DBC5058S	DBC5058	SP0616			BCC58	BT0412			
DBC6374S	DBC6374	SP1018	BX0830	LW-6	BCC74	BT0516	LW-2.5	BFTX0511N	TRX20
DBC8094S	DBC8094	SP1020	BX1035	LW-8	BCC94	BT0620	LW-3		
DBC120S	DBC120N	SP1020	BX0830	LW-6.0	BCC120	BT0830	LW-4.0	BFTX0511N	TRX20

BT-KMB Micro Boring



1DIV=Ø0.02mm

(mm)

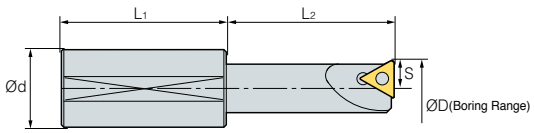
Designation	Head (Modular)	Boring Bite	L	L1	kg
BT40 - MD63F - 64	KMB6336	BB18-□(S)	141	64	5.5
BT50 - MD63F - 75	KMB6336	BB18-□(S)	152	75	7.0

Boring Head	Bite	MD NO.	L	kg
KMB6336	BB18-□(S)	BT□□-MD63F	77	2.2

• Through coolant system is optional.

M This is metric size. We can also provide in inch type

Boring Bite : BBtype(for KMB)



(mm)

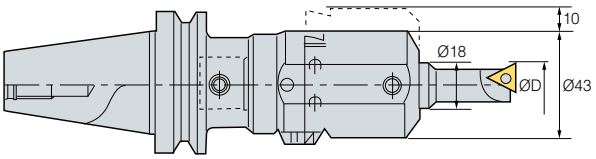
Designation		Boring Range(Center)		Boring Range(Side)		S	L1	L2	Insert	Insert Screw
		Min	Max	Min	Max					
BB	18-7(S)	7	40	43	91	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	42	45	93	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	44	47	95	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	46	49	97	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	48	51	99	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	50	53	101	8.5	40	50	TPGT1103□□L	BFTX0307A

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts				
	Basic			Option	
	Boring Head	Taper Screw	Wrench	Boring Bite	Basic Holder
Type					
KMB	KMB6336	BTT1620F	LW-8	BB18	MD63F

BT-SMB Small Micro Boring Bar



1DIV=Ø0.02mm

(mm)

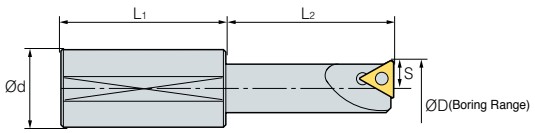
Designation	Head (Modular)	Boring Bite	L	L_1	kg
BT40 - MD40F - 60	SMB4022	BB18-O(S)	122.5	60	2.8
BT50 - MD40F - 60	SMB4022	BB18-O(S)	122.5	60	5.4

Boring Head	Bite	MD NO.	L	kg
SMB4022	BB18-O(S)	BTOO-MD40T	62.5	0.6

• Through coolant system not available

M This is metric size. We can also provide in inch type

Boring Bite : BBtype(for SMB)



(mm)

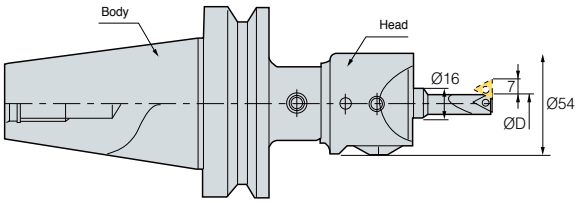
Designation		Boring Range Min	Boring Range Max	S	L_1	L_2	Insert	Insert Screw
BB	18-7(S)	7	27	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	29	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	31	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	33	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	35	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	37	8.5	40	50	TPGT1103□□L	BFTX0307A

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts				
	Basic			Option	
	Boring Head	Taper Screw	Wrench	Boring Bite	Basic Holder
Type					
SMB	SMB4022	BTT1013F	LW-5	BB18	MD40F

BT-SMH Small Micro Boring Bar (for High Precision)



(mm)

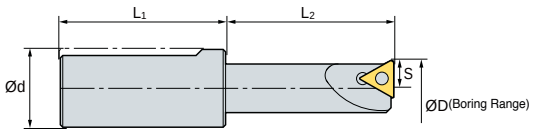
Designation	Head (Modular)	Boring Bite	L	L1	kg
BT40 - MD40F - 60	SMH4022	BB16-O(S)	109	60	3.0
BT50 - MD40F - 60	SMH4022	BB16-O(S)	109	60	6.0

Boring Head	Bite	MD NO.	L	kg
SMH4022	BB18-O(S)	BTOO-MD40F	49	2.7

• Through coolant system not available

M This is metric size. We can also provide in inch type

Boring Bite : BBtype(for SMH)



(mm)

Designation		Boring Range Min	Boring Range Max	S	L1	L2	Insert	Insert Screw	Wrench
BB	16-5(S)	5.5	19	2.75	34	20	WBGT0601□□L	BFTX0203A	TRX06
	16-7(S)	7	21	3.5	34	30	TBGT0601□□L	BFTX0204A	TRX06
	16-9(S)	9	23	4.5	34	40	TPGT0802□□L	BFTX0204A	TRX06
	16-11(S)	11	25	5.5	34	45	TPGT1103□□L	BFTX0307A	TRX10
	16-15(S)	15	29	7.5	34	50	TPGT1604□□L	BFTX0307A	TRX10
	16-19(S)	19	33	9.5	34	60	TPGT1103□□L	BFTX0410A	TRX15

M This is metric size. We can also provide in inch type

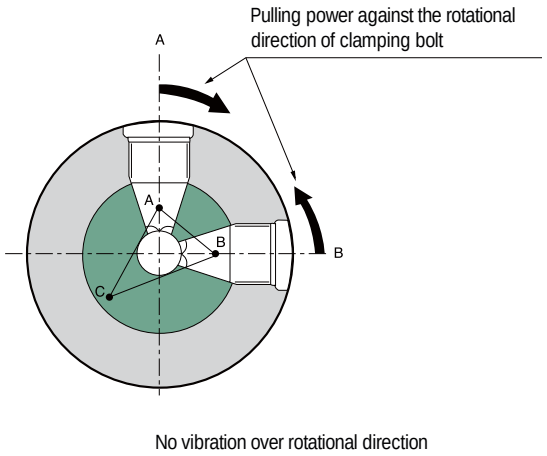
Parts

Division	Spare Parts				
	Basic			Option	
	Boring Head	Taper Screw	Wrench	Boring Bite	Basic Holder
Type					
SMH	SMH4022	BTT1013F	LW-5	BB16	MD40F

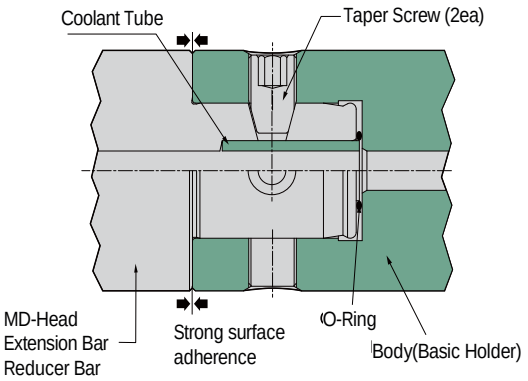
Versatile tooling system that can flexibly react to FMS

Modular System Series

- Versatile tooling system conforming to FMS specification.
- Flexible combination of tool units according to conditions of subject
- Joining with a specially designed screw provides high accuracy (error less than 5μm) and ease of detach for one step setting.
- Cutting edge of boring system aligned with the groove of drive key.
- Corresponding accuracy and stiffness compared to uni-body type.



No vibration over rotational direction



M This is metric size. We can also provide in inch type

BT-MD

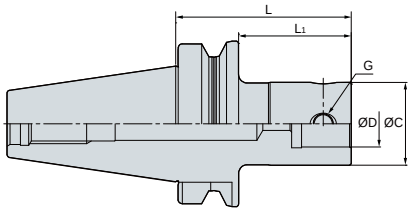


Fig. 1

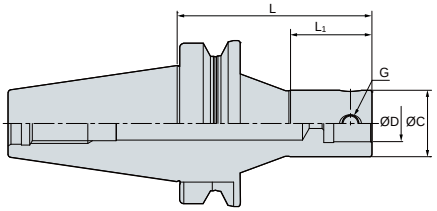


Fig. 2

(mm)

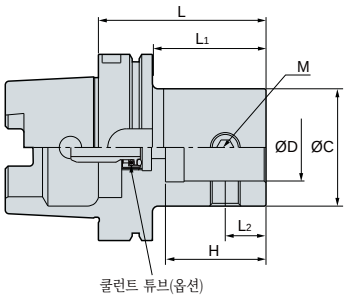
Designation		ØC	ØD	L	L1	G	kg	Fig.
BT30 -	MD19F - 70	19	11	70	45	M5	0.4	1
	MD25F - 90	25	14	90	63	M6	0.3	1
	MD32F - 80	32	18	80	55	M8	0.4	1
	MD40F - 45	40	22	45	22	M8	0.4	1
	MD40F - 60	40	22	60	36	M10	0.5	1
	MD40F - 80	40	22	80	56	M10	0.5	1
	MD50F- 70	50	28	70	48	M12	0.8	3
BT40 -	MD19F- 70	19	11	70	40	M5	1.8	1
	MD25F- 95	25	14	95	63	M6	1.9	1
	MD25F- 105R	25	14	105	40	M6	1.9	2
	MD32F- 100	32	18	100	70	M8	2.3	1
	MD32F- 115R	32	18	115	45	M8	2.4	2
	MD40F- 60	40	22	60	31	M10	2.7	1
	MD40F- 110R	40	22	110	60	M10	2.7	2
	MD40F- 115	40	22	115	83	M10	2.7	1
	MD50F- 105	50	28	105	73	M12	2.7	1
	MD63F- 64	63	36	64	37	M16	3.3	1
	MD63F- 110	63	36	110	83	M16	3.6	1
	MD63F- 135	63	36	135	108	M16	4.6	1
	MD80F- 100	80	45	100	73	M16	4.8	3
BT50 -	MD19F- 85	19	11	85	44	M5	4.3	1
	MD25F- 105	25	14	105	62	M6	4.5	1
	MD25F- 120R	25	14	120	40	M6	4.7	2
	MD32F- 110	32	18	110	67	M8	5.1	1
	MD32F- 115R	32	18	115	45	M8	5.1	2
	MD32F- 235R	32	18	235	115	M8	5.3	2
	MD40F- 60	40	22	60	22	M10	5.0	1
	MD40F- 195	40	22	195	152	M10	5.4	1
	MD40F- 230R	40	22	230	180	M10	5.6	2
	MD50F- 125	50	28	125	82	M12	6.0	1
	MD50F- 225	50	28	225	182	M12	6.4	1
	MD50F- 250R	50	28	250	81	M12	6.5	2
	MD63F- 75	63	36	75	35	M16	6.0	1
	MD63F- 130	63	36	130	87	M16	6.8	1
	MD63F- 195	63	36	195	152	M16	8.0	1
	MD63F- 230	63	36	230	187	M16	8.4	1
	MD80F- 75	80	45	75	36	M16	9.1	1
	MD80F- 110	80	45	110	69	M16	9.4	1
	MD80F- 175	80	45	175	134	M16	9.5	1
	MD90F- 75	90	45	75	34	M16	9.3	1
	MD90F- 145	90	45	145	104	M16	9.9	1
	MD90F- 195	90	45	195	154	M16	10.2	1

Spare Part I73

• Through coolant system available • Order made body available

M This is metric size. We can also provide in inch type

HSK-MD



(mm)

Designation		ØC	ØD	L	L1	L2	H	M
HSK 63A -	MD19F - 60	19	11	60	34	6.5	15.5	M5
	MD25F - 60	25	14	60	31	8	18.5	M6
	MD32F - 65	32	18	65	31	11	23.5	M8
	MD40F - 70	40	22	70	41	13	29	M10
	MD50F - 85	50	28	85	58	17	36	M12
	MD63F - 95	63	36	95	69	22	54	M16

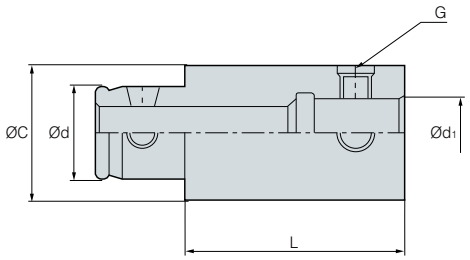
• Through coolant system available

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts	
	Basic	Option
	Taper Screw	Wrench
Type		
MD19F	BTT0506F	LW-2.5
MD25F	BTT0608F	LW-3
MD32F	BTT0810F	LW-4
MD40F	BTT1013F	LW-5
MD50F	BTT1215F	LW-6
MD63F	BTT1620F	LW-8
MD80F	BTT1626F	LW-8
MD90F	BTT1631F	LW-8

EXT Extension Bar



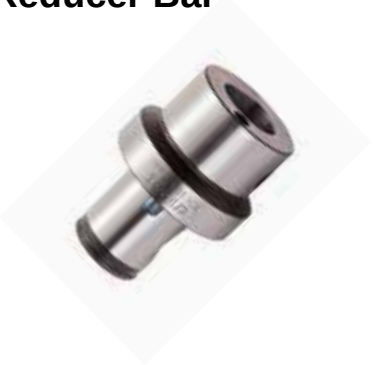
(mm)

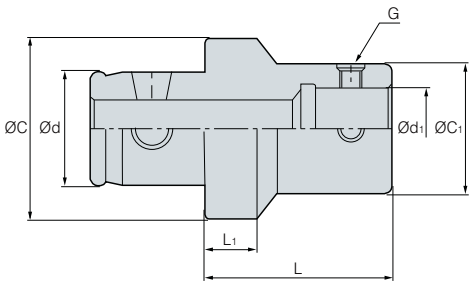
Designation		ØC	Ød	L	Ød1	G
EXT -	1930F	19	11	30	11	M5
	1950F	19	11	50	11	M5
	2530F	25	14	30	14	M6
	2550F	25	14	50	14	M6
	3235F	32	18	35	18	M8
	3260F	32	18	60	18	M8
	4040F	40	22	40	22	M10
	4090F	40	22	90	22	M12
	5050F	50	28	50	28	M12
	50100F	50	28	100	28	M12
	6360F	63	36	60	36	M16
	63120F	63	36	120	36	M16
	8070F	80	45	70	45	M16
	80120F	80	45	120	45	M16
	9080F	90	45	80	45	M16
	90130F	90	45	130	45	M16

• Through coolant system available

M This is metric size. We can also provide in inch type

RDC Reducer Bar





(mm)

Designation		Ød	ØC1	Ød1	ØC	L	L1	G
RDC -	3225F	18	25	14	32	30	9	M6
	4025F	22	25	14	40	30	9	M6
	4032F	22	32	18	40	30	9	M8
	5025F	28	25	14	50	30	9	M6
	5032F	28	32	18	50	30	9	M8
	5040F	28	40	22	50	40	10	M10
	6325F	36	25	14	63	30	9	M6
	6332F	36	32	18	63	30	9	M8
	6340F	36	40	22	63	40	10	M10
	6350F	36	50	28	63	45	10	M12
	8032F	45	32	18	80	30	9	M6
	8040F	45	40	22	80	40	10	M10
	8050F	45	50	28	80	45	10	M12
	8063F	45	63	36	80	50	13	M16

• Through coolant system available

M This is metric size. We can also provide in inch type

Parts

Division	Spare Parts		
	Basic		Option
	Taper Screw	Spring Pin	Wrench
Type			
MD19F	BTT0506F	-	LW-2.5
MD25F	BTT0608F	SP0308	LW-3
MD32F	BTT0810F	SP0410	LW-4
MD40F	BTT1013F	SP0516	LW-5
MD50F	BTT1215F	SP0616	LW-6
MD63F	BTT1620F	SP0818	LW-8
MD80F	BTT1626F	SP1020	LW-8
MD90F	BTT1631F	SP1020	LW-8

DAMPING PRO
Anti-Vibration Tool

KORLOY Anti-Vibration Tool

KORLOY DAMPING PRO

- The application of a special design provides an excellent Anti-Vibration effect and is optimized for Overhang work
- Capable to elevate Feed comparing to standard arbor with stable machining
- Longer tool life and noise decrease
- Provides a solution for Mold, Deep Cavity machining, and Heavy-duty work

Code System

KDP - CAT50 - FMA25.4 - 260

- **KDP** — KORLOY DAMPING PRO
- **CAT50** — Arbor Taper
  - CAT Type
  - BT Type
  - HSK Type
- **FMA25.4** — **FMA** : JIS B4113 Face milling; **FMB** : T-MAX Face milling / Shoulder Cutter; **FMC** : T-MAX Face milling / Shoulder Cutter
- **260** — Length of gauge line

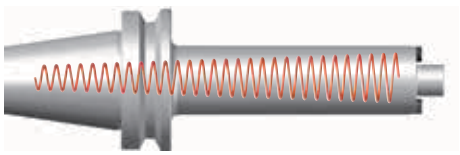
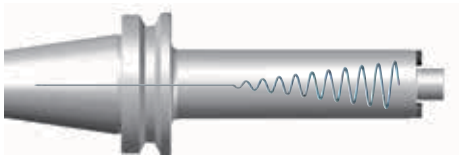
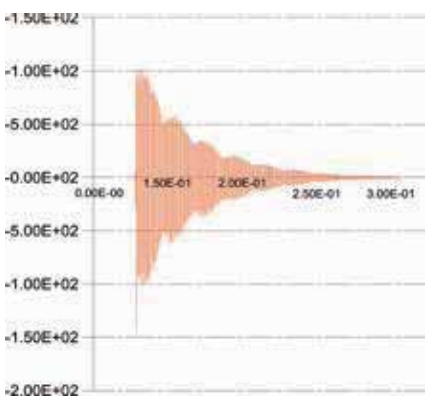
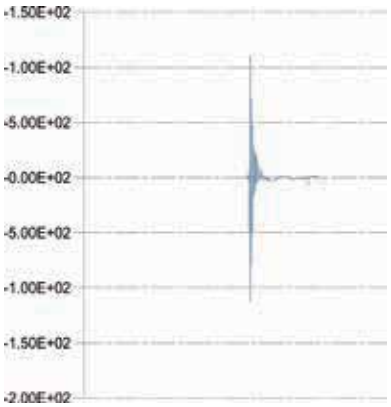
Features

- ▶ Anti-Vibration : Exclusively designed Anti-Vibration structure
- ▶ Material : Special alloy steel
- ▶ Anti-Vibration body : Application of High density damper
- ▶ Overhang : Capable for 2D ~ 5D
- ▶ Coolant : Inner coolant is capable

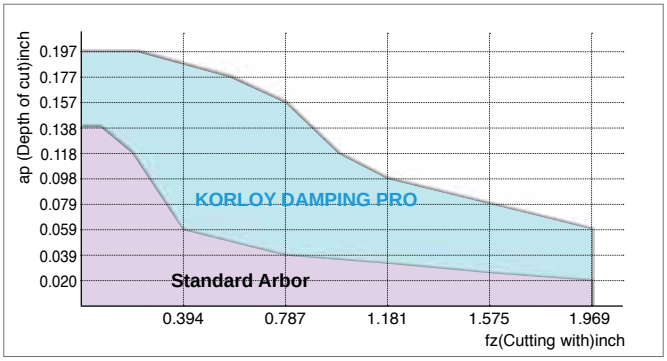
▶ Size : Various types and sizes are applicable

CAT Type | BT Type | HSK Type

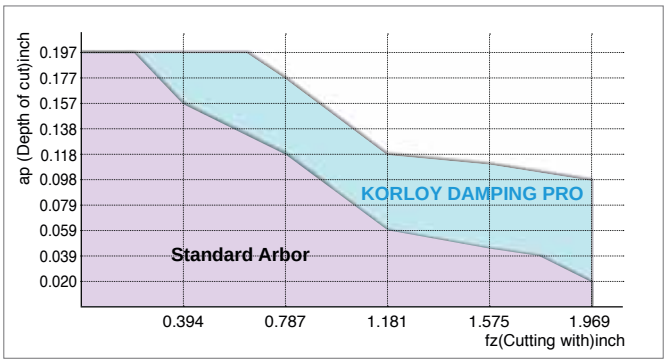
Comparison of Vibration damping time

Standard Arbor	KORLOY DAMPIG PRO
	
	
Longer Vibration damping time / Chattering is caused while Overhang work	Short Vibration damping time / Performance is 2~3 times better than standard arbor

Features



Cutting condition : fz(ipt) = 0.004
vc(sfm) = 328
CUTTER : AMC4063HS 6flute
Arbor : BT50-FMC22-210 General arbor
KDP-BT50-FMC22-210



Cutting condition : fz(ipt) = 0.004
vc(sfm) = 328
CUTTER : FMRC3063HRD-H 6flute
Arbor : BT50-FMC22-210 General arbor
KDP-BT50-FMC22-210

Application Example

Mold machining	Side milling cutter machining	Facing for long depth	Deep-hole Boring machining
			
Better productivity than general arbor	Excellent performance in the deep grooving	Better productivity and surface roughness than General arbor	Better surface roughness and machinability than General arbor

Side milling cutter machining example

- Faulty occurrence on size and surface roughness by the vibration, when use the general arbor
- **Using DAMPING PRO, good size and surface roughness**

■ General arbor

Cutting condition :
vc(sfm) = 164
fz(ipt) = 0.039
ae(inch) = 0.787

■ DAMPING PRO

Cutting condition :
vc(sfm) = 328
fz(ipt) = 0.039
ae(inch) = 0.787

Big size Crankshaft machining example

- General arbor : ap = 0.079inch
- KORLOY DAMPING PRO : ap = 0.157inch available
- **2 times better productivity**

■ General arbor

Cutting condition :
vc(sfm) = 328
fz(ipt) = 0.045
ap(inch) = 0.079

■ DAMPING PRO

Cutting condition :
vc(sfm) = 328
fz(ipt) = 0.045
ap(inch) = 0.157

BT-FMA

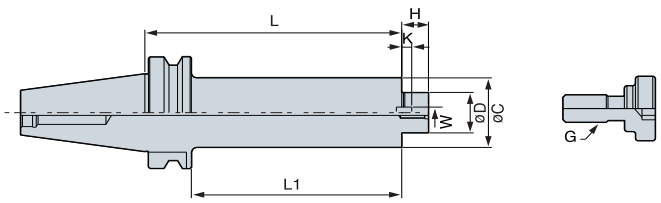


Fig.1

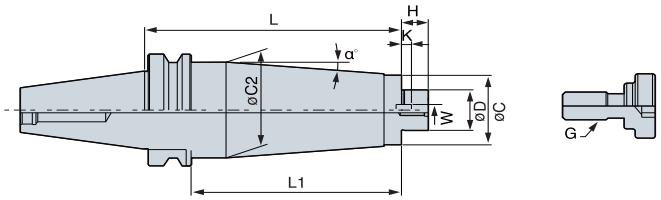


Fig.2

(inch)

Designation	Cutter Dia.	ØD	L	L1	ØC	ØC2	H	G	lbs	Fig.	α°
KDP-BT40-FMA1-8	3	1	8	6.937	2.25	-	0.69	1/2-20UNF	11.95	1	-
FMA1-10	3	1	10	8.937	2.25	-	0.69	1/2-20UNF	14.33	2	-
KDP-BT50-FMA1-8	3	1	8	6.504	2.25	3	0.69	1/2-20UNF	21.23	2	4
FMA1-10	3	1	10	8.504	2.25	3	0.69	1/2-20UNF	26.01	2	3
FMA1.25-8	4	1.25	8	6.771	3	3.3	0.75	5/8-18UNF	28.00	2	1
FMA1.25-10	4	1.25	10	8.504	3	3.3	0.75	5/8-18UNF	31.31	2	1

Parts

Division	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Wrench Bolt	Wrench Bolt	Wrench
Type					

CAT-FMA

ANSI/ASMEB5.50-1985

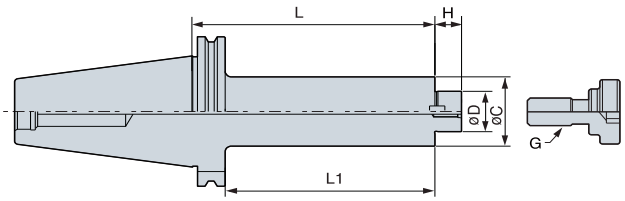


Fig.1

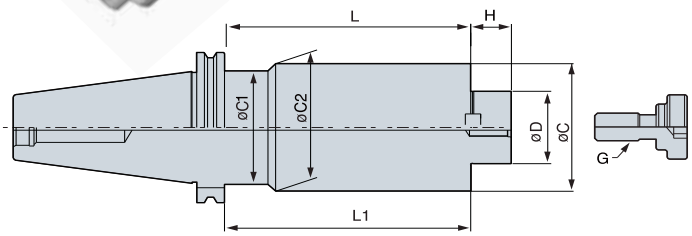


Fig.2

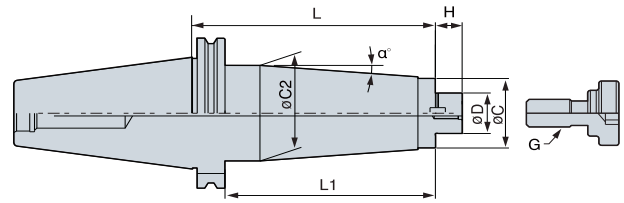


Fig.3

(inch)

Designation	Cutter Dia.	ØD	L	L1	ØC	ØC1	ØC2	H	G	lbs	Fig.	α°
KDP-CAT40-FMA0.75-8	2.5	0.75	8	7.25	1.75	-	-	0.69	3/8-24UNF	7.50	1	-
KDP-CAT40-FMA1-8	3	1	8	7.25	2.25	-	-	0.69	1/2-20UNF	10.54	2	-
KDP-CAT50-FMA1-8	3	1	8	7.25	2.25	-	2.759	0.69	1/2-20UNF	18.30	3	2
FMA1-10	3	1	10	9.25	2.25	-	2.759	0.69	1/2-20UNF	21.65	3	1
FMA1.25-8	4	1.25	8	7.25	3	-	2.759	0.75	5/8-18UNF	20.72	3	1
FMA1.25-10	4	1.25	10	9.25	3	-	2.759	0.75	5/8-18UNF	24.03	3	1

Parts

Division	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Wrench Bolt	Wrench Bolt	Wrench
Type					

HSK-FMA

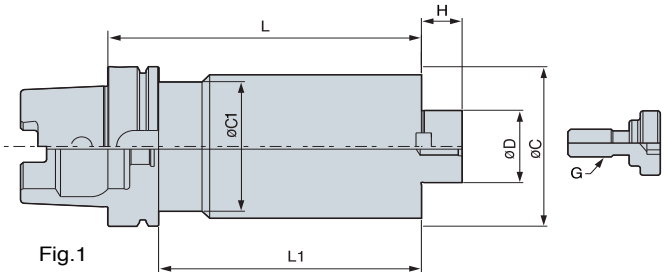


Fig.1

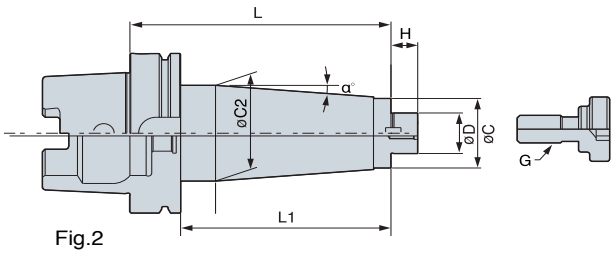


Fig.2

(inch)

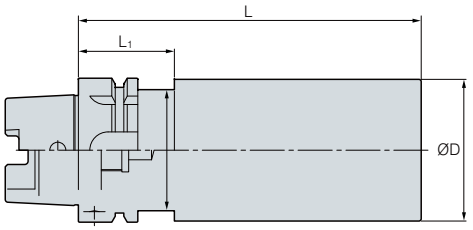
Designation		Cutter Dia.	ØD	L	L1	ØC	ØC1	ØC2	H	G	lbs	Fig.	α°
KDP-HSK63-	FMA1-8	3	1	8	6.976	2.25	2.08	-	0.69	1/2-20UNF	10.80	1	0.1
	FMA1-10	3	1	10	5.791	2.25	2.08	-	0.69	1/2-20UNF	12.99	1	0.1
KDP-HSK100-	FMA1-8	3	1	8	6.858	2.25	-	3	0.69	1/2-20UNF	18.34	2	3
	FMA1-10	3	1	10	8.858	2.25	-	3	0.69	1/2-20UNF	22.05	2	2
	FMA1.25-8	4	1.25	8	6.858	3	-	3.3	0.75	5/8-18UNF	24.87	2	1
	FMA1.25-10	4	1.25	10	8.858	3	-	3.3	0.75	5/8-18UNF	29.94	2	1

• Key and screw are clamped.
• Wrench is separately sold.

Parts

Division	Spare Parts				
	Basic				Option
	Key	Clamp Bolt	Wrench Bolt	Wrench Bolt	Wrench
Type					

BLK Blank Tool



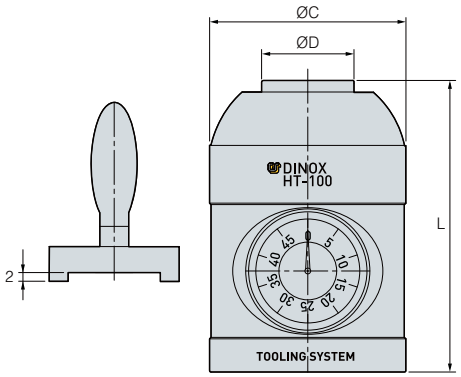
(mm)

Designation	Ød	ØC	L	L1
HSK40A - BLK42 - 180	42	34	180	35
HSK50A - BLK52 - 200	52	42	200	42
HSK63A - BLK63 - 150	63	52	150	42
BLK63 - 250	63	52	250	42
BLK82 - 200	82	52	200	42
HSK100A - BLK102 - 150	102	85	150	45
BLK102 - 250	102	85	250	45
BLK126 - 200	126	85	200	45
BT30 - BLK48 - 180	48	44	180	30
BT40 - BLK63 - 150	63	61	150	35
BLK63 - 250	63	61	250	35
BLK82 - 200	82	61	200	35
BT50 - BLK102 - 150	102	98	150	48
BLK102 - 250	102	98	250	48
BLK126 - 200	126	98	200	48

• Heat treatment Hardness for shank portion(HRC48~52) and Tooling portion(HRC40~43) according to Blank Tool's Figure & Application
• Blank Tool needs for specal Tool or short delivery and order made can be produced

M This is metric size. We can also provide in inch type

HT



(mm)

Designation	ØD	ØC	L
HT-100	32	68	100

• Good for setting the Tool length at CNC machine
• No inturferance between height Touch setter and Tool makes safe work
• Location Accuracy : ± 0.003mm

M This is metric size. We can also provide in inch type

SC Spindle Cleaner

(mm)

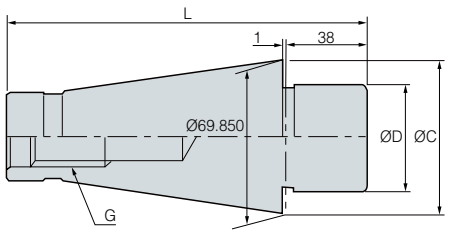
Designation		Taper	N.W.	G.W.
SC -	**BT30**	BT30	0.06kg	0.08kg
	BT40	BT40	0.07kg	0.1kg
	BT50	BT50	0.16kg	0.2kg
	HSK50	HSK50	0.08kg	0.12kg
	HSK63	HSK63	0.1kg	0.13kg
	HSK100	HSK100	0.5kg	0.7kg

M This is metric size. We can also provide in inch type

Features

▶ Cleaning ships of taper wipe is made of lambskin.
It can clean inside slide of spindles to prevention of static electricity and to extend spindles and tapers durable life.

KCP

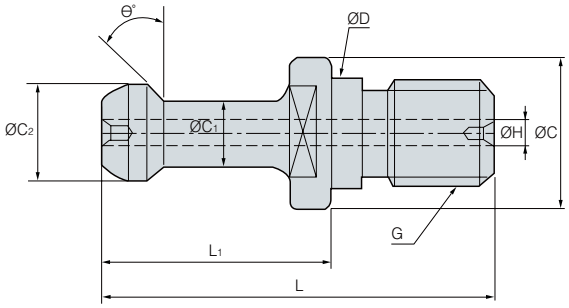


(mm)

Designation		Taper	Cutter Dia.	ØD	ØC	L	G
NTN 50 -	KCP47.625	NT50	200(8″이상)	47.625	69.55	164.00	U1"-8(M24)
	KCP60	NT50	200(8″이상)	60	69.55	164.00	M24

M This is metric size. We can also provide in inch type

Pull Stud Bolt



(mm)

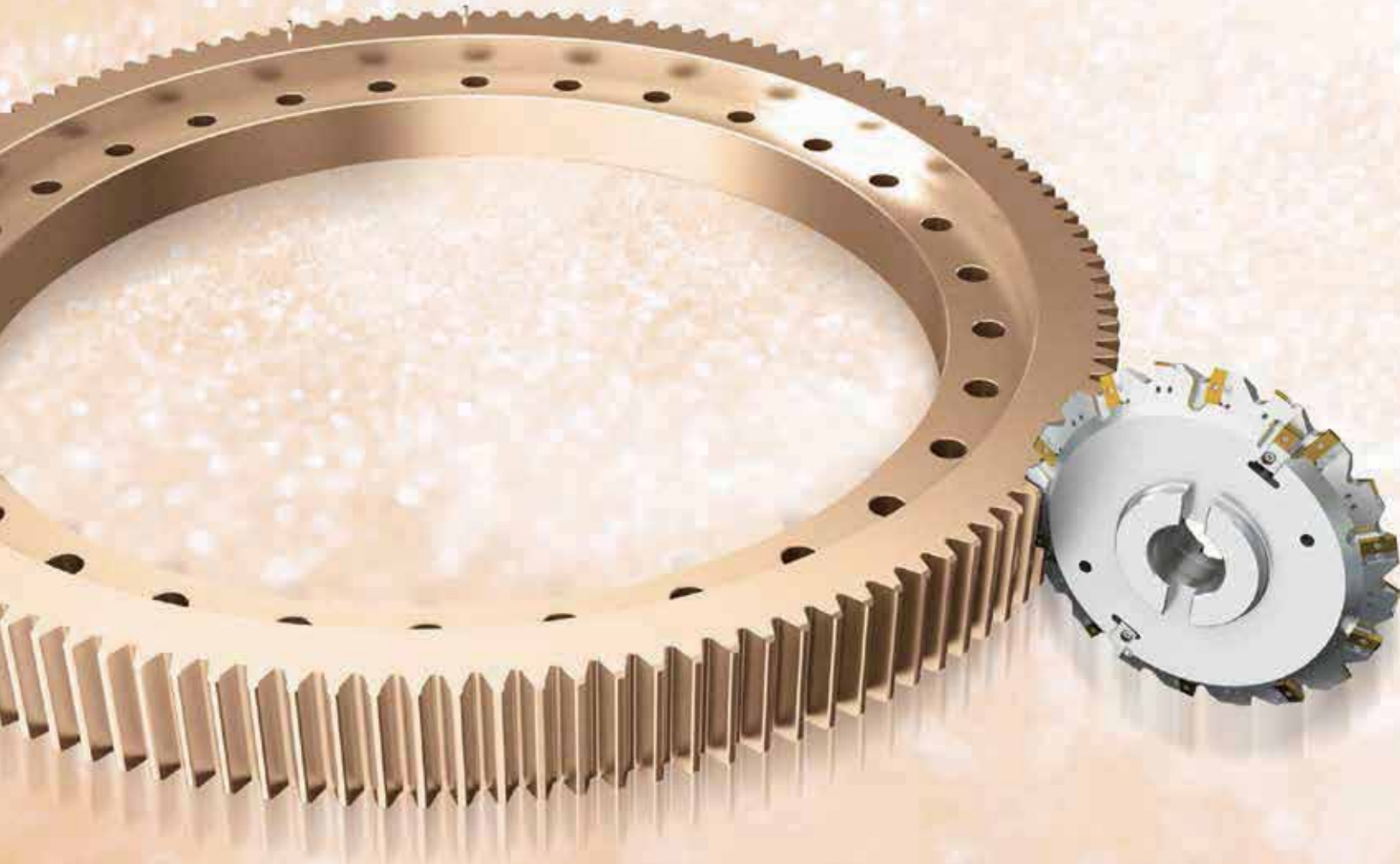
Designation	ØD	ØC	ØC1	ØC2	L1	L	θ	G	ØH
P20T-1	8.5	12	6	8.5	17.5	31.5	15°	M8	
P30T-1	12.5	16.5	7	11	23	43	45°	M12	
P30T-1(Ø2.5)	12.5	16.5	7	11	23	43	45°	M12	Ø2.5
P30T-2	12.5	16.5	7	11	23	43	30°	M12	
P30T-2(Ø2.5)	12.5	16.5	7	11	23	43	30°	M12	Ø2.5
P40T-1	17	23	10	15	35	60	45°	M16	
P40T-1(3)	17	23	10	15	35	60	45°	M16	Ø3
P40T-2	17	23	10	15	35	60	30°	M16	
PS40-3F	17	23	10	15	35	60	0°	M16	
PS-G51	17	22	12.45	18.8	19.11	44.11	45°	M16	Ø7
DIN69872-A40	17	23	14	19	26	54	15°	M16	Ø7
DIN69872-B40	17	23	14	19	26	54	15°	M16	
JISB6339-A40(PS-806)	17	23	14	19	29	54	15°	M16	Ø7
JISB6339-B40(PS-805)	17	23	14	19	29	54	15°	M16	
P50T-1	25	38	17	23	45	85	45°	M24	
P50T-1(7)	25	38	17	23	45	85	45°	M24	Ø7
P50T-2	25	38	17	23	45	85	30°	M24	
PS50-1F	25	38	17	23	45	85	0°	M24	
PS50-1FH	25	38	17	23	45	85	0°	M24	Ø8
PS-G41	25	37	20.83	28.96	25.2	65.2	45°	M24	Ø10
DIN69872-A50	25	36	21	28	34	74	15°	M24	Ø11.5
P50T-1HS	25	38	17	23	45	85	45°	M24	Ø5.7

M This is metric size. We can also provide in inch type


DAMPING PRO
Anti-Vibration Tool

J

TOOLING EXAMPLES



Industrial Tooling Example

Automobile Tooling Examples

TOOLING EXAMPLES

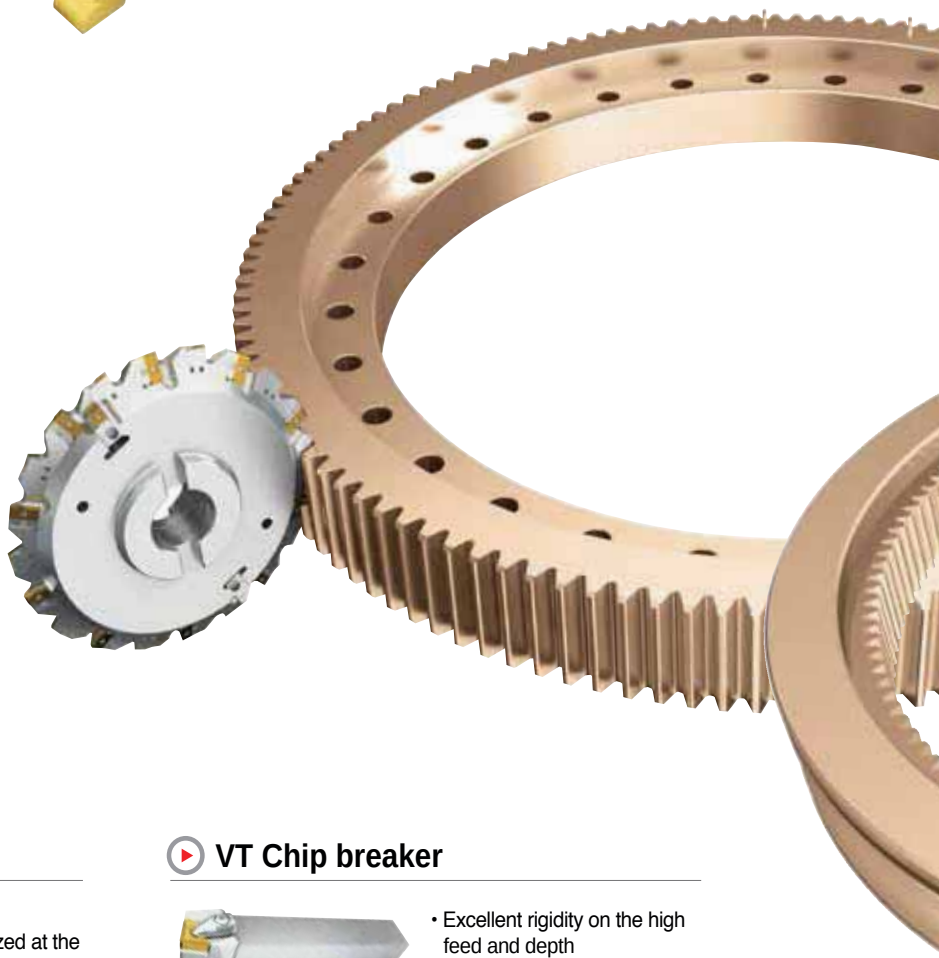
Gear machining (External Gear)

Cutter For Roughing

- Cutter diameter : Ø11.8
- The Number of Edges : 60
- Available for High Speed working through ontrolled V-Style edges to reduce Cutting Force

Cutter For Medium

- Cutter diameter : Ø11
- The Number of Edges : 48
- Available for High Efficiency and Long Life and high productivity through Korloy's own insert shape
- Made R part of gear by proper designed 'R'-shape of insert



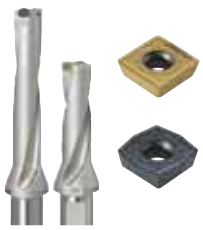
Cutter For Finishing: M20

- Cutter diameter : Ø15.7
- The Number of Edges : 20
- Gear cutter for Medium is realized on the 4 grade of precision.(KS, JS)
- Chamfering system available for machining efficiency

Hob Cutter

- Cutter diameter : Ø13.7
- The Number of Edges : 100
- Indexable Hob for roughing worked by generating cutting action
- Available for customized producing by user

KING DRILL



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

VT Chip breaker

- Excellent rigidity on the high feed and depth
- Excellent impact resistance and long life based on stable structure and outstanding rigidity
- Type of SNMM / CNMM

TPDBA

High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

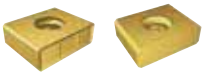
VH Chip breaker

- Innovative improved chip breaking on the medium working
- Provided good performance on the flange and continuous working
- Type of SNMM / CNMM

Gear machining (Internal Gear)

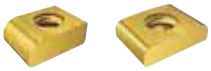
Cutter for Roughing

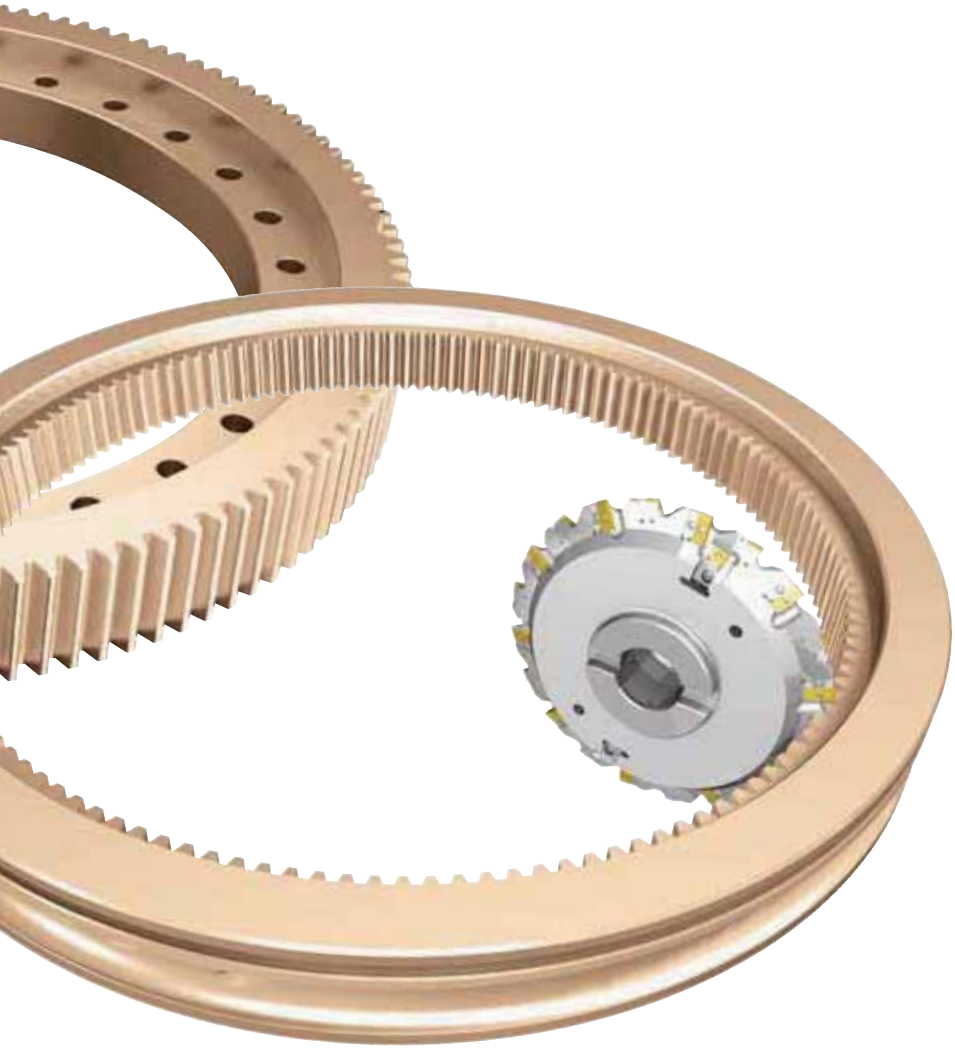
- Cutter diameter : Ø22
- The Number of Edges : 140
- Available for all module gear working is caused by edges designed stair shape



Cutter for Medium

- Cutter diameter : Ø15.7
- The Number of Edges : 48
- Available for making involute curve shape of internal gear

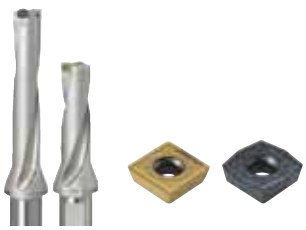




Cutter for Finishing

- Cutter diameter : Ø15.7
- The Number of Edges : 20
- Cutter for finishing available for 4 grades accuracy of internal gear
- Available for chamfering on the same time and unnecessariness of extra working

KING DRILL



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

TPDBA

High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

Ship building (Engine block)

Roughing cutter for cylinder block

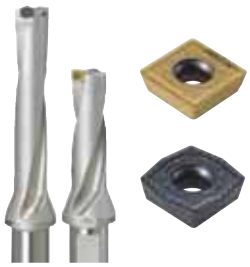
- Cutter diameter: Ø7.87
- Applicable insert: SNCF1507ANN-MF
- Economical concepts: 8 edge available insert, high feed available tool
- KORLOY exclusive latch clamping system provides quick change of insert

TPDBA

High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

KING DRILL



Optimal indexable drill design

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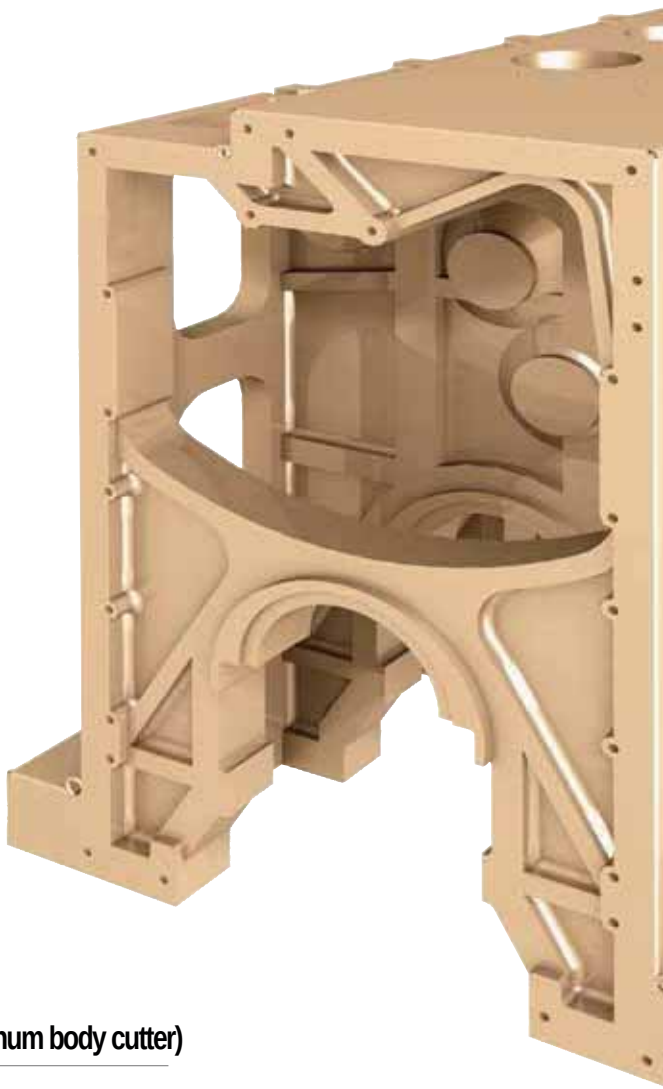
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300



Cylinder block cam shaft boring cutter (Aluminum body cutter)

- Cutter diameter : Ø10.6
- Applicable insert : LNE434 / SDKX1506
- Right-hand rotational aluminum cutter body, easy to handle, makes high precision boring

Cylinder block roughing and medium (Both)

- Cutter diameter: Ø9.8
- Applicable insert: LNE434 / LNCS1907-R3.0-WC
- Designs available for roughing and medium applications
- Available high efficiency working to chose LNE 434 insert for roughing and high reliability grade
- Good surface working through LNCS1907-R3.0-WC Wiper shape for medium

High rake-angle applied cylinder block roughing cutter

- Cutter diameter : Ø9.8
- Applicable insert : SECN2606AFN
- High rake angle cutter suitable for the machining applications that have the tendency to create chatter

Adjustable medium machining cutter

- Cutter diameter : Ø9.8
- Applicable insert : LNCS1907-C1.5-WC
- Cutting edge height adjustable device provides excellent surface finish

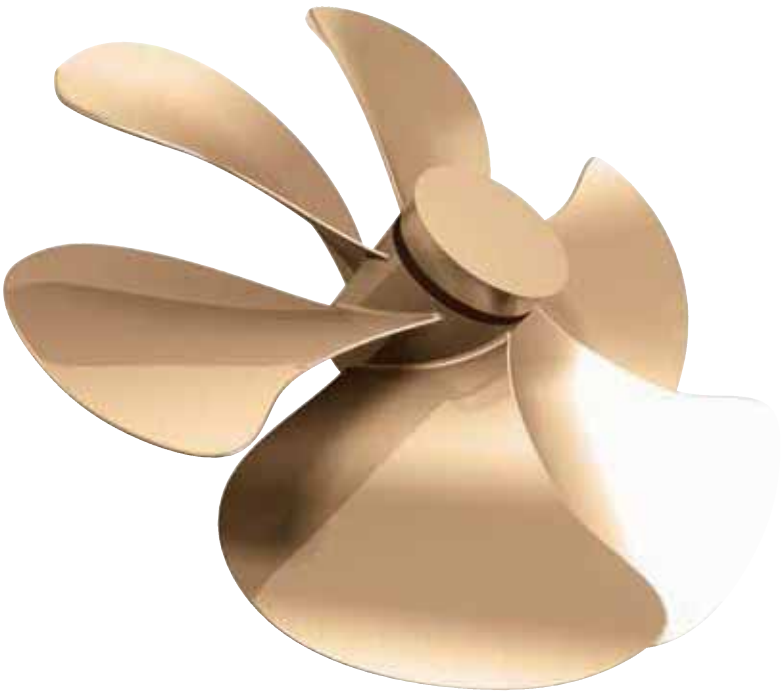
Cylinder block bearing cap seat machining cutter

- Cutter diameter: Ø9.8
- Applicable insert: RDKT2006M0
- Several sizes of inserts are prepared to meet the radius requirement of work-piece
- Rigid inserts for high efficiency machining

Ship building (Crank shaft / Propeller)

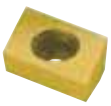
KORLOY exclusive screw-on type internal pin miller

- Cutter diameter : Over Ø78.7
- Weight : 1.5 tons
- Pin miller for crank shaft of medium size ship engine
- Special segment assembly system developed by KORLOY makes it easy to handle and provides excellent cutting performance with good chip forming



Periphery side of propeller machining tool

- Cutter diameter : Ø5.9
- Applicable insert : CDEW170708R
- Positive relief angle applied to get smooth cutting without chatter

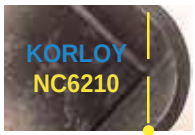


Top face of propeller machining tool

- Cutter diameter : Ø9.8
- Applicable insert: SECN1904EER
- Double layer insert array provides big depth of cut

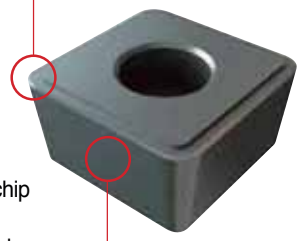
Role machining (Body / Shape / Parting-off)

Role machining (Body / Shape / Parting-off)



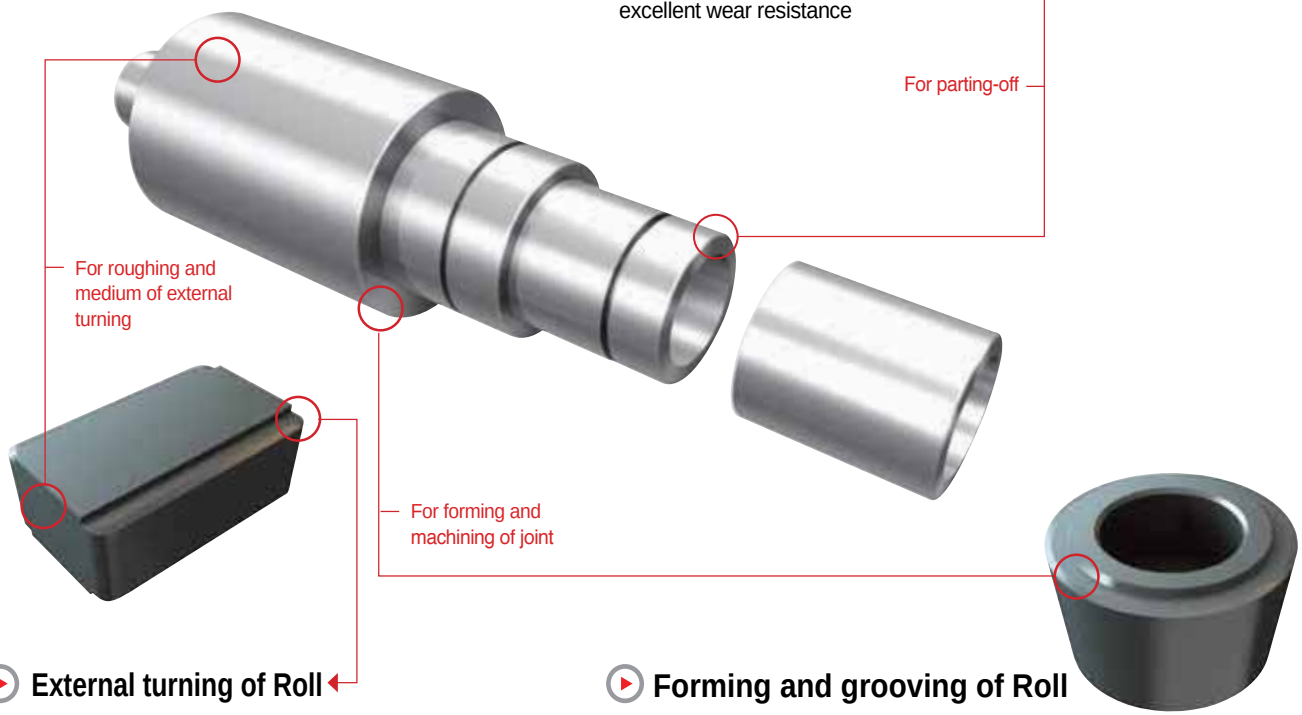
- Good chip evacuation even in deep grooving
- High hardness coating grade that has excellent wear resistance prevents damage from cutting load. (Photo shows edge damage after machining same time under same conditions)

Closer chip breaker to the cutting edge provides better chip control even in deep grooving



Parting-off Roll

- Unique insert geometry for better chip control even in deep grooving
- High hardness coating grade provides excellent wear resistance



For parting-off

For roughing and medium of external turning

For forming and machining of joint

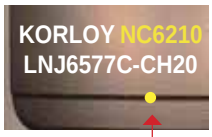
External turning of Roll

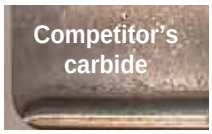
- Match of high hardness coating grade(NC6210) with chip breaker provides longer tool life with smooth chip control
- Various cutting edge designs are applicable according to workpiece materials and cutting conditions

Forming and grooving of Roll

- Special chip breaker focus on suitable chip forming (engineered chip breaker width and depth)
- Strong cutting edge treatment prevents un-expected fracture of insert

Application case





The combination of high hardness coating grade (NC6210) and chip breaker shows better performance

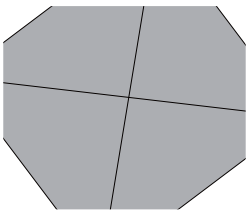
- Equipped with wide chip breaker enough to prevent crater wear
- Better chip control from the beginning of the machining, together with high hardness coating grade provides 3 times longer tool life than conventional tool. (especially at finishing)

Railway Industry (Separator / Crossing / Rail)

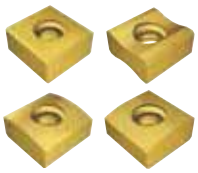
Rail separator joint face milling cutter

- Cutter diameter : Ø6.3
- The Number of Edges : 54
- Special customizing is available upon customer's requests

Cutter for top of guard-rail working



- Cutter diameter : Ø6.3
- The Number of Edges : 16
- Precise forming of rail way is possible

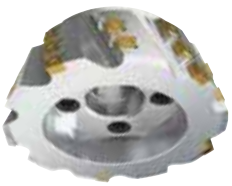


- Cutter diameter : Ø11.8
- The Number of Edges : 33
- One body design of cutter and arbor provides high rigidity

Taper milling for top of guard-rail working

- Cutter diameter : Ø7.8
- The Number of Edges : 24
- Economical 8 edge available insert
- Special customizing is available insert
- Special customer's requests upon customer's requests

Periphery face milling for the top side of rail way



- Cutter diameter : Ø9.4
- The Number of Edges : 25

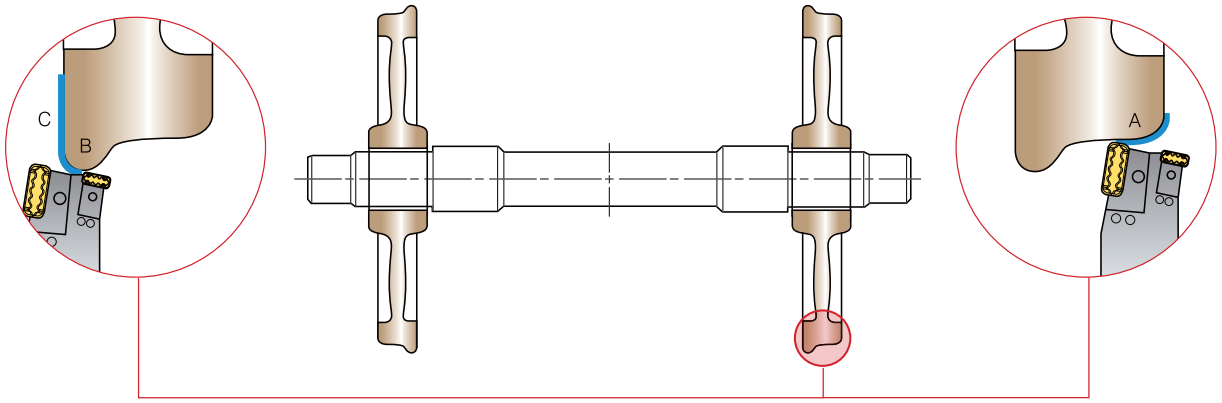
Cutter for repairing rail

- Cutter diameter : Ø23.6
- The Number of Edges : 198
- Milling applicable on the rail of part requested repairing

Rail Industry (Wheel)

The type of LNUX for the working of wheel (Repair)

- Material : SSW2. Ø36.2~39.3
- Cutting conditions : vc=255sfm (13~18min^{-1}), fn=0.039(ipr), ap=0.018~0.157(inch)
- Insert : LNUX301940-TM Grade : NC3220
- Result : good chip evacuation, stable structure and long life tool life



LNUX301940-TF

- For light cutting, it generates a low load with good chips

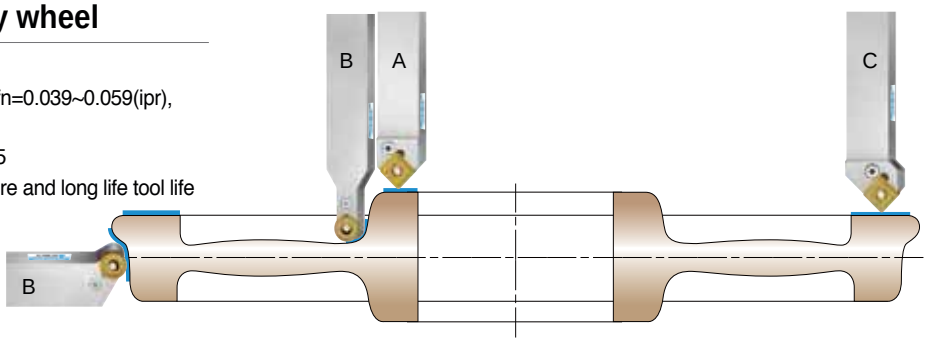
LNUX301940-TM

- Comprehensive design for general use, strong cutting edge with good chip forming (First recommendation)

Working procedure	A	B	C
Insert	LNUX301940-TF/TM	LNUX191940-25/22	
Grade	NC3220	NC3220	
Cutting condition	Decrease the speed on deep part of A	Increase the speed to get good chip evacuation	

RCMX insert for rail way wheel

- Material: SSW2. Ø33
- Cutting conditions: vc=180.4~328.08(sfm), fn=0.039~0.059(ipr), ap=0.039~0.236(inch)
- Insert: RCMX3209M0-SL Grade: NC3015
- Result: good chip evacuation, stable structure and long life tool life



VT chip breaker

- Strong cutting edge for high feed and deep cutting depth
- Tough design of chip breaker provides excellent impact resistance
- SNMM type

SL chip breaker

- Comprehensive chip breaker covers wide application range
- Proper chip control with long tool life

B chip breaker

- Comprehensive roughing design having strong edge strength with long tool life

SB chip breaker

- Better chip control at low depth of cut machining

TM chip breaker

- Medium-finishing chip breaker, proper surface finish, superior wear resistance

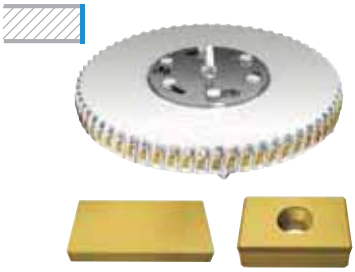
Working procedure	A	B	C
Applicable insert			
Holder	PSDNN5050-U25	PRDCN5050-U32 PRGCN5050-U32	PSSNR5050-S25
Insert	SNMM856-GH	RCMX3209MO-SL	SNMM856-VT
Grade	NC3220	NC3220	NC3220

Pipe Industry (Edge milling)

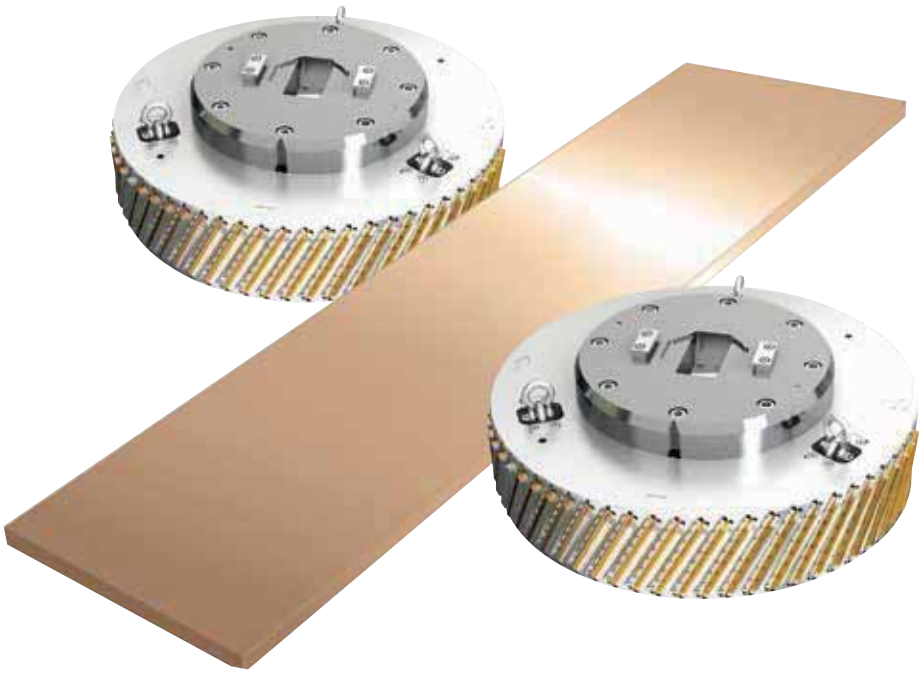
" X " shape machining

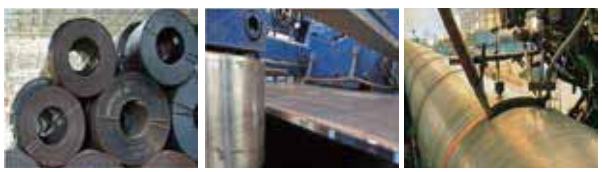
- A cutter to make the "X" shape on the both side-end of steel plate, to do bevel-end welding
- Locator wedge type clamping system applied for the cutter provides long durability of cutter as well as strong clamping power
- Grade: NC5340

" I " shape machining



- A machining to make "I" shape on the both side-end of steel plate, to do bevel-end or plane-end welding.
- Variety of inserts (with chip breaker or without chip breaker) are available according to your cutting conditions
- Grade: NC5340

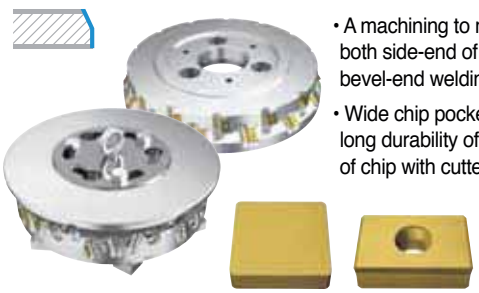




A-1 ····▶ A-2 ····▶ A-3

B-1 ····▶ B-2 ····▶ B-3

" Y " shape machining

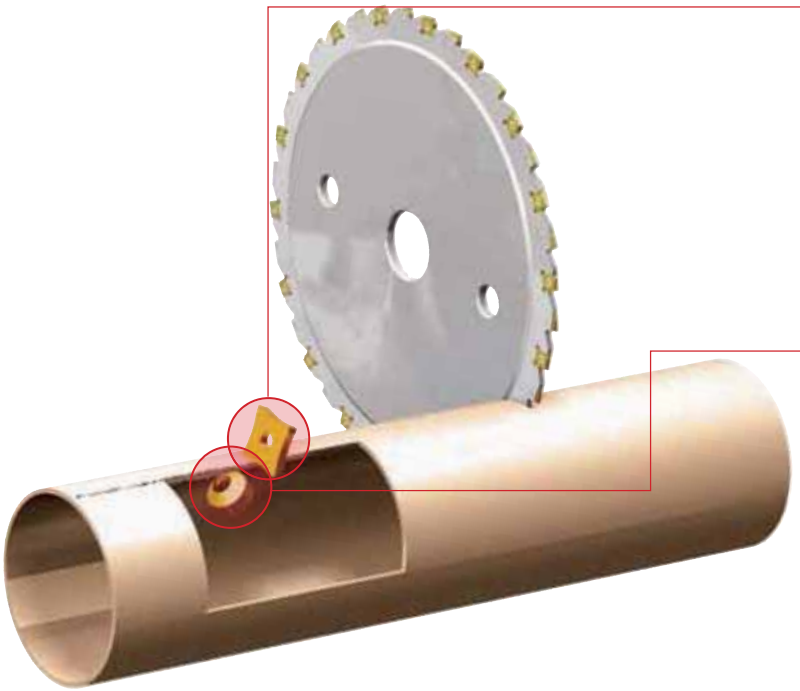


- A machining to make "Y" shape on the both side-end of steel plate, to do bevel-end welding
- Wide chip pocket on cutter provides long durability of it by reducing contact of chip with cutter body

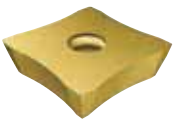
Special machining

- Special design of cutter as per side-end shape of steel plant upon customer's request is available

Pipe Industry (Bead removal / Parting-off / Chamfering)



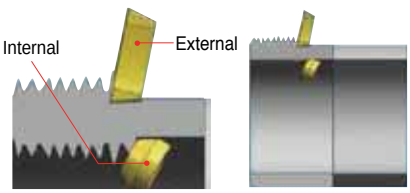
Bead removal insert : External

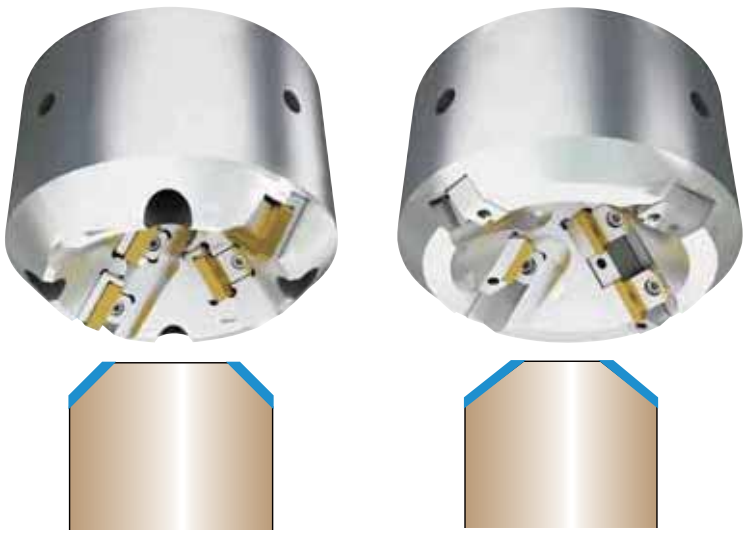


- Tool removing protruded part of melted welding material at outside of pipe
- Economical tool by using square insert, utilizing 4 cutting edges
- Grade: NC3030

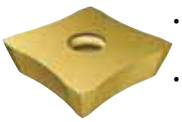
Bead removal insert : Internal

- Tool removing protruded part of melted welding material at inside of pipe
- Grade: CX1222

Working Method	Application range	Applicable Inserts	Cutter
	For external bead removal	SDMX80-R□□/ SEGW54-R□□ SNMG150708-R□□ / SNMN1207(SUN452)-□□R SNMN1507(SNU552)-□□R / SOET1906-254 SEGX2509-R□□	Customizing
	For internal bead removal	AR□□(AC) / SF□□R-□□	



Chamfer Tool

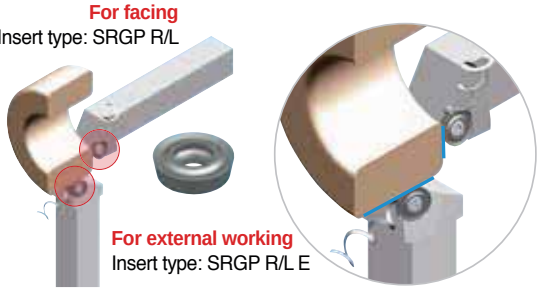


- Chamfering tool machining cut-off face of pipe
- Special chamfering angle design is possible upon customer's request
- Cost effective concept: Triangle and Square double sided insert provides 6~8 effective cutting edges
- Grade : NCM325, PC3500

Bearing

For external and facingworking

For facing
Insert type: SRGP R/L

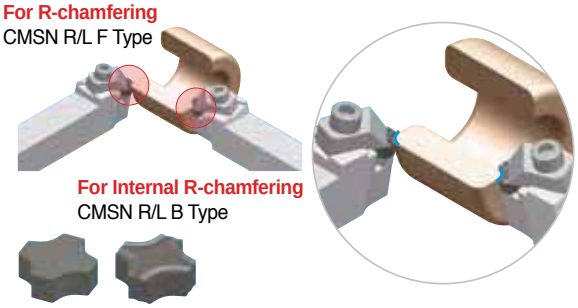


For external working
Insert type: SRGP R/L E

• Applicable on the internal, external and facing working

For Internal and external R-chamfering

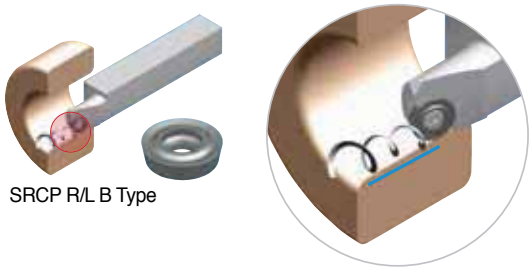
For R-chamfering
CMSN R/L F Type



For Internal R-chamfering
CMSN R/L B Type

• Applicable 8 corner of insert
• R-shape is realized to internal and external part of corner

For internal working



SRCP R/L B Type

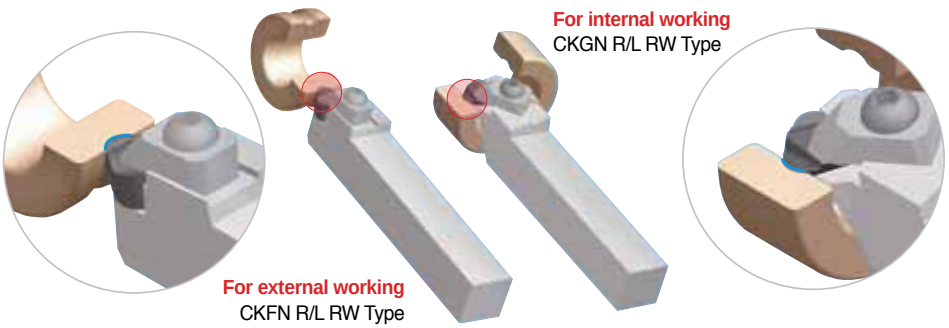
• Applicable over Ø0.472

SSKP R/L B Type

• Applicable over Ø0.453 with 4-corner insert for internal and low working

For ray-way

• For Ray-way on internal and external bearing
• Applicable 3 corner insert
• Able to customize

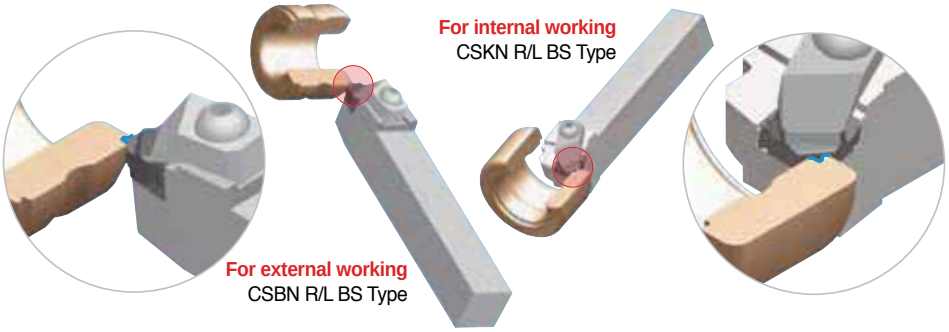


For internal working
CKGN R/L RW Type

For external working
CKFN R/L RW Type

For shield way

• For shield working on internal and external bearing
• Applicable 4 corner insert
• Able to customize



For internal working
CSKN R/L BS Type

For external working
CSBN R/L BS Type

Power Generation (Wind Power Generation Shaft / Tower Flange)

VH Chip breaker

- Good chip control in heavy machining
- Excellent performance for flange machining
- Suitable for continuous cutting conditions
- SNMM / CNMM type

VT Chip breaker

- Strong cutting edge for high feed and deep cutting depth
- Though design of chip breaker provides excellent impact resistance
- SNMM / CNMM type

TM (Thread Milling)

- Thread milling indexable tools
- Various type of holder (standard, long, taper) and inserts
- Screw diameter: Ø0.354 ~ Ø1.811inch

H-MAX

Solid end-mill for hardened material

- Sub-micron carbide provides strength on sharp cutting edge preventing small chipping on it
- Advanced PVD coating has high hardness with strong antioxidation property, provides excellent tool life at the machining of hard to cut material having high hardness

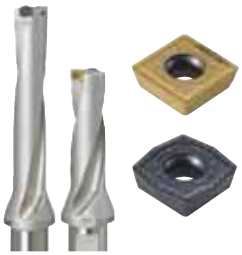
RCMX type

- High quality machining
- Rigid insert ensures good surface finish and long tool life
- RCMX type

Vulcan Drills (VZD)

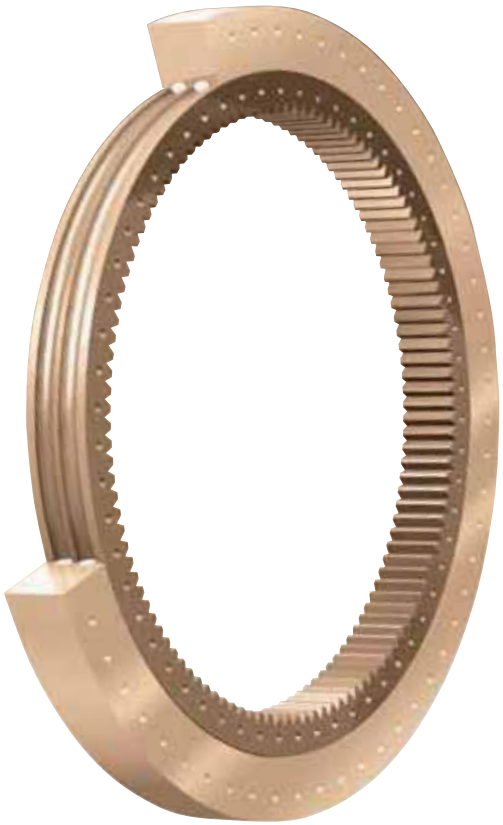
- Rigid body for high feed and precision machining
- Better chip evacuation from improved chip breaker
- Applicable for the drilling under poor cutting conditions

KING DRILL



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

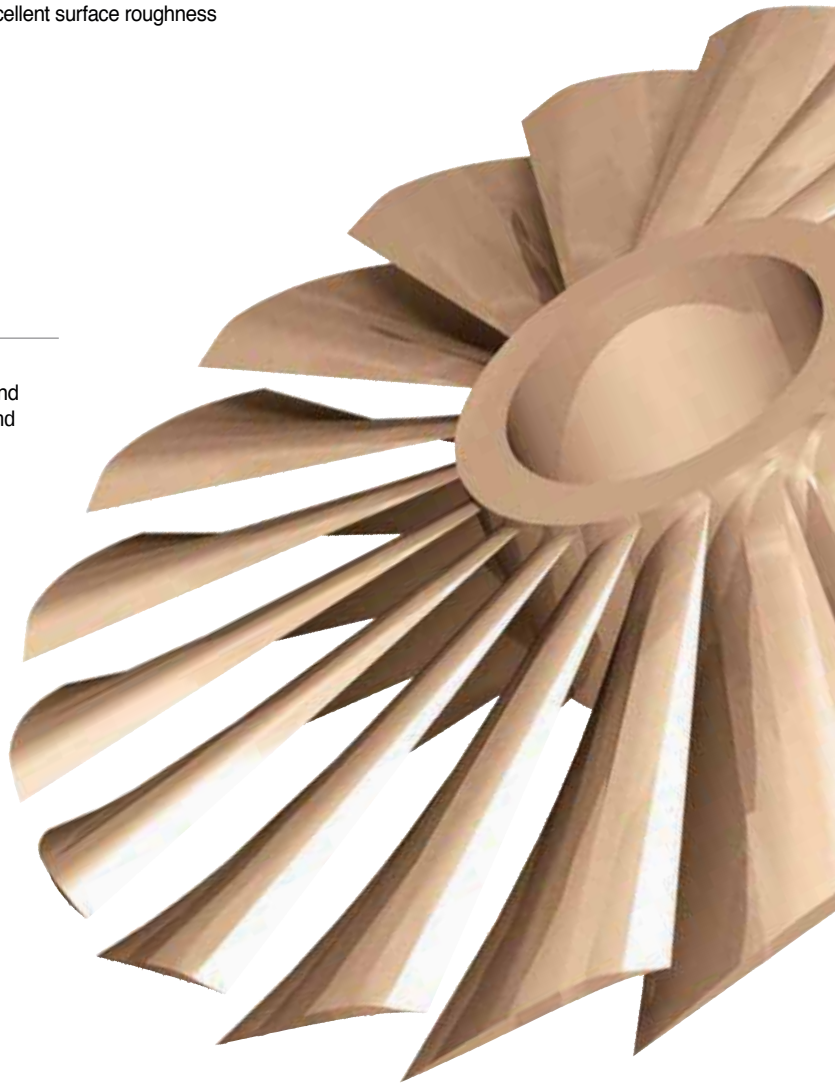


Aviation Industry (Engine / Turbine)

TPDBA

High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness



ISO Turning

- Available to customize whole and special items for complicated and various shape

Boring Bar

Internal Turning

- ISO standard boring bar for internal machining

I-Max

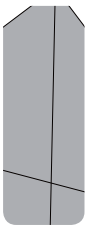
Solid end-mill for hard to cut material(IFSEA3000)

- High rake angle with helical flute provides excellent chip control
- Specially designed cutting edge applied to overcome work-hardening
- Best quality at the machining of hard to cut material

Rich Mill

- Increased number of edges and excellent tool life due to 8 corner edges
- Smooth cutting with low cutting load due to the unique geometry & high rake angle of cutting edge, this combination provides excellent tool life

MSDA



Long tool life with protecting material

- Good chip control with proper chip-pocket
- Decrease the chipping and increase the cutting ability due to applicable streamlined shape insert
- Increase impact resistance and lubrication due to apply PVD K Black coating on the sub-micron material

Laser Mill

Multi-functional indexable end-mill

- Extremely hard grade provides long tool life
- Easy and simple clamping of insert by using single screw
- Excellent quality for fine finishing due to its precise tolerance

H-Max

Solid end-mill for hard material

- Sub-micron carbide provides strength on sharp cutting edge preventing small chipping on it
- Advanced PVD coating having high hardness with strong anti-oxidation property coated on it provides excellent tool life as the machining of hard to cut material having high hardness

Aviation Industry (Landing Gear / Accessory)

HRMDouble

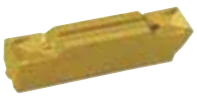
High efficient and cost effective tool utilizing a double sided insert

- Cost effective tool by using double sided insert with a total of 6 cutting edges
- Smooth cutting utilizing a high rake angle sharp cutting edge insert

MGT

For Grooving, Turning, Profiling, Cut-off

- Multi functional grooving tool can over variety of machining with multifunctional grooving tool and the chip breaker with excellent cutting perfomance and the ability to expand grooves



Pro-X Mill

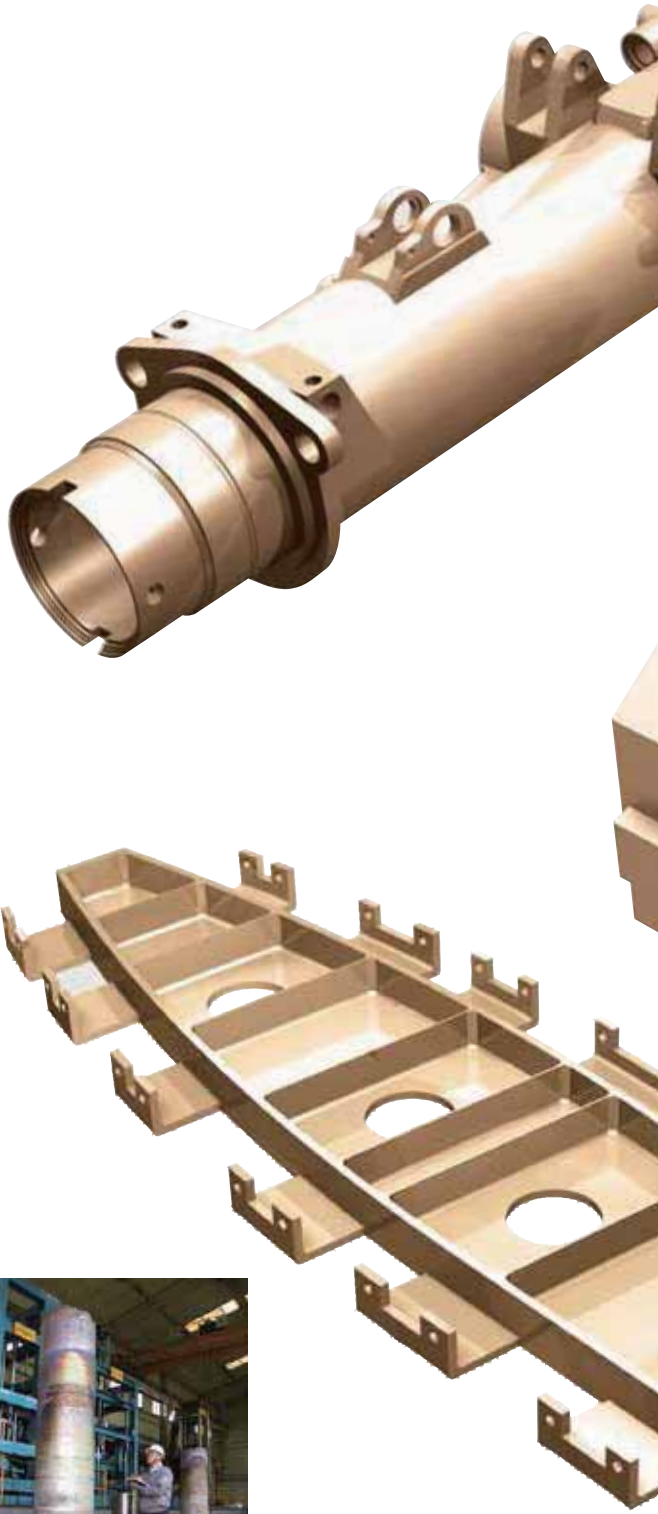
High-speed Aluminum Milling tool

- Unique mounting system of insert provides tight clamping of insert
- Mirror surface and high rake angle of insert provides excellent machined surface by reduced cutting load and edge build-up
- Grade: H01

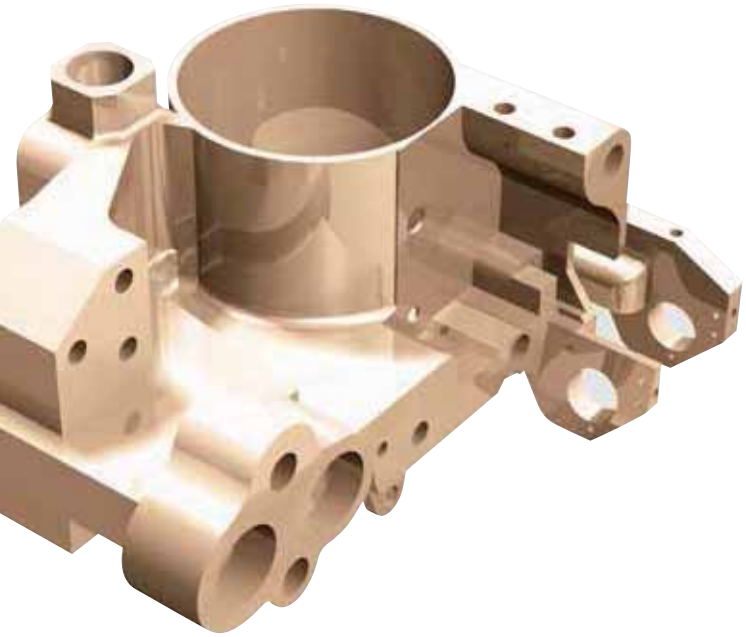
SSEA

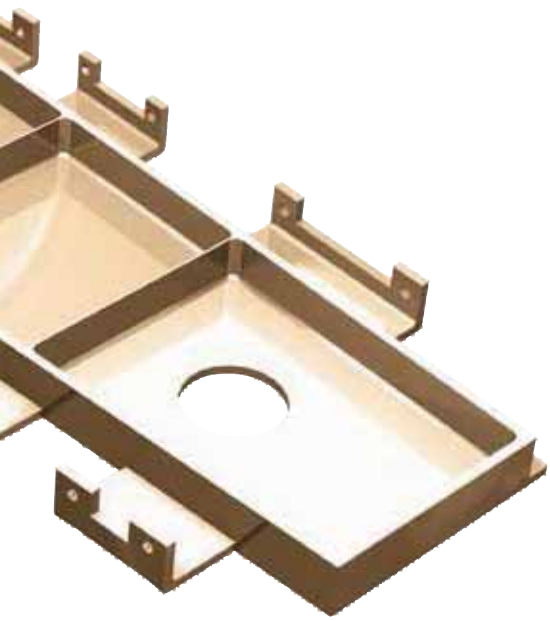
Solid carbide end-mill for Aluminum machining

- Advanced geometry of end-mill refrains build-up-edge
- Superior surface machined
- DLC coated end-mills available



Titanium
Picture provided : KPC Inc.





KING DRILL

Optimal indexable drill design

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- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

MLDA (Mach Long Drill)

- Direct drilling without separate operation (step drilling) over 20 x D
- Wider flute space along with drill provides effective chip control
- Special design for rigid body provides smooth drilling without bending of drill

Alpha Mill

Multi functional milling tool

- Vast coverage of milling operation due to its variety of cutters and inserts
- 3 dimensional chip breaker design provides smooth cutting

Brazed Endmill

- Apply High Spiral Angle (over 40 degrees) able to get good sharpness
- Available high speed milling due to reduce the working temperature
- Expected long tool life by applying hardened carbide material.
- Economical welded tool due to available 2 or 3 times re-grinding

Slitter Knife

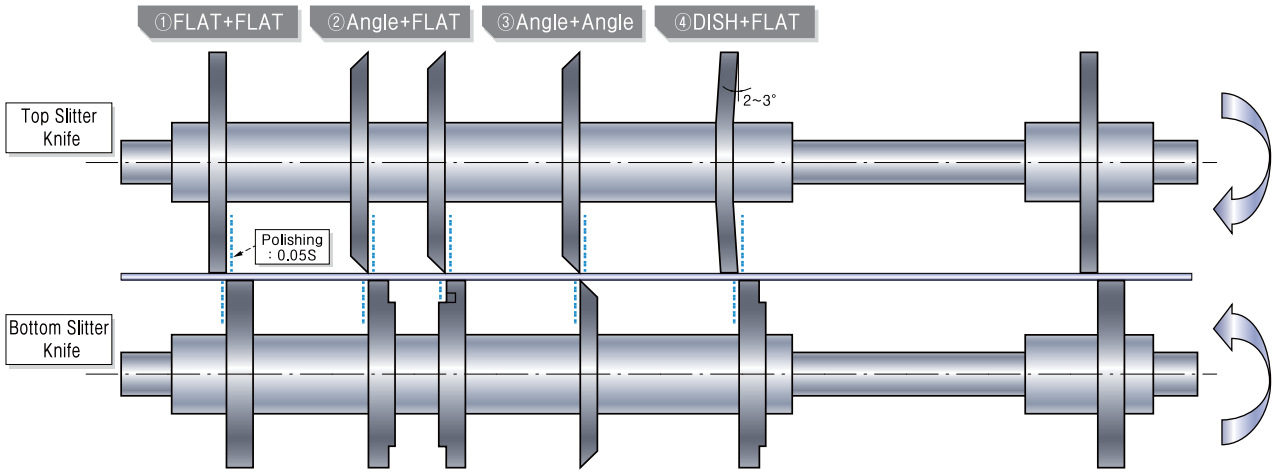
Application

- For video tape
- For audio tape
- For mangetic tape
- For brass plate, mobile battery

Tool selection

- Top slitter knife : Thickness : ±0.00039~0.00078(inch)
- Bottom slitter knife :Thickness : ±0.00004(inch)
  Flatness : under 0.00002(inch)
  Polishing surface roughness : under 0.05S

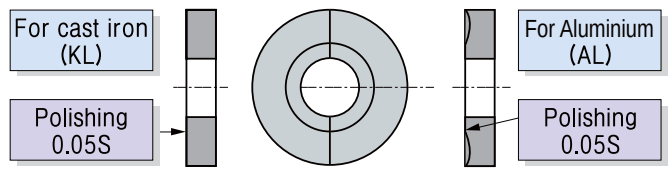
Machining example

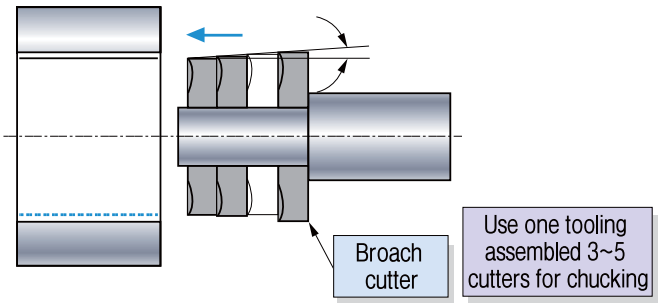


Broach cutter

Application

- Broach cutters apply to inner machining of metal bearing which is used for automobile crank shaft

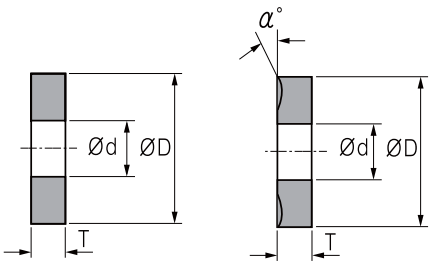




Order

- Designation for cast iron : KL Ød × Ød × T
- Designation for Aluminium : AL Ød × Ød × T
  : AL Ød × Ød × T × α°

(If there is no mentioned any angle, α = 30°)



Automobile engine tooling example (Crank Shaft)

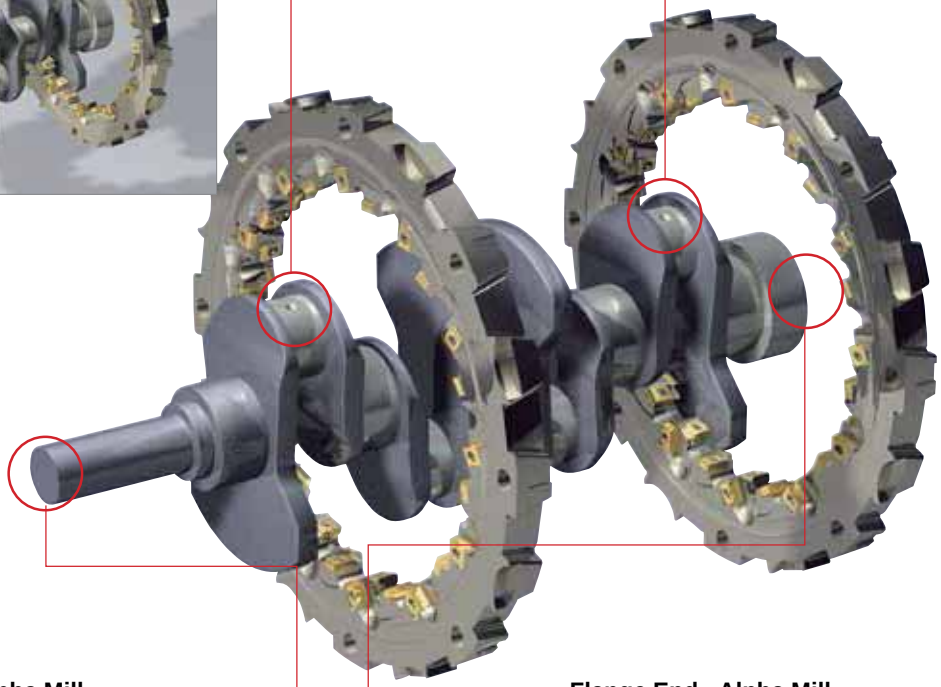
Oil Bore - Mach Long Drill(MLDA)

Taper Spline Structure
(Rigidity has been enhanced due to increased contact area)

Oil Bore - Mach Long Drill(MLDA)

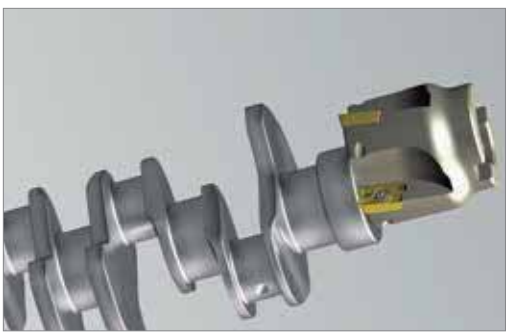
- Machining wihout step feed operation for deep hole drilling like 20D
- Optimal performance with MQL System

Pin & Journal - Crankshaft Cutter(Internal / External)



Post End - Alpha Mill

Flange End - Alpha Mill



Automobile tooling example (Knuckle)

Micro Boring bar

Mach Drill

Micro Boring bar

Indexable Side Cutter(SPBA)

Future Mill(FMPA)

Indexable Side Cutter(Tangential type)

Indexable Side Cutter(Radial type)

Future Mill(FMPA)

Step Drill

Drill(KING DRILL)

Automobile break tooling example (Carrier)

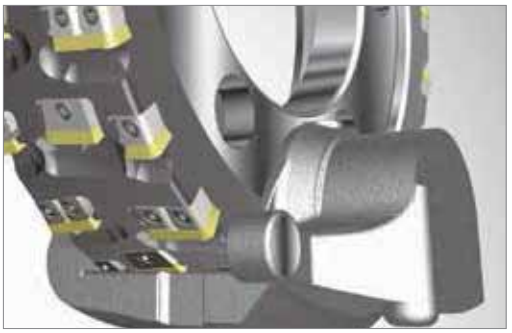
Drill

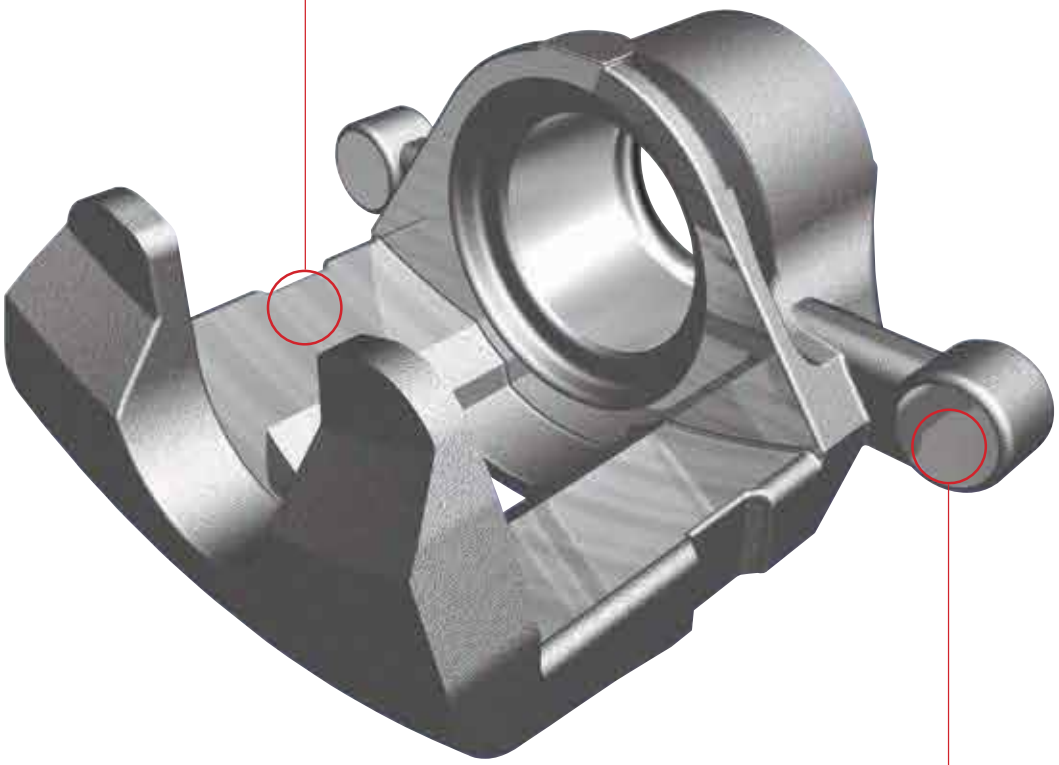
Drill

Side Cutter

Automobile break tooling example (Housing)

Side Cutter



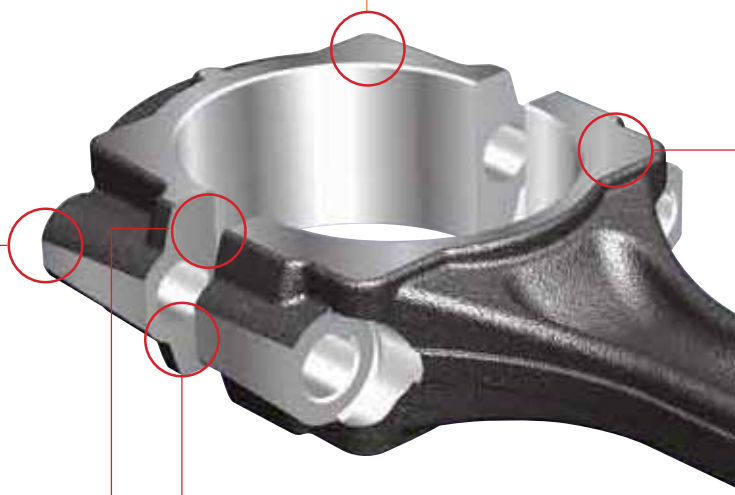


Side Cutter

Automobile tooling example (Connecting Rod)

Drill

Rich Mill(RM4)



Side Cutter

Side Cutter

Rich Mill(RM4)

Rich Mill(RM8)

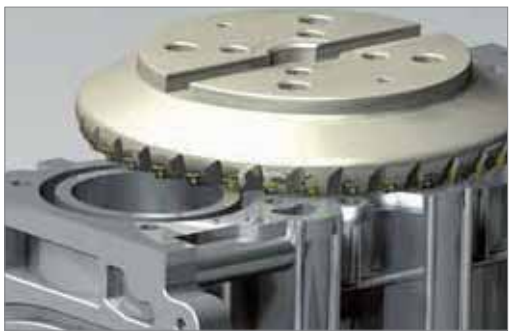
Drill(KING DRILL)

Step Drill

Drill

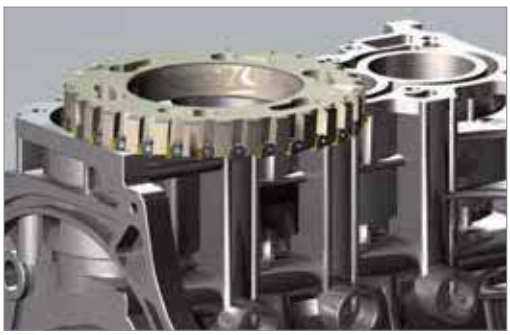
Automobile engine tooling example (Block)

Top Face (Roughing)

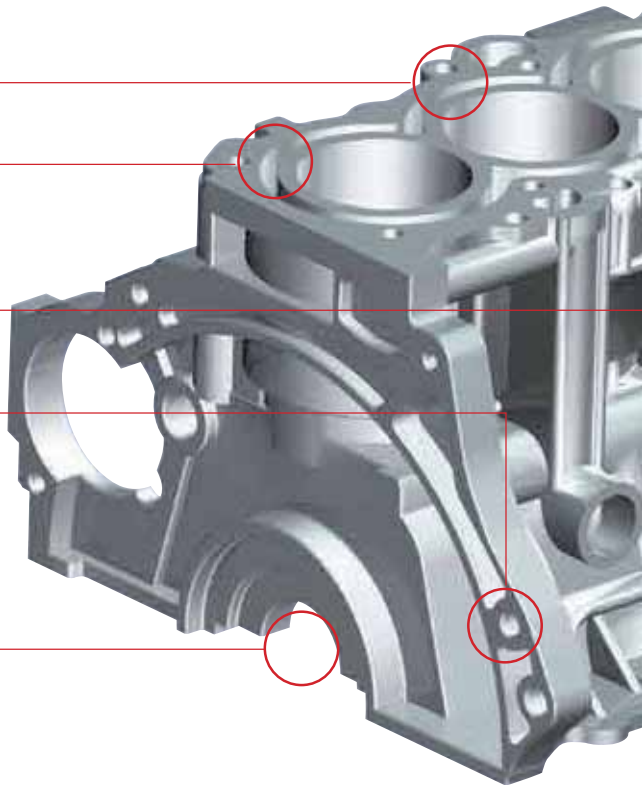


• Applied 8 corner edges of insert

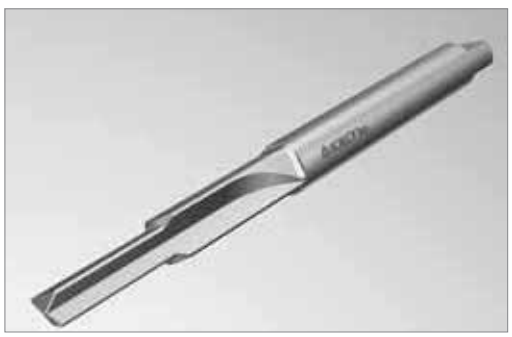
Top Face(Finishing) - High feed Cutter



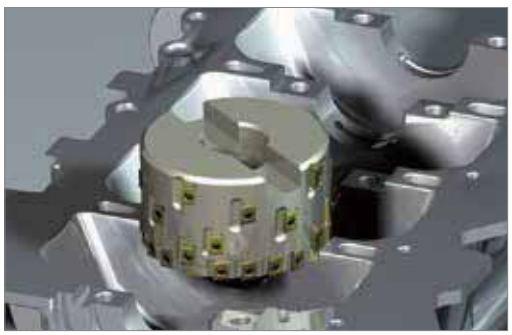
Bosses - Alpha Mill



Line Boring Bar Reamer

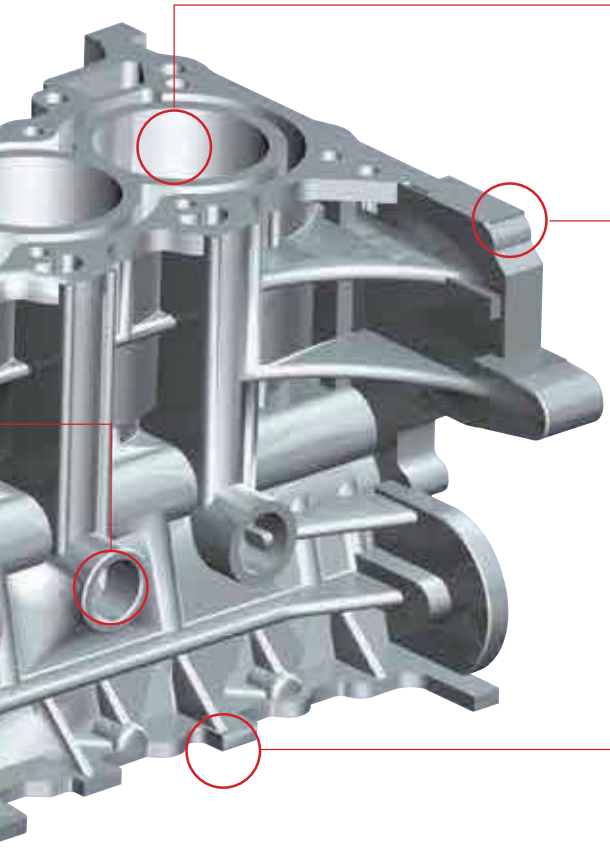


Bearing Cap Seat - Form Cutter

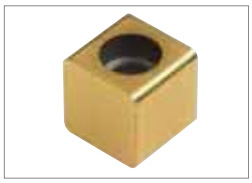


Crank Bore(Crankshaft Bearing Bore) - Form Cutter

Cylinder Bore(Roughing) - Boring Cutter

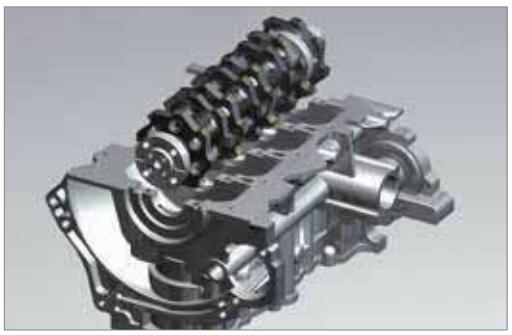


Front & Rear Face - Cube Couple Mill



- High feed cutter made of aluminum
- Due to light weight, it s easy to handle & effective to prevent accident

Cheek Faces - Gang Cutter



Cheek Faces - Gang Cutter

Automobile engine tooling example (Head)

Top Face(Roughing & Finishing) - High Feed Cutter

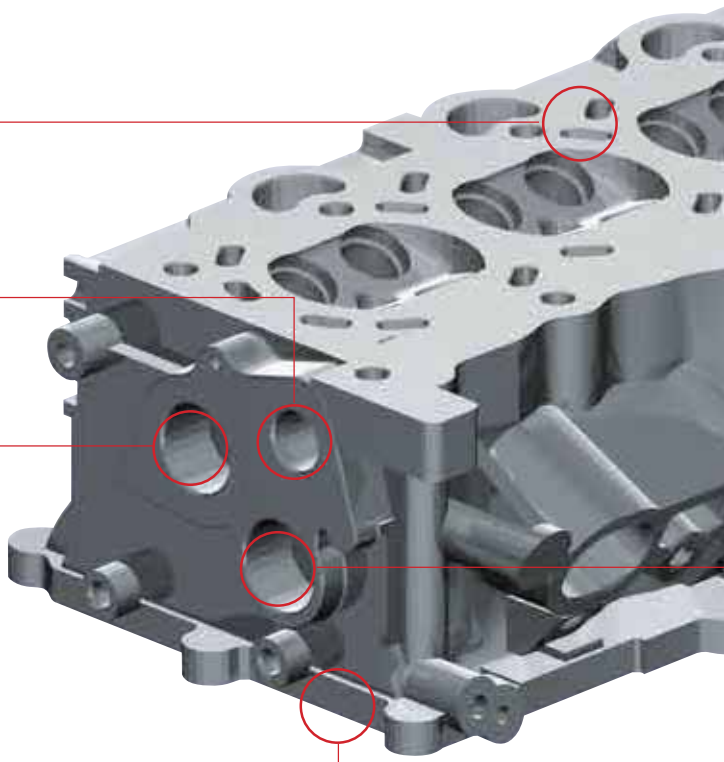
• Carbide insert, PCD insert

Top Face(Roughing & Finishing) - Aero Mill

• Due to the light weight of aluminum body that about 50% of steel body, excellent cutting performance with high speed machining can be achieved.

Step Burnishing Reamer

Straight Reamer

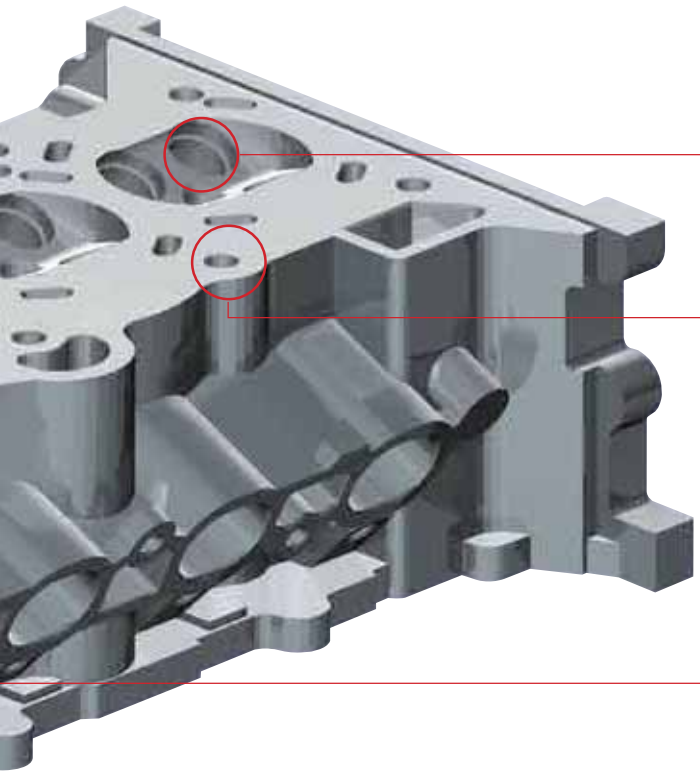


Bottom Face(Roughing & Finishing) - High feed Cutter

• Carbide insert, PCD insert

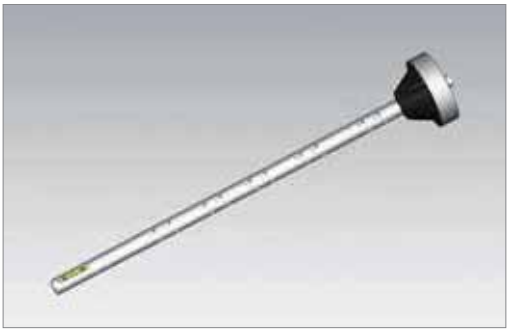
Counter Bore Tool

Valve Seat - Apolo Cutter(Special Boring Holder)



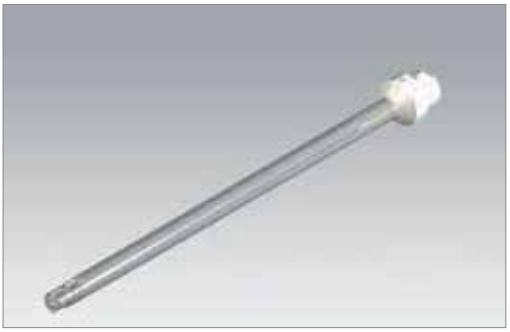
Top Face(Drilling) - Mach Drill

Cam Shaft Bearing Seat - Line Boring Bar



• Stable machining at high speed without chattering

Cam Journal Bore - High Speed Reamer



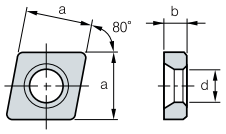
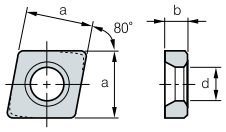
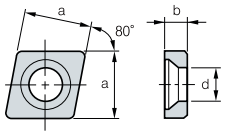
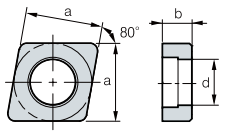
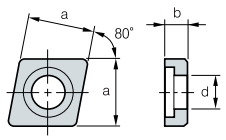
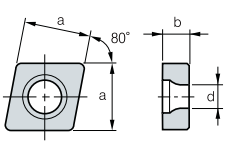
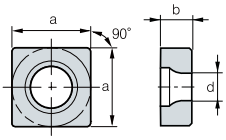
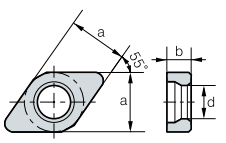
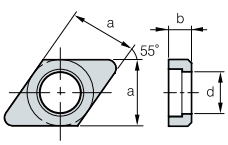
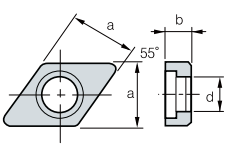
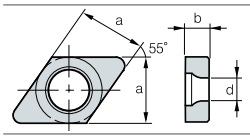
• Available for high speed machining
• Excellent surface finish & roundness

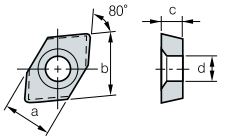
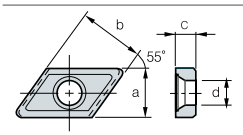
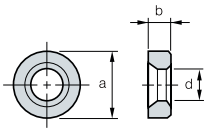
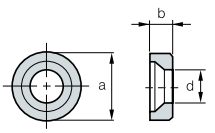
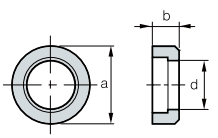
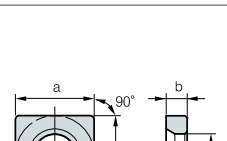
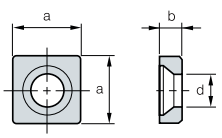
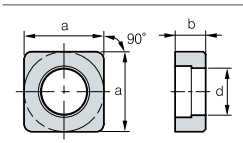
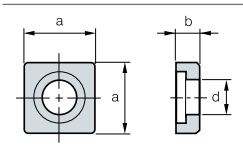
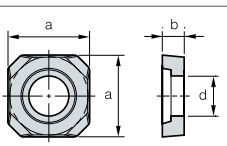
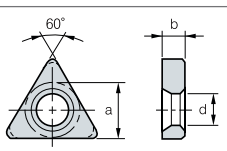
PARTS

K

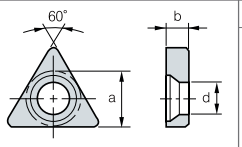
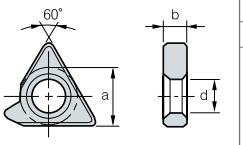
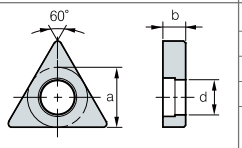
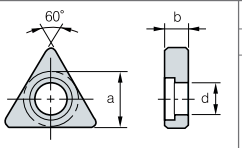
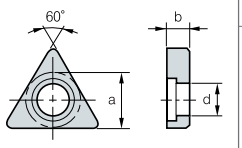
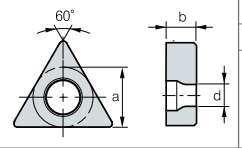
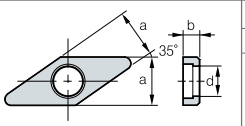
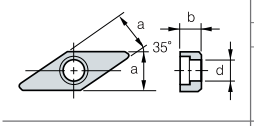
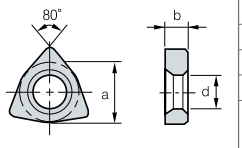
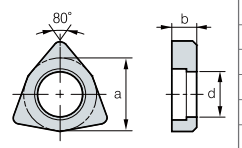
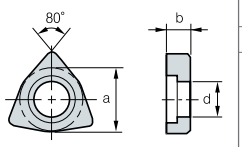
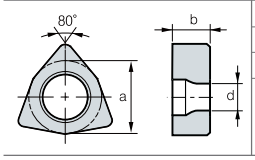
PARTS

Shim

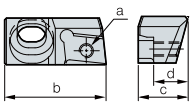
Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SC32	0.335	0.125		0.193	
	SC32N	0.335	0.125		0.192	
	SC42	0.492	0.125		0.272	
	SC42N	0.457	0.125		0.256	
	SC53	0.618	0.187		0.311	
	SC53N	0.575	0.187		0.319	
	SC63	0.742	0.187		0.394	
	SC63N	0.701	0.187		0.378	
	SC83	0.961	0.187		0.504	
	SC84N	0.953	0.250		0.512	
	SC42B	0.492	0.125		0.272	
	SC42CC	0.492	0.125		0.138	
	SC32D	0.365	0.125		0.255	
	SC43D	0.490	0.187		0.289	
	SC53D	0.615	0.187		0.380	
	SC63D	0.740	0.187		0.443	
	SC84D	0.987	0.250		0.585	
	SC42S	0.453	0.125		0.252	
	SC32S	0.327	0.125		0.213	
	SC63V	0.722	0.187		0.217	
	SC83V	0.996	0.187		0.258	
	SC84V	0.996	0.250		0.250	
	SC32V	0.359	0.125		0.134	
	SC42V	0.496	0.125		0.177	
	SC44V	0.496	0.250		0.177	
	SC54V	0.620	0.250		0.217	
	SS32V	0.359	0.125		0.134	
	SS42V	0.496	0.125		0.177	
	SS54V	0.620	0.250		0.217	
	SS64V	0.744	0.250		0.217	
	SD317	0.368	0.106		0.205	
	SD32N	0.335	0.125		0.192	
	SD42	0.492	0.125		0.272	
	SD42N	0.457	0.125		0.256	
	SD43N	0.457	0.187		0.256	
	SD32D	0.362	0.125		0.228	
	SD43D	0.490	0.187		0.289	
	SD32S	0.335	0.125		0.213	
	SD42S	0.453	0.125		0.252	
	SD32V	0.359	0.125		0.134	
	SD43V	0.496	0.187		0.177	
	SD44V	0.496	0.250		0.177	

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SES33C	0.358	0.472	4.76	0.138	
	SK33C	0.367	0.579	4.8	0.138	
	SK33CL	0.367	0.579	4.8	0.138	
	SR10	0.331	0.125		0.185	
	SR12	0.394	0.125		0.185	
	SR16	0.533	0.187		0.272	
	SR20	0.673	0.191		0.311	
	SR25	0.866	0.250		0.378	
	SR32	1.094	0.250		0.512	
	SR42CC	0.495	0.125		0.138	
	SR10S	0.346	0.125		0.213	
	SR12S	0.415	0.125		0.213	
	SS32	0.335	0.125		0.193	
	SS32N	0.335	0.125		0.192	
	SS42	0.492	0.125		0.272	
	SS42B	0.492	0.125		0.272	
	SS42N	0.457	0.125		0.256	
	SS53	0.618	0.187		0.311	
	SS53N	0.575	0.187		0.319	
	SS63	0.742	0.187		0.394	
	SS63N	0.701	0.187		0.378	
	SS84	0.961	0.250		0.504	
	SS84N	0.953	0.250		0.512	
	SS42CC	0.492	0.125		0.138	
	SS32CC	0.366	0.125		0.138	
	SS32D	0.365	0.125		0.227	
	SS43D	0.490	0.187		0.289	
	SS53D	0.615	0.187		0.380	
	SS63D	0.740	0.187		0.443	
	SS84D	0.990	0.250		0.568	
	SS32S	0.327	0.125		0.213	
	SS42S	0.453	0.125		0.252	
	SS42SAF	0.441	0.118		0.217	
	ST317	0.368	0.106		0.197	
	ST317B	0.368	0.106		0.197	
	ST317N	0.335	0.106		0.192	
	ST42	0.492	0.125		0.272	
	ST42N	0.457	0.125		0.256	
	ST53	0.618	0.187		0.311	

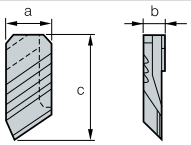
Shim

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	ST32CC	0.368	0.125		0.138	
	ST32C1	0.359	0.125		0.195	
	ST42C1	0.484	0.125		0.195	
	ST32D	0.368	0.125		0.227	
	ST43D	0.493	0.187		0.289	
	ST53D	0.618	0.187		0.380	
	ST63D	0.743	0.187		0.443	
	ST32M	0.343	0.125		0.185	
	ST43M	0.492	0.187		0.248	
	ST32S	0.335	0.125		0.213	
	ST32V	0.359	0.243		0.134	
	ST44V	0.496	0.250		0.177	
	SV32D	0.362	0.125		0.228	
	SV43D	0.484	0.187		0.289	
	SV32D2	0.362	0.125		0.228	
	SV32S	0.331	0.125		0.213	
	SW317	0.368	0.106		0.197	
	SW317N	0.335	0.106		0.192	
	SW42	0.492	0.125		0.272	
	SW42N	0.457	0.125		0.256	
	SW32D	0.364	0.125		0.228	
	SW43D	0.490	0.187		0.289	
	SW53D	0.615	0.187		0.380	
	SW63D	0.740	0.187		0.443	
	SW84D	0.980	0.250		0.568	
	SW43M	0.492	0.187		0.244	
	SW32M	0.335	0.125		0.205	
	SW32V	0.359	0.125		0.134	
	SW44V	0.496	0.250		0.177	
	SW54V	0.620	0.187		0.217	

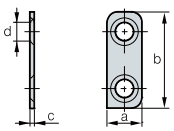
Cartridge

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	LAPDR-AJ	M4×0.7	1.181	0.591	0.394	

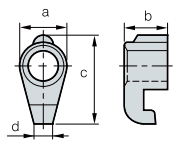
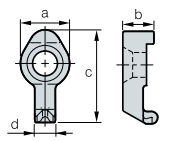
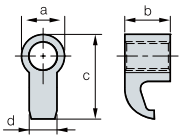
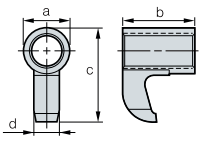
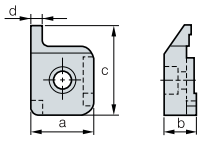
Chip Breaker

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CB20	0.335	0.134	0.787		

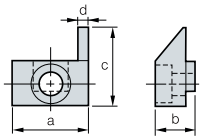
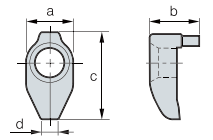
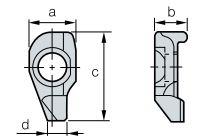
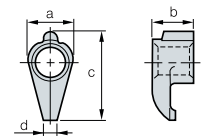
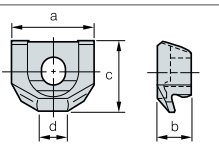
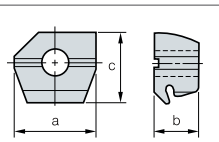
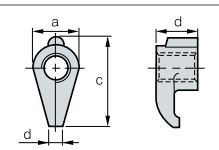
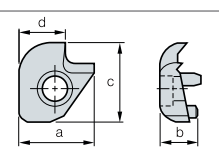
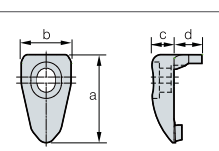
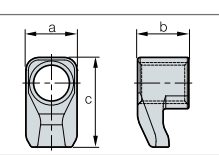
Chip Cover

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CFMP3R14R1-A	0.413	0.787	0.039	(ø0.169)	
	CFMP3R-A	0.315	0.709	0.039	(ø0.169)	
	CFMP4R-A	0.315	0.866	0.039	(ø0.169)	

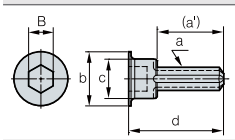
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CA05R	0.350	0.217	0.693	0.130	
	CA06R	0.472	0.283	0.811	0.209	
	CH5R3	0.309	0.283	0.583	0.122	
	CH6R4	0.473	0.354	0.944	0.148	
	CBH4.5R1	0.315	0.226	0.697	0.157	
	CBH4.5R2	0.374	0.252	0.709	0.157	
	CBH5R1	0.394	0.307	0.839	0.197	
	CBH6R1	0.472	0.366	1.024	0.236	
	CDH6N	0.374	0.394	0.732	0.240	
	CDH7N	0.311	0.449	0.579	0.185	
	CDH8N	0.429	0.665	0.882	0.240	
	CDH8N1	0.429	0.665	0.752	0.240	
	CDH8N2	0.429	0.665	1.000	0.240	
	CDH8N3	0.492	0.780	1.000	0.362	
	CDS8N	0.425	0.669	0.874	0.197	
	CGH5R1	0.768	0.374	1.134	0.098	
	CGH5R2	0.807	0.374	1.134	0.138	
	CGH5R3	0.886	0.374	1.134	0.217	

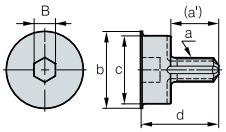
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CGH6R1	0.878	0.469	0.913	0.098	
	CGH6R2	0.913	0.469	0.913	0.134	
	CGH6R3	0.945	0.469	0.913	0.165	
	CHH3.5R1	0.295	0.264	0.512	0.096	
	CHH4.5R1	0.311	0.309	0.555	0.100	
	CHH5.5R1	0.386	0.394	0.646	0.157	
	CH4R1	0.291	0.197	0.555	0.122	
	CH5R1	0.394	0.260	0.795	0.177	
	CH5R2	0.270	0.276	0.543	0.079	
	CH6R2	0.348	0.343	0.650	0.079	
	CH6R3	0.465	0.394	0.906	0.165	
	CMH5R1	0.728	0.311	0.630	0.246	
	CMH6R2	0.787	0.433	0.689	0.543	
	CMH6R6	0.728	0.311	0.630	0.246	
	CMH6R1	0.945	0.335	0.650	0.326	
	CMH6R3	0.787	0.433	0.689		
	CMH6L3	0.787	0.433	0.689		
	CS5R1	0.268	0.276	0.571	0.079	
	CS6R1	0.346	0.335	0.713	0.106	
	CS8R1	0.465	0.394	0.906	0.165	
	CTH6L1	0.925	0.472	1.000	0.565	
	CTH6R1	0.925	0.472	1.000	0.565	
	CTH6R2	0.857	0.508	1.229	0.682	
	CVH3	0.827	0.433	0.228	0.303	
	CVH3V	1.142	0.551	0.276	0.315	
	CVH4	1.004	0.571	0.236	0.276	
	CVH5	1.181	0.669	0.295	0.374	
	CVH6	1.319	0.728	0.315	0.394	
	CXH8N	0.398	0.394	0.689		

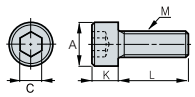
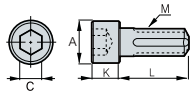
Coolant Bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA063-3IN/MM	M10	ø0.984	ø0.630	1.457	0.315	(1.063)
	CBA063-4IN/MM	M10	ø0.984	ø0.630	1.673	0.315	(1.063)
	CBA080-IN/MM	M12	ø1.102	ø0.709	1.791	0.394	(1.260)
	CBP063-IN/MM	M10	ø0.866	ø0.630	1.520	0.315	(1.063)
	CBP080-IN/MM	M12	ø0.984	ø0.709	1.913	0.394	(1.260)

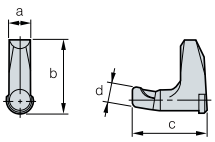
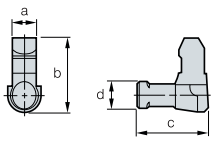
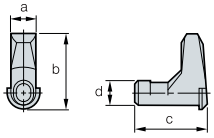
Coolant Bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA100-IN/MM	M16	ø2.126	ø1.693	1.850	0.551	(1.260)
	CBA100-IN-25.4	M12	ø1.732	ø1.417	1.634	0.394	(0.984)
	CBA125-IN	M20	ø2.559	ø2.126	2.205	0.669	(1.496)
	CBA125-IN-25.4	M12	ø1.732	ø1.417	1.713	0.394	(0.984)
	CBA125-MM	M20	ø2.559	ø2.126	2.244	0.669	(1.378)
	CBA160-IN	M24	ø3.268	ø2.874	2.205	0.748	(1.496)
	CBA160-MM	M20	ø3.268	ø2.874	2.087	0.669	(1.339)
	CBP100-IN	M16	ø1.969	ø1.693	1.913	0.551	(1.260)
	CBP100-IN-25.4	M12	ø1.732	ø1.417	1.831	0.394	(0.984)
	CBP100-MM-1	M16	ø1.969	ø1.693	1.913	0.551	(1.417)
	CBP125-IN	M20	ø2.559	ø2.126	2.205	0.669	(1.496)
	CBP125-IN-25.4	M12	ø1.732	ø1.417	2.165	0.394	(0.984)
	CBP125-MM	M20	ø2.559	ø2.126	2.244	0.669	(1.378)
	CBP125-MM-1	M20	ø2.402	ø2.126	2.583	0.551	(1.299)
	CBP160-IN	M24	ø3.268	ø2.874	2.205	0.748	(1.496)
	CBP160-MM	M20	ø3.268	ø2.874	2.087	0.669	(1.339)

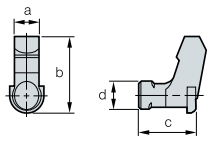
Wrench Bolt

Geometry	Designation	Dimensions				
		A	C	K	L	M
	SB0825	0.512	0.236	0.315	0.984	M08 × 1.25
	SB1025	0.630	0.315	0.394	0.984	M10 × 1.50
	SB1035	0.630	0.315	0.394	1.378	M10 × 1.50
	SB1230	0.709	0.394	0.472	1.181	M12 × 1.75
	SB1630	0.945	0.551	0.630	1.181	M16 × 2.0
	SB1645	0.945	0.551	0.630	1.772	M16 × 2.0
	SB2040	1.181	0.669	0.787	1.575	M20 × 2.5
	CB1025	0.512	0.236	0.315	0.984	M08×1.25
	CB1025	0.630	0.315	0.394	0.984	M10×1.50
	CB1035	0.630	0.315	0.394	1.378	M10×1.50
	CB1230	0.709	0.394	0.472	1.181	M12×1.75
	CB1245	0.709	0.394	0.472	1.772	M12×1.75
	CB1630	0.945	0.551	0.630	1.181	M16×2.0
	CB1645	0.945	0.551	0.630	1.772	M16×2.0
	CB2040	1.181	0.669	0.787	1.575	M20×2.5

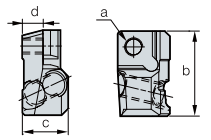
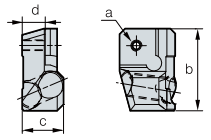
Lever

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	LR10	0.134	0.425	0.461	0.118	
	LR12	0.146	0.531	0.528	0.138	
	LR16	0.187	0.736	0.720	0.169	
	LR20	0.232	0.807	0.736	0.219	
	LR25	0.289	0.955	0.933	0.244	
	LR32	0.333	1.169	1.061	0.311	
	LV2	0.102	0.305	0.236	0.083	
	LV3B	0.122	0.394	0.374	0.146	
	LV4B	0.185	0.573	0.614	0.185	
	LV4BN	0.185	0.630	0.587	0.184	
	LV3	0.146	0.394	0.472	0.142	
	LV3N	0.148	0.394	0.472	0.140	
	LV3AN	0.148	0.476	0.449	0.183	
	LV3C	0.122	0.394	0.309	0.142	
	LV3CN	0.126	0.394	0.307	0.142	
	LV3D	0.122	0.461	0.374	0.142	
	LV3DN	0.126	0.459	0.374	0.140	
	LV4	0.185	0.573	0.551	0.185	
	LV4N	0.185	0.530	0.520	0.184	
	LV5	0.236	0.673	0.669	0.236	
	LV5N	0.236	0.646	0.672	0.234	
	LV5AN	0.236	0.741	0.681	0.234	
	LV6N	0.295	0.807	0.827	0.299	
	LV8N	0.339	1.004	1.000	0.339	

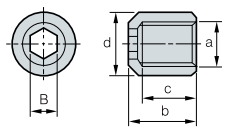
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LV4A	0.181	0.521	0.392	0.185
	LV4AN	0.185	0.524	0.394	0.184

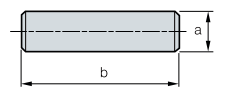
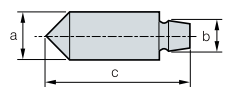
Locator

Geometry	Designation	Dimensions			
		a	b	c	d
	LFMP3R-A	M3.5	0.736	0.398	0.181
	LFMP4R1-A	M4.5	0.957	0.543	0.244
	LFMP4R-A	M4.5	1.035	0.543	0.244
	LFMA3R-A	M3	0.728	0.374	0.189
	LFMA4R-A	M3.5	1.024	0.516	0.287

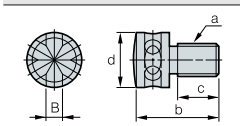
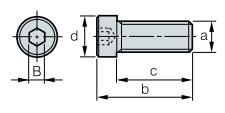
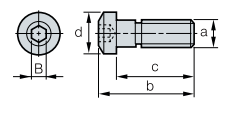
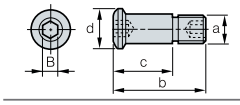
Nut

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	N0407	M4 X 0.7	0.295	0.236	0.276	0.118	
	N0508	M5 X 0.8	0.327	0.260	0.276	0.118	

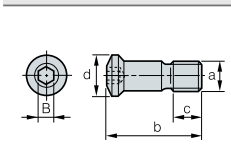
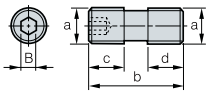
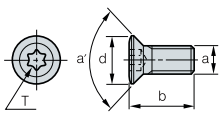
Pin

Geometry	Designation	Dimensions		
		a	b	c
	PN0308	0.118	0.315	
	PN0310	0.118	0.394	
	PN0312	0.118	0.472	
	PN0314	0.118	0.551	
	PN0515	0.189	0.130	0.571

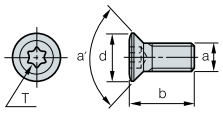
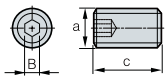
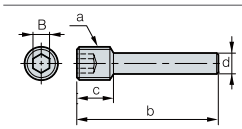
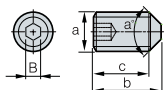
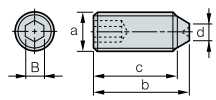
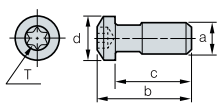
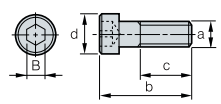
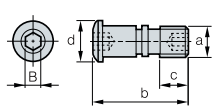
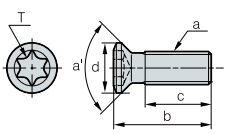
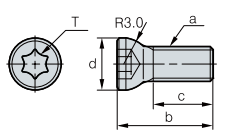
Screw

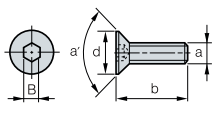
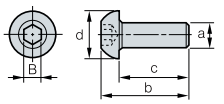
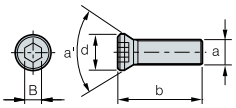
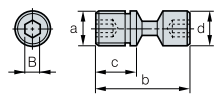
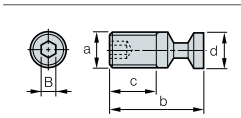
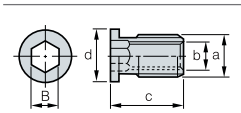
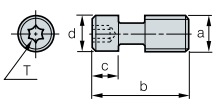
Geometry	Designation	Dimensions				
		a	b	c	d	B(T)
	AZ0508F	M5 X 0.5	0.512	0.315	0.354	ø0.079
	AZ0514	M5 X 0.8	0.551	0.276	0.354	ø0.098
	BHA0510	M5 X 0.8	0.591	0.394	0.335	0.157
	BHA0512	M5 X 0.8	0.669	0.472	0.335	0.157
	BHA0612	M6 X 1.0	0.709	0.472	0.394	0.197
	BHA0614	M6 X 1.0	0.787	0.551	0.394	0.197
	BHA0616	M6 X 1.0	0.866	0.630	0.394	0.197
	BHA0619-NYLOK	M6 X 1.0	0.984	0.748	0.394	0.197
	CHX0407	M4 X 0.7	0.374	0.290	0.224	0.098
	CHX0415	M4 X 0.7	0.689	0.591	0.213	0.098
	CHX0510	M5 X 0.8	0.516	0.398	0.303	0.118
	CHX0518	M5 X 0.8	0.846	0.709	0.315	0.118
	CHX0622	M6 X 1.0	1.043	0.866	0.394	0.157
	CHX0513	M5 X 0.8	0.512	0.315	0.252	0.098
	CHX0616	M6 x 1.0	0.638	0.398	0.335	0.118
	CHX0617L	M6 x 1.0(Left)	0.677	0.398	0.335	0.118
	CHX0621	M6 X 1.0	0.827	0.398	0.335	0.118

Screw

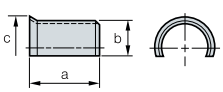
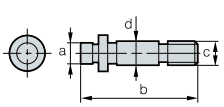
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CHX0625	1/4-20UNC	0.976	0.433	0.394	0.157	
	CTX03510	M3.5 X 0.6	0.394	0.185	0.209	0.591	
	CTX04513	M4.5 X 0.75	0.516	0.272	0.268	0.787	
	CTX04513H	M4.5 X 0.75	0.516	0.283	0.268	0.787	
	CTX0515	M5 X 0.8	0.591	0.315	0.276	0.787	
	CTX0517	M5 X 0.8	0.689	0.394	0.276	0.787	
	CTX0621	M6 X 1.0	0.835	0.488	0.354	0.984	
	DHA0514	M5 X 0.8	0.551	0.197	0.276	0.098	
	DHA0617	M6 x 1.0	0.669	0.276	0.295	0.118	
	DHA0620	M6 x 1.0	0.787	0.315	0.315	0.118	
	DHA0624	M6 x 1.0	0.945	0.472	0.335	0.118	
	DHA0815	M8 X 1.25	0.610	0.246	0.246	0.157	
	DHA0818F	M8 X 1.0	0.709	0.335	0.217	0.157	
	DHA0820	M8 X 1.25	0.787	0.315	0.354	0.157	
	DHA0821F	M8 X 1.0	0.827	0.335	0.335	0.157	
	DHA0825	M8 X 1.25	0.984	0.394	0.354	0.157	
	DHA0830	M8 X 1.25	1.181	0.453	0.453	0.157	
	ETGA0520CBM	M5 X 0.8	0.787		0.256	0.787	43°
	ETGD0825	M8 X 1.25	0.992		0.437	1.575	40°
	ETKA0523	M5 X 0.8	0.906		0.299	0.787	43°
	ETKA0625	M6 X 1.0	1.004		0.346	0.787	43°
	ETKD0516	M5 X 0.8	0.646		0.268	0.787	40°
	ETKD0620	M6 X 1.0	0.787		0.327	1.181	40°
	ETNA02506	M2.5 X 0.45	0.224		0.134	0.276	43°
	ETNA0408	M4 X 0.7	0.315		0.201	0.591	43°
	ETNA0412	M4 X 0.7	0.472		0.201	0.591	43°
	ETNA0511	M5 X 0.8	0.433		0.252	0.787	43°
	ETND02506F	M2.5 X 0.35	0.246		0.122	0.276	40°
	ETND0307F	M3 X 0.35	0.307		0.146	0.315	40°
	ETND03509	M3.5 X 0.6	0.378		0.185	0.394	40°
	FTGA03507	M3.5 X 0.6	0.276		0.209	0.591	60°
	FTGA03508	M3.5 X 0.6	0.315		0.209	0.591	60°
	FTGA03510	M3.5 X 0.6	0.394		0.209	0.591	60°
	FTGA03512	M3.5 X 0.6	0.472		0.197	0.591	60°
	FTGA0411F	M4 X 0.5	0.433		0.276	0.591	60°
	FTGA0417CBM	M4 X 0.7	0.669		0.217	0.591	62°
	FTGA0510-P	M5 X 0.8	0.394		0.276	0.787	63°
	FTGA0512-P	M5 X 0.8	0.472		0.276	0.787	63°
	FTGA0513	M5 X 0.8	0.520		0.276	0.787	61°
	FTGA0513-P	M5 X 0.8	0.512		0.276	0.787	63°
	FTGA0517	M5 X 0.8	0.669		0.295	0.787	61°
	FTGA0621	M6 X 1.0	0.846		0.354	0.787	61°
	FTGA0826	M8 X 1.25	1.024		0.457	0.984	61°
	FTKA02206	M2.2 X 0.45	0.217		0.118	0.236	60°
	FTKA02206S	M2.2 X 0.45	0.220		0.120	0.276	60°
	FTKA02555	M2.5 X 0.45	0.217		0.138	0.276	60°
	FTKA02565	M2.5 X 0.45	0.256		0.138	0.276	60°
	FTKA02565S	M2.5 X 0.45	0.256		0.150	0.315	60°
	FTKA0307	M3 X 0.5	0.283		0.165	0.354	60°
	FTKA03508	M3.5 X 0.6	0.331		0.217	0.591	60°
	FTKA03510	M3.5 X 0.6	0.409		0.217	0.591	60°
	FTKA03511A	M3.5 X 0.6	0.433		0.205	0.591	60°
	FTKA0408	M4 X 0.7	0.331		0.217	0.591	60°
	FTKA0410	M4 X 0.7	0.394		0.217	0.591	60°
	FTKA0411K	M4 X 0.7	0.433		0.268	0.591	60°
	FTKA0412B	M4 X 0.7	0.492		0.217	0.591	60°
	FTKA0413	M4 X 0.7	0.512		0.217	0.591	60°
	FTNA01633	M1.6 X 0.35	0.130		0.102	0.236	60°
	FTNA0203	M2 X 0.4	0.118		0.106	0.236	60°
	FTNA02033	M2 X 0.4	0.130		0.106	0.236	60°
	FTNA0204	M2 X 0.4	0.169		0.106	0.236	60°
	FTNA02205	M2.2 X 0.45	0.177		0.118	0.236	60°
	FTNA0238	M2 X 0.4	0.150		0.118	0.236	60°
	FTNA0305	M3 X 0.5	0.205		0.165	0.354	60°
	FTNA0306	M3 X 0.5	0.244		0.165	0.354	60°
	FTNA0307	M3 X 0.5	0.283		0.165	0.354	60°
	FTNA0408	M4 X 0.7	0.335		0.217	0.591	60°
	FTNA0411	M4 X 0.7	0.433		0.217	0.591	60°
	FTNA0511	M5 X 0.8	0.276	0.433	0.264	0.787	63°
	FTNA0513	M5 X 0.8	0.512		0.276	0.787	60°
	FTNA0516	M5 X 0.8	0.630		0.276	0.787	60°

Screw

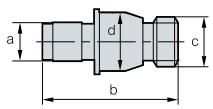
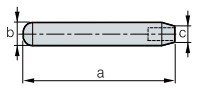
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	FTNB0411	M4 X 0.7	0.425		0.224	0.591	60°
	FTNC04509	M4.5 X 0.75	0.374		0.268	0.787	55°
	FTNC04511	M4.5 X 0.75	0.453		0.268	0.787	55°
	KHA0508	M5 X 0.8	0.315			0.098	
	KHA0510	M5 X 0.8	0.394			0.098	
	KHA0610	M6 X 1.0	0.394			0.118	
	KHA0612	M6 X 1.0	0.472			0.118	
	KHA0812	M8 X 1.25	0.472			0.157	
	KHA0815	M8 X 1.25	0.591			0.157	
	KHA1015	M10 X 1.5	0.591			0.197	
	KHA1020	M10 X 1.5	0.787			0.197	
	KHB0417	M4 X 0.7	0.677	0.177	0.098	0.079	
	KHB0406	M4 X 0.7	0.236	0.165	0.118	0.079	
	KHC0510	M5 X 0.8	0.394	0.319		0.098	90°
	KHC0610	M6 X 1.0	0.394	0.307		0.118	90°
	KHC0812	M8 X 1.25	0.472	0.354		0.157	90°
	KHC1016	M10 X 1.5	0.630	0.484		0.197	90°
	KHC1020	M10 X 1.5	0.787	0.642		0.197	90°
	KHD0510	M5 X 0.8	0.394	0.354	0.118	0.098	
	KHD0610	M6 X 1.0	0.394	0.394	0.157	0.118	
	KHD0810	M8 X 1.25	0.394	0.394	0.295	0.157	
	LTX0512	M5 X 0.8	0.594	0.472	0.287	0.787	
	LTX0514	M5 X 0.8	0.673	0.551	0.287	0.787	
	MHA0512	M5 X 0.8	0.669	0.425	0.315	0.157	
	MHB0310	M3 X 0.5	0.528	0.315	0.217	0.098	
	MHB0410	M4 X 0.7	0.551	0.315	0.276	0.118	
	MHB1055	M10 X 1.5	2.559	1.969	0.630	0.315	
	MHB1260	M12 X 1.75	2.835	2.165	0.709	0.394	
	MHB1680	M16 X 2.0	3.780	2.953	0.945	0.551	
	MHX0523	M5 X 0.8	0.925	0.382	0.394	0.098	
	MHX0626	M6 X 1.0	1.016	0.394	0.433	0.118	
	MHX0630	M6 X 1.0	1.181	0.492	0.413	0.157	
	PTKA02508	M2.5 X 0.45	0.315	0.197	0.150	0.315	92°
	PTKA03510	M3.5 X 0.6	0.394	0.197	0.197	0.591	92°
	PTKA0407	M4 X 0.7	0.276	0.181	0.217	0.591	86°
	PTKA0407F	M4 X 0.5	0.287	0.150	0.256	0.591	91°
	PTKA0408	M4 X 0.7	0.315	0.220	0.217	0.591	86°
	PTKA0408F	M4 X 0.5	0.327	0.224	0.256	0.591	91°
	PTKA0409F	M4 X 0.5	0.366	0.264	0.256	0.591	91°
	PTKA0410F	M4 X 0.5	0.406	0.303	0.256	0.591	91°
	PTKA0411F	M4 X 0.5	0.445	0.343	0.256	0.591	91°
	PTKA0412	M4 X 0.7	0.472	0.295	0.232	0.591	92°
	PTKA0412F	M4 X 0.5	0.484	0.382	0.256	0.591	91°
	PTKA0413F	M4 X 0.5	0.524	0.421	0.256	0.591	91°
	PTKA0512	M5 X 0.8	0.472	0.276	0.272	0.787	92°
	PTMA03508	M3.5 X 0.6	0.315	0.209	0.236	0.354	90°
	PTMA0403F	M4 X 0.5	0.130	0.067	0.256	0.591	91°
	PTMA0404F	M4 X 0.5	0.169	0.106	0.256	0.591	91°
	PTMA0405F	M4 X 0.5	0.209	0.146	0.256	0.591	91°
	PTMA0406F	M4 X 0.5	0.248	0.185	0.256	0.591	91°
	PTMA0411	M4 X 0.7	0.433	0.335	0.260	0.591	90°
	PTKA0411-R3	M4 X 0.7	0.433	0.272	0.236	0.591	

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	PXMA0306	M3 X 0.5	0.232		0.224	0.079	90°
	SHX0310	M3 X 0.5	0.394		0.232	0.079	91°
	RHA0510	M5 X 0.8		0.394		0.157	
	RHA0613	M6 X 1.0	0.642	0.512	0.413	0.157	
	RHA0620	M6 X 1.0	0.945	0.787	0.413	0.157	
	FHGA0618	M6 X 1.0	0.709		0.335	0.157	61°
	VHX0509B	M5 X 0.8	0.354	0.163	0.197	0.079	
	VHX0512B	M5 X 0.8	0.472	0.256	0.197	0.079	
	VHX0512BN	M5 X 0.8	0.472	0.258	0.197	0.079	
	VHX0514	M5 X 0.8	0.571	0.325	0.197	0.079	
	VHX0613N	M6 X 1.0	0.528	0.295	0.233	0.098	
	VHX0617	M6 X 1.0	0.669	0.394	0.236	0.098	
	VHX0617N	M6 X 1.0	0.659	0.328	0.232	0.098	
	VHX0817N	M8 X 1.0	0.671	0.314	0.311	0.118	
	VHX0820N	M8 X 1.0	0.815	0.314	0.311	0.118	
	VHX0820AN	M8 X 1.0	0.807	0.408	0.311	0.118	
	VHX0821	M8 X 1.0	0.827	0.394	0.315	0.118	
	VHX0821N	M8 X 1.0	0.835	0.381	0.311	0.118	
	VHX0823N	M8 X 1.0	0.925	0.408	0.311	0.118	
	VHX0825	M8 X 1.0	0.984	0.472	0.315	0.118	
	VHX1027N	M10 X 1.0	1.071	0.567	0.386	0.197	
	VHX1236N	M12 X 1.0	1.417	0.720	0.465	0.197	
	VHX0613A	M6 X 1.0	0.528	0.358	0.236	0.098	
	SHXN0509F	M5 X 0.5	M3.5x0.6	0.341	0.248	0.138	
	SHXN0610F	M6 X0.75	M4x0.5	0.394	0.307	0.157	
	SHXN0712F	M7 X0.75	M5x0.8	0.472	0.335	0.197	
	WTX0813	M8 X 1.25	0.677	0.193	0.335	0.984	
	WTX0817	M8 X 1.25	0.866	0.193	0.335	0.984	

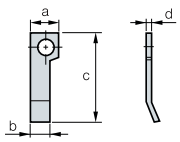
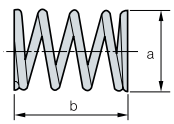
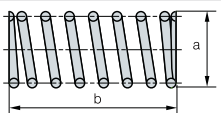
Shim Pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3	0.217	0.138	0.232	
	SP3N	0.270	0.130	0.219	
	SP3N-1	0.209	0.130	0.219	
	SP4	0.276	0.157	0.299	
	SP4N	0.228	0.171	0.291	
	SP5	0.335	0.177	0.346	
	SP5N	0.335	0.224	0.354	
	SP6N	0.437	0.236	0.433	
	SP8N	0.472	0.394	0.604	
	SP2M	0.197	0.551	M5x0.8	0.236
	SP3M	0.138	0.768	M4x0.7	0.157
	SP3M-1	0.138	0.650	M4x0.7	0.157
	SP4M	0.197	0.748	M5x0.8	0.236

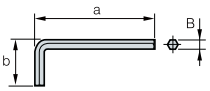
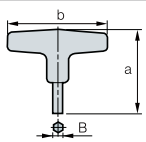
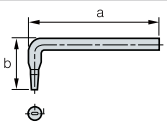
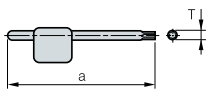
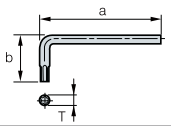
Shim Pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3D	0.146	0.516	UNF10-32	0.220
	SP3D2	0.142	0.472	UNF10-32	0.217
	SP3DS	0.146	0.454	UNF10-32	0.220
	SP4D	0.196	0.677	UNF1/4 28	0.280
	SP4DL	0.197	0.673	UNF1/4 28	0.276
	SP4DS	0.196	0.522	UNF1/4 28	0.000
	SP5D	0.244	0.862	UNF5/16-24	0.372
	SP6D	0.305	0.862	UNF3/8-24	0.434
	SP8D	0.355	1.167	UNF7/16-20	0.559
	LSPS3	2.362	0.323	0.219	
	LSPS4	2.559	0.394	0.276	
	LSPS5	2.717	0.449	0.348	
	LSPS6	2.717	0.512	0.433	
	LSPS8	2.874	0.650	0.598	

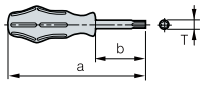
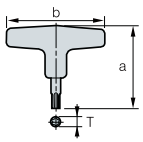
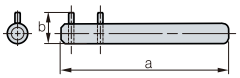
Spring

Geometry	Designation	Dimensions			
		a	b	c	d
	SR2	0.157	0.110	0.496	0.016
	SPR0315	0.118	0.591		
	SPR0415	0.157	0.591		
	SR3	0.362	0.492		
	SR4	0.157	0.433		
	SPR0714	0.276	0.551		
	SPR0510	0.197	0.394		
	SPR0714	0.276	0.551		
	SPR0811	0.315	0.433		

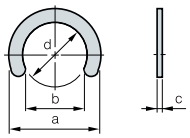
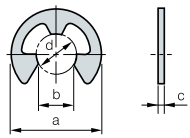
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	HW20L	2.047	0.709	0.079
	HW25L	2.303	0.807	0.098
	HW30L	2.598	0.906	0.118
	HW35L	2.835	0.984	0.138
	HW40L	2.913	1.142	0.157
	HW50L	3.346	1.299	0.197
	HW40	3.228	3.150	0.157
	HW50	3.780	3.543	0.197
	SW50L	2.756	1.083	
	TW06P	2.480		0.236
	TW07P	2.480		0.276
	TW08P	2.795		0.315
	TW09P	2.953		0.354
	TW10P	3.071		0.394
	TW15P	3.228		0.591
	TW20P	3.386		0.787
	TW15L	2.362	0.827	0.591
	TW20L	2.362	0.827	0.787

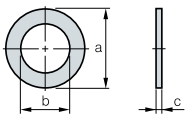
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	TW07S	5.512	2.362	0.276
	TW08S	5.906	2.992	0.315
	TW09S	6.496	2.756	0.354
	TW15S	7.480	3.543	0.591
	TW20S	7.677	3.583	0.787
	TW20	2.953	3.150	0.787
	TW25	2.913	3.150	0.984
	SW15S	5.906	0.512	

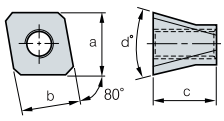
Stop Ring

Geometry	Designation	Dimensions			
		a	b	c	d
	CR03	0.189	0.102	0.016	0.118
	CR04	0.260	0.142	0.016	0.157
	CR05	0.299	0.181	0.016	0.197
	ER03	0.276	0.102	0.024	0.118
	ER04	0.354	0.138	0.024	0.157
	ER05	0.039	0.169	0.024	0.197

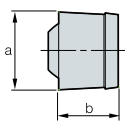
Washer

Geometry	Designation	Dimensions		
		a	b	c
	WA3	0.133	0.268	0.02~0.039
	WA4	0.394	0.209	0.02~0.039

Stopper

Geometry	Designation	Dimensions			
		a	b	c	d°
	STP5	0.433	0.402	0.433	30°

Nozzle

Geometry	Designation	Dimensions			
		a	b	c	d°
	CN0605	0.433	0.402	0.433	30°

TECHNICAL INFORMATION

General Information I

Technical Information

General Information II

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TECHNICAL INFORMATION

Carbon steel and alloy steel for structural use

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Carbon steel		1010	SM10C	C10	S10C	040A10 045A10 045M10	C10E C10R	XC10	-
		1015	SM15C	C15E4 C15M2	S15C	055M15	C15E C15R	-	-
		1020	SM20C	-	S20C	070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
		1025	SM25C	C25 C25E4 C25M2	S25C	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
		1030	SM30C	C30 C30E4 C30M2	S30C	080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
		1035	SM35C	C35 C35E4 C35M2	S35C	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
		1039 1040	SM40C	C40 C40E4 C40M2	S40C	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
		1042 1043	SM43C	-	S43C	080A42	-	-	40Г
		1045 1046	SM45C	C45 C45E4 C45M2	S45C	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
		-	SM48C	-	S48C	080A47	-	-	45Г
		1049	SM50C	C50 C50E4 C50M2	S50C	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
		1050 1053	SM53C	-	S53C	-	-	-	50Г
		1055	SM55C	C55 C55E4 C55M2	S55C	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
		1059 1060	SM58C	C60 C60E4 C60M2	S58C	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
Alloy steel	Nickel chromium steel	- - - - -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 15NiCr13 -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 655M13(655H13) -	- - - 15NiCr13 -	- - - - -	40XH - 30XH3A - -
	Nickel chromium molybdenum steel	8615 8617(H) 8620(H) 8622(H)	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		8637 8640	SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	-	-	-	-
		- 4320(H) - 4340 - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	-	SCr415(H)	-	SCr415(H)	-	17Cr3 17CrS3	-	15X 15XA
		5120(H)	SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	-	-	-	20X
		5130(H) 5132(H)	SCr430(H)	34Cr4 34CrS4	SCr430(H)	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		5135(H)	SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		5140(H)	SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
			SCr445(H)		SCr445(H)				45X

• The above Alloy steel can supplied by domestic manufacturing

Carbon steel and alloy steel for structural use

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Alloy steel	Chromium molybdenum steel	-	SCM415(H)	-	SCM415(H)	-	-	-	-
		-	SCM418(H)	18CrMo4 18CrMoS4	SCM418(H)	-	18CrMo4 18CrMoS4	-	20XM
		-	SCM420(H)	-	SCM420(H)	708M20(708H20)	-	-	20XM
		4130	SCM430	-	SCM430	-	-	-	30XM 30XMA
		-	SCM432	-	SCM432	-		-	-
		(4135H) 4137(H)	SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		4140(H) 4142(H)	SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		4145(H) 4147(H)	SCM445(H)	-	SCM445(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	1522(H) 1534 1541(H) 1541(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	22Mn6(H) - 36Mn6(H) 42Mn6(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	150M19 150M36 150M36 - - -	- - - - -	- - - - -	- 30Г2 35Г2 35Г2 40Г2 40Г2 45Г2 - -
	Aluminum chromium molybdenum steel	-	SACM645	41CrAlMo74	SACM645	-	-	-	-

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
High speed steel	T1 T4 T5 T15 M2 M3-1 M3-2 M4 M 35 M36 - M7 M42	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	HS18-0-1 - - - HS6-5-2 HS6-6-2 HS6-5-3 HS6-5-4 HS6-5-2-5 - HS10-4-3-10 HS2-9-2 HS2-9-1-8	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	BM 2 BM 35	S6/5/2 S6/5/2/5 S2/9/2	Z 85 WDCV 6-5-2-5	
Alloy tool steel	F2 - - - L6 - - - - W2-9 1/ W2-8 1-2 - - - - - D3 D2 A2 - H21 H11 H13 H12 H10 H19 - L6	STS11 STS2 STS21 STS5 STS51 STS7 STS8 STS4 STS41 STS43 STS44 STS3 STS31 STS93 STS94 STS95 STD1 STD11 STD12 STD4 STD5 STD6 STD61 STD62 STD7 STD8 STF3 STF4	- - - - - - - - - 105V - - 105WCr1 - - - 210Cr12 - 100CrMoV5 - X30WCrV9-3 X37CrMoV5-1 X40CrMoV5-1 X35CrWMoV5 32CrMoV12-28 - - 55NiCrMoV7	SKS11 SKS2 SKS21 SKS5 SKS51 SKS7 SKS8 SKS4 SKS41 SKS43 SKS44 SKS3 SKS31 SKS93 SKS94 SKS95 SKD1 SKD11 SKD12 SKD4 SKD5 SKD6 SKD61 SKD62 SKD7 SKD8 SKT3 SKT4	BD3 BA2 BH21 BH13	105WCr6 X210Cr12 X100CrMoV5 1 X30WCrV9 3 X40CrMoV5 1 55NiCrMoV6	105WC13 Z200C12 Z100CDV5 Z30WCV9 Z40CDV5 55NCDV7	

• The above Alloy steel can supplied by domestic manufacturing

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Free cutting carbon steel	1110	SUM11	-	SUM11				
	1109	SUM12	-	SUM12				
	1212	SUM21	9S20	SUM21				
	1213	SUM22	11SMn28	SUM22	230M07	9SMn28	S250	
	12L13	SUM22L	11SMnPb28	SUM22L		9SMnPb28	S250Pb	
	1215	SUM23	-	SUM23	240M07	9SMn36	S 300	
	-	SUM23L	-	SUM23L				
	12L14	SUM24L	11SMnPb28	SUM24L		9SMnPb36	S300Pb	
	-	SUM25	12SMn35	SUM25				
	1117	SUM31	-	SUM31				
	-	SUM31L	-	SUM31L				
	-	SUM32	-	SUM32				
	1137	SUM41	-	SUM41				
	1141	SUM42	-	SUM42				
	1144	SUM43	44SMn28	SUM43				
High carbon chromiom	-	STB1	-	SUJ1				
	52100	STB2	B1	SUJ2	534A99	100Cr6	100Cr6	
	ASTM A 485 Grade 1	STB3	B2	SUJ3				
	-	STB4	-	SUJ4				
	-	STB5	-	SUJ5				

• The above Special speed steel can supplied by domestic manufacturing

Stainless steel

Type		U.S.A		Korea	ISO	Japan	Great Britain	Germany	France	Russia
		UNS	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Stainless steel	Austenitic	S20100	201	STS201	X12CrMnNiN17-7-5	SUS201	284S16	X12CrNi17-7	Z12CMN17-07Az	12Х17•9АН4
		S20200	202	STS202	X12CrMnNiN18-9-5	SUS202	301S21	X2CrNiN18-7		07X16H6
		S30100	301	STS301	X10CrNi18-8	SUS301		X12CrNi17-7	Z11CN17-08	
				STS301L	X2CrNiN18-7	SUS301L				
				STS301J1		SUS301J1	302S25			12X18H9
		S30200	302	STS302		SUS302		X10CrNiS18-9	Z12CN18-09	
		S30215	302B	STS302B	X12CrNiSi18-9-3	SUS302B	303S21			
		S30300	303	STS303	X10CrNiS18-9	SUS303	303S41		Z8CNF18-09	12X18H10E
		S30323	303Se	STS303Se		SUS303Se		X5CrNi18-10		
				STS303Cu		SUS303Cu	304S31			08X18H10
		S30400	304	STS304	X5CrNi18-9 X2CrNi18-9	SUS304	304S11	X2CrNi19-11	Z7CN18-09	03X18H11
		S30403	304L	STS304L	X2CrNi19-11	SUS304L		X2CrNiN18-10	Z3CN19-11	
		S30451	304N	STS304N1	X5CrNiN18-8	SUS304N1			Z6CN19-09Az	
		S30453	304LN	STS304LN	X2CrNiN18-8	SUS304LN		X5CrNi18-12	Z3CN18-10Az	
				STS304J1		SUS304J1	305S19			06X18H11
		S30500	305	STS305	X6CrNi18-12	SUS305			Z8CN18-12	
		S30908	309S	STS309S		SUS309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10X23H18
		S31008	310S	STS310S	X6CrNi25-20	SUS310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		S31600	316	STS316	X5CrNiMo17-12-2 X3CrNiMo17-12-3	SUS316	316S11	X2CrNiMo17-13-2 X2CrNiMo17-14-3	Z7CND17-12-02 Z6CND18-12-03	03X17H14M3
		S31603	316L	STS316L	X2CrNiMo17-12-2 X2CrNiMo17-12-3 X2CrNiMo18-14-3	SUS316L			Z3CND17-12-02 Z3CND17-12-03	
		S31651	316N	STS316N		SUS316N	317S16	X6CrNiTi18-10		
		S31700	317	STS317		SUS317	321S31	X6CrNiNb18-10		08X18H10T
		S32100	321	STS321	X6CrNiTi18-10	SUS321	347S31		Z6CNT18-10	08X18H12
		S34700	347	STS347	X6CrNiNb18-10	SUS347		X6CrAl13	Z6CNNb18-10	
		S38400	384	STS384	X3NiCr18-16	SUS384	405S17		Z6CN18-16	
	Ferritic	S40500	405	STS405	X6CrAl13	SUS405			Z8CA12	
				STS410L		SUS410L		X6Cr17	Z3C14	
		S42900	429	STS429		SUS429	430S17	X7CrS18		12X17
		S43000	430	STS430	X6Cr17	SUS430		X6CrMo17-1	Z8C17	
		S43020	430F	STS430F	X7CrS17	SUS430F	434S17		Z8CF17	
		S43400	434	STS434	X6CrMo17-1	SUS434			Z8CD17-01	
		S44400	444	STS444	X2CrMoTi18-2	SUS444			Z3CDT18-02	
		S44627		STSXM27		SUSXM27		X10Cr13	Z1CD26-01	
	Martensitic	S40300	403	STS403		SUS403	410S21			
		S41000	410	STS410	X12Cr13	SUS410	416S21	X20Cr13	Z13C13	
		S41600	416	STS416	X12CrS13	SUS416	420S29	X20CrNi17-2	Z11CF13	20X13
		S42000	420	STS420J1	X20Cr13	SUS420J1	431S29		Z20C13	20X17H2
		S43100	431	STS431	X19CrNi16-2	SUS431			Z15CN16-02	
		S44002	440A	STS440A	X70CrMo15	SUS440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	S17400	S17400	STS630	X5CrNiCuNb16-4	SUS630			Z6CNU17-04	09Х17Н7ІО
		S17700	S17700	STS631	X7CrNiAl17-7	SUS631			Z9CNA17-07	
				STS631J1		SUS631J1				

• The above Stainless steel can supplied by domestic manufacturing

Casting or forging steel

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Casting Iron	Grey iron casting	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	 Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400	GG 10 GG 15 GG 20 GG 25 GG 30 GG 35 GG 40	Ft 10 D Ft 15 D Ft 20 D Ft 25 D Ft 30 D Ft 35 D Ft 40 D	-
	Spheroidal graphite iron casting	60-40-18 80-55-06 100-70-03	GCD400 GCD500 GCD600 GCD700	700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22	FCD400 FCD500 FCD600 FCD700	SNG 420/12 SNG 370/17 SNG 500/7 SNG 600/3 SNG 700/2	GGG 40 GGG 40.3 GGG 50 GGG 60 GGG 70	FCS 400-12 FGS 370-17 FGS 500-7 FGS 600-3 FGS 700-2	B
	Austempered Spheroidal graphite iron casting	-	FCAD	-	FCAD	EN-GJS-	EN-GJS-	EN-GJS-	-
	Austenitic iron casting	Type 1, 2, Type D-2, D-3A Class 1, 2	FCA- FCDA-	L-, S-	FCA- FCDA-	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	-

Non-ferrous alloy

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Aluminum alloy	Aluminum alloy ingots for casting	204.0 - 319.0 - - - 356.0 A356.0 355.0 242.0 514.0 - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	Al-Cu4MgTi - - - - - Al-Si7Mg(Fe) Al-Si7Mg Al-Si5Cu1Mg Al-Cu4Ni2Mg2 - - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	- - - LM-6 - - LM-25 - LM-16 - LM-5 LM-13 LM-26 - LM-29 -	- - - - G(GK)-AlSi9Cu3 - G(GK)-AlSi7MG - - G(GK)-AlMg5 - - - - - GD-AlSi12 (Cu)	A-U5GT - - - - - A-S7G - - A-U4NT - A-S12UNG A-S10UG A-S10UG - A-S18UNG	
	Aluminum alloy die casting	A413.0 A360.0 518.0 - A380.0 A380.0 383.0 383.0 B390.0	ALDC1 ALDC2 ALDC3 ALDC4 ALDC7 ALDC7Z ALDC8 ALDC8Z ALDC9	Al-Si12CuFe - - - Al-Si8Cu3Fe Al-Si8Cu3Fe - - -	ADC1 ADC3 ADC5 ADC6 ADC10 ADC10Z ADC12 ADC12Z ADC14	LM20 - - - - LM24 LM2 LM2 LM30	GD-AlSi10Mg GD-AlMg9 - GD-AlSi9Cu3 GD-AlSi9Cu3 - - - EN AW-5052	A-S13 A-S9G A-G6 A-G3T - - - - -	
	Aluminum alloy extruded shapes	5052 5454 5083 5086 6061 6063 - - 7075	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	- - AlMg4.5Mn0.7 - AlMg1SiCu AlMg0.7Si - - AlZn5.5MgCu	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075 -	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	

Heat resistant steel

Type		U.S.A		Korea	ISO	Japan	Great Britain	Germany	France	Russia
		UNS	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Heat resistant steel	Austenitic	 S63008 S63017 S30900 S31000 N08330 S66286	 309 310 N08330	STR31 STR35 STR36 STR37 STR38 STR309 STR310 STR330 STR660 STR661		SUH31 SUH35 SUH36 SUH37 SUH38 SUH309 SUH310 SUH330 SUH660 SUH661	331S42 349S52 349S54 381S34 309S24 310S24	 X53CrMnNi21-9 CrNi2520 CrAl1205	Z35CNWS14-14 Z52CMN21-09-Az Z55CMN21-09-Az Z15CN24-13 Z15CN25-20 Z12NCS35-16 Z6NCTV25-20	
	Ferritic	R30155 S40900	 409	STR21 STR409 STR409L STR446	X6CrTi12 X2CrTi12	SUH21 SUH409 SUH409L SUH446	409S19	X6CrTi12 X45CrSi9-3	Z6CT12 Z3CT12 Z12C25	
	Martensitic	S44600 S65007 S42200	 446 	STR1 STR3 STR4 STR11 STR600 STR616		SUH1 SUH3 SUH4 SUH11 SUH600 SUH616	401S45 443S65		Z45CS9 Z40CSD10 Z80CSN20-02	

• The above Heat resistant steel can supplied by domestic manufacturing

Steel, Non-ferrous metal symbol list

Comparison of workpiece material standards

GROUP		STANDARD TERM	CODE
Structural Steel		Rolled Steel for Welded Suructure	SWS
		Rerolled Steel	SBR
		Rolled Steel for General Structure	SB
		Light Gauge Steel for General Structure	SBC
		Hot- rolled Steel Plate, Sheet/ Strip for Automobile Structural Use	SAPH
Steel Plate		Cold-rolled Steel Sheet/Strip	SBC
		Hot-rolled Soft Steel Sheet/Strip	SHP
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SPP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STH
		Seamless Steel Pipe for High Pressure Gas Cylinder	STHG
		Carbon Steel Pipe for General Structural Use	SPS
		Carbon Steel Pipe for Machine Structural Use	STST
		Alloy Steel Pipe for Structural Use	STA
		Stainless Steel Pipe for Machine and Structural Use	STS-TK
		Carbon Steel Square Pipe for General Structural Use	SPSR
		Alloy Steel Pipe	SPA
		Carbon Steel Pipe for Pressure Service	SPPS
		Carbon Steel Pipe for High Temperature Service	SPSR
		Carbon Steel Pipe for High Pressure Service	SPPH
		Stainless Steel Pipe	STSxT
Iron and Steel		Carbon Steel for Machine Structural Use	SMxxC, SMxxCK
		Aluminum Chromium Molybdenum Steel	SACM
		Chromium Molybdenum Steel	SCM
		Chromium Steel	SCr
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn, SMnC
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	SKC
		Alloy Tool Steel	STS, STD, STF
		High Speed Tool Steel	SKH
	Stainless steel	Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR
		Free cutting carbon steel	SUM
		Special steel	STB
		Spring steel	SPS

GROUP	STANDARD TERM	CODE
Forged steel	Carbon Steel Forging	SF
	Chromium Molybdenum Steel Forging	SFCM
	Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast iron	Gray Cast iron	GC
	Spheroidal Graphite Cast iron	GCD
	Blackheart Malleable Cast iron	BMC
	Whiteheat Malleable Cast iron	WMC
	Pearlitic Malleable Cast iron	PMC
Cast steel	Carbon Cast Steel	SC
	High Tensile Strength Carbon Cast Steel&Low Alloy Cast Steel	HSC
	Stainless Cast Steel	SSC
	Heat Resisting Cast Steel	HRSC
	High Manganese Cast Steel	HMnSC
	Cast Steel for High Temperature and High Pressure Service	SCPH
Casting	Brass Casting	BsC
	High Strength Brass Casting	HBsC
	Bronze Casting	BrC
	Phosphoric Bronze Casting	PCB
	Aluminum Bronze Casting	AlBC
	Aluminum Alloy Casting	ACxA
	Magnesium Alloy Casting	MgC
	Zinc Alloy Die Casting	ZnDC
	Aluminum Alloy Die Casting	AlDC
	Magnesium Alloy Die Casting	MgDC
	White Metal	WM
	Aluminum Alloy Casting for Bearing	AM
	Brass Alloy Casting for Bearing	KM

SI unit conversion table

Major SI unit conversion table

Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^{-5}
9.80665	1	9.80665×10^{5}
1×10^{-5}	1.01972×10^{-6}	1

Stress

Pa or N/m^2	MPa or N/mm^2	kgf/mm^2	kgf/cm^2	kgf/m^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

Pressure

Pa	kPa	MPa	bar	kgf/cm^2
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^{6}	1×10^{3}	1	1×10	1.01972×10
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1

Work, Energy, Calorie

J	kW · h	kgf · m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

Power

W	kW	kgf · m/s	PS	kcal/h
1	1×10^{-3}	1.01972×10^{-1}	1.35962×10^{-3}	8.60000×10^{-1}
1×10^{3}	1	1.01972×10^{2}	1.359 62	8.60000×10^{2}
9.81 65	9.80665×10^{-3}	1	1.33333×10^{-2}	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	6.32529×10^{2}
1.16279	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-3}	1

Specific heat

J/(kg·K)	kcal/(kg·℃) cal/(g·℃)
1	2.38889×10^{-4}
4.18605×10^{3}	1

Thermal conductivity

W/(m·k)	kcal/(h·m·℃)
1	8.6000×10^{-1}
1.16279	1

Revolution per minute

min^{-1}	s^{-1}	r.p.m.
1	0.0167	1
60	1	60

Hardness calculating table

Work piece hardness calculating table

Vickers 50kgf Hv	Brinell 3000kgf HB		Rockwell				Shore	Tensile strength (approximate value)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD	HS	MPa(1)
940	-	-	85.6	-	68.0	76.9	97	
920	-	-	85.3	-	67.5	76.5	96	
900	-	-	85.0	-	67.0	76.1	95	
880	-	(767)	84.7	-	66.4	75.7	93	
860	-	(757)	84.4	-	65.9	75.3	92	
840	-	(745)	84.1	-	65.3	74.8	91	
820	-	(733)	83.8	-	64.7	74.3	90	
800	-	(722)	83.4	-	64.0	74.8	88	
780	-	(710)	83.0	-	63.3	73.3	87	
760	-	(698)	82.6	-	62.5	72.6	86	
740	-	(684)	82.2	-	61.8	72.1	84	
720	-	(670)	81.8	-	61.0	71.5	83	
700	-	(656)	81.3	-	60.1	70.8	81	
690	-	(647)	81.1	-	59.7	70.5	-	
680	-	(638)	80.8	-	59.2	70.1	80	
670	-	630	80.6	-	58.8	69.8	-	
660	-	620	80.3	-	58.3	69.4	79	
650	-	611	80.0	-	57.8	69.0	-	
640	-	601	79.8	-	57.3	68.7	77	
630	-	591	79.5	-	56.8	68.3	-	
620	-	582	79.2	-	56.3	67.9	75	
610	-	573	78.9	-	55.7	67.5	-	
600	-	564	78.6	-	55.2	67.0	74	
590	-	554	78.4	-	54.7	66.7	-	2055
580	-	545	78.0	-	54.1	66.2	72	2020
570	-	535	77.8	-	53.6	65.8	-	1985
560	-	525	77.4	-	53.0	65.4	71	1950
550	(505)	517	77.0	-	52.3	64.8	-	1905
540	(496)	507	76.7	-	51.7	64.4	69	1860
530	(488)	497	76.4	-	51.1	63.9	-	1825
520	(480)	488	76.1	-	50.5	63.5	67	1795
510	(473)	479	75.7	-	49.8	62.9	-	1750
500	(465)	471	75.3	-	49.1	62.2	66	1705
490	(456)	460	74.9	-	48.4	61.6	-	1660
480	488	452	74.5	-	47.7	61.3	64	1620
470	441	442	74.1	-	46.9	60.7	-	1570
460	433	433	73.6	-	46.1	60.1	62	1530
450	425	425	73.3	-	45.3	59.4	-	1495
440	415	415	72.8	-	44.5	58.8	59	1460
430	405	405	72.3	-	43.6	58.2	-	1410
420	397	397	71.8	-	42.7	57.5	57	1370
410	388	388	71.4	-	41.8	56.8	-	1330
100	379	379	70.8	-	40.8	56.0	55	1290
390	369	369	70.3	-	39.8	55.2	-	1240
380	360	360	69.8	(100.0)	38.8	54.4	52	1205
370	350	350	69.2	-	39.9	53.6	-	1170
360	341	341	68.7	(109.0)	36.6	52.8	50	1130
350	331	331	68.1	-	35.5	51.9	-	1095
340	322	322	67.6	(108.0)	34.4	51.1	47	1070
330	313	313	67.0	-	33.3	50.2	-	1035
320	303	303	66.4	(107.0)	32.2	49.4	45	1005
310	294	294	65.8	-	31.0	48.4	-	980
300	284	284	65.2	(105.5)	29.8	47.5	42	950
295	280	280	64.8	-	29.2	47.1	-	935
290	275	275	64.5	(104.5)	28.5	46.5	41	915
285	270	270	64.2	-	27.8	46.0	-	905
280	265	265	63.8	(103.5)	27.1	45.3	40	890
275	261	261	63.5	-	26.4	44.9	-	875
270	256	256	63.1	(102.0)	25.6	44.3	38	855
265	252	252	62.7	-	24.8	43.7	-	840
260	247	247	62.4	(101.0)	24.0	43.1	37	825
255	243	243	62.0	-	23.1	42.2	-	805
250	238	238	61.6	99.5	22.2	41.7	36	795
245	233	233	61.2	-	21.3	41.1	-	780
240	228	228	60.7	98.1	20.3	40.3	34	765
230	219	219	-	96.7	(18.0)	-	33	730
220	209	209	-	95.0	(15.7)	-	32	695
210	200	200	-	93.4	(13.4)	-	30	670
200	190	190	-	91.5	(11.0)	-	29	635
190	181	181	-	89.5	(8.5)	-	28	605
180	171	171	-	87.1	(6.0)	-	26	580
170	162	162	-	85.0	(3.0)	-	25	545
160	152	152	-	81.7	(0.0)	-	24	515
150	143	143	-	78.7	-	-	22	490
140	133	133	-	75.0	-	-	21	455
130	124	124	-	71.2	-	-	20	425
120	114	114	-	66.7	-	-	-	390
110	105	105	-	62.3	-	-	-	-
100	95	95	-	56.2	-	-	-	-
95	90	90	-	52.0	-	-	-	-
90	86	86	-	48.0	-	-	-	-
85	81	81	-	41.0	-	-	-	-

Note) 1. 1MPa=1N/mm²
2. The number In the blank is not generally used ranges.

Properties of Korloy grades

Physical properties of Korloy grades

Application	ISO Classification symbol		Korloy grades	Specific gravity (g/㎤)	Hardness (HRA)	TRS (kgf/㎟)	Compressive strength (kg/㎟)	Young's modulus (10^3kgf/㎟)	Thermal expansion coefficient (10^{-6}/°C)	Thermal conductivity (cal/㎝sec°C)
Grades for cutting tools	P	P01	ST05	10.6	92.7	140	440	-	-	-
		P10	ST10	10.0	92.1	175	460	48	6.2	25
		P20	ST20	11.8	91.9	200	480	56	5.2	42
		P30	ST30A	12.2	91.3	230	500	53	5.2	-
	M	M10	U10	12.9	92.4	170	500	47	-	-
		M20	U20	13.1	91.1	210	500	-	-	88
		M30	ST30A	12.2	91.3	230	500	53	5.2	-
		M40	U40	13.3	89.2	270	440	-	-	-
	K	K01	H02	14.8	93.2	185	-	61	4.4	105
		K10	H01	13.0	92.9	210	570	66	4.7	109
		K20	G10	14.7	90.9	250	500	63	-	105
Ultra fine grain alloy	Z	Z10	FA1	14.1	91.4	290	-	58	5.7	-
		Z20	FCC	12.5	91.3	235	-	-	-	-
Grade for tungsten carbide wear parts	V	V1	D1	15.0	92.3	205	520	-	-	-
		V2	D2	14.8	90.9	250	150	-	-	-
		V3	D3	14.6	89.7	310	410	-	-	-
		V4	G5	14.3	89.0	320	380	-	-	-
		V5	G6	14.0	87.7	350	330	-	-	-
Grade for mining and civil engineering tools	E	E1	GR10	14.8	90.9	220	-	-	-	-
		E2	GR20	14.8	90.3	240	-	-	-	-
		E3	GR30	14.8	89.0	270	-	-	-	-
		E4	GR35	14.8	88.2	270	-	-	-	-
		E5	GR50	14.5	87.0	300	-	-	-	-

The physical properties of element

Element	Specific gravity (g/㎤)	Hardness (Hv)	Young's modulus ($\times10^3$kgf/mm²)	Thermal conductivity (cal/㎝ · sec · ℃)	Thermal expansion coefficient ($\times10^{-6}$/℃)	Melting point (℃)
WC	15.60	2,150	70	0.30	5.1	5,252
TiC	4.94	3,200	45	0.04	7.6	5,792
TaC	14.50	1,800	29	0.05	6.6	6,872
NbC	8.20	2,050	35	0.04	6.8	6,332
TiN	5.43	2,000	26	0.07	9.2	5,342
Al203	3.98	3,000	42	0.07	8.5	3,722
cBN	3.48	4,500	71	3.10	4.7	-
Diamond	3.52	9,000	99	5.00	3.1	-
Co	8.90	-	10~18	0.165	12.3	2,723
Ni	8.90	-	20	0.22	13.3	2,651

Technical information for Stainless steel

Guide of stainless-steel machining

▶ Stainless steels well known for their excellent anti-corrosive property.

▶ Excellent anti-corrosive property is due to the Chromium added to these alloys. In general, stainless have 4%~10% Chromium content.

● Classifications & Features of Stainless steel.

1) Austenite series : One of the most general kinds of stainless steels, it has some of the best corrosion-resistance properties due to a high Chromium & Nickel content. A high Nickel content also makes machining more difficult. Austenite series stainless steels are usually used for can processing, chemical products and construction purposes. (AISI 303, 304, 316)

2) Ferrite series : It has Chromium content similar to Austenite series, but none of the Nickel content which results in freer machining. (AISI 410, 430, 434)

3) Martensite series : The only stainless steel with the ability to be heat treated. It has a high carbon content but poor corrosion resistance, so it is used for parts that need higher hardness. (AISI 410, 420, 432)

4) Precipitate hardened series : A Chromium-Nickel alloy, it has improved hardness through low temperature heat-treatment and has superior corrosion resistance and toughness at the same time. (AISI 17, 15)

5) Austenite-Ferrite series : Though it has similar properties with Austenite and Ferrite, it has much more superior heat-resistance (approx. 2 times better). Usually used where thermal-corrosion stability is needed, such as condensers (AISI S2304, 2507).

● Difficult-to-Cut Factors of Stainless steel.

1) Work-hardening property - Causes premature wear of tool and poor control chip.

2) Low thermal conductivity - Causes plastic deformation of cutting edge and fast wear of tools.

3) Built-up-edge - More susceptible to micro-chipping on cutting edges and causes bad surface-finish.

4) Chemical affinity between tool and workpiece caused by work-hardening and low thermal-conductivity of workpiece, this might generate abnormal-wear, chipping and/or abnormal fracture.

● Tips for Machining of Stainless steel.

1) Use a tool that has higher thermal-conductivity
Low thermal-conductivity of stainless steels accelerates tool wear resulting from a decline in hardness of the cutting edge of an insert, this is due to heat piling up. It is better to use a tool that has higher thermal conductivity and with enough coolant.

2) Sharper cutting edge-line
It is necessary to utilize larger rake-angles and wider chip-breaker lands to reduce cutting-load pressure and prevent build-up-edge. This will help provide better chip control.

3) Optimal cutting condition
Inappropriate machining conditions like extremely low or high-speeds or low feed rates can cause poor tool life due to work-hardening of work piece.

4) Choose an appropriate tool
Tools for stainless steels should have good toughness attributes, enough strength on their edge-line (cutting edge) & a higher film adhesion.

Chip Breakers for Stainless steel machining

HA / Finishing

- Sharp edge for shallow depth cutting
- Increase tool life through reduced chip control friction at high speed cutting
- Good surface finish of work piece

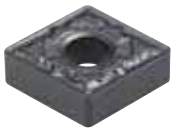
HS / Medium cutting

- Enhanced cutting efficiency and increase tool life due to enhanced chip flow.
- Reinforced wear resistance through adopting a high land rake angle.
- Special land design to prevent notching and enhance toughness

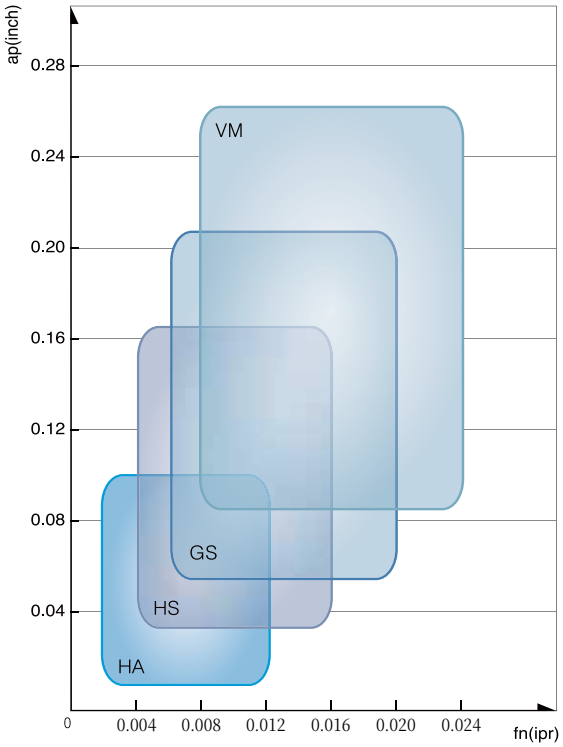
GS / Medium to Rough cutting

- Superior tool life at light intermittent cutting
- Better chip flow through wide chip pocket
- Prevent build-up-edge by low cutting force design

VM / Roughing



- Chip breaker for intermittent cutting
- Unique chip breaker design provide smooth chip control.
- Strong edge line permit superior toughness

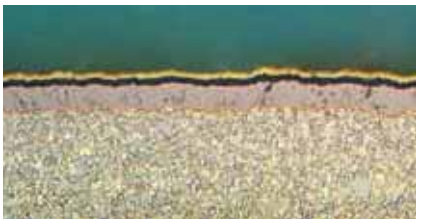


Grades for Stainless steel machining

▶ KORLOY New Grades for Stainless steel machinig

● NC9020, For high speed turning of Stainless steel.

- ▶ Specially designed substrate & film suitable for high-speed machining of stainless steels.
- ▶ Superior cutting performance under conditions in moderate-speed applications for cutting low-carbon steels and low-carbon alloy steel
- ▶ Longer tool-life can be achieved thanks to a superior chipping-resistance design in the grade.
- ▶ Obtain better cutting performance. Korloy offers a variety of combinations of chip breakers to machine easily even in deeper depth of cut.



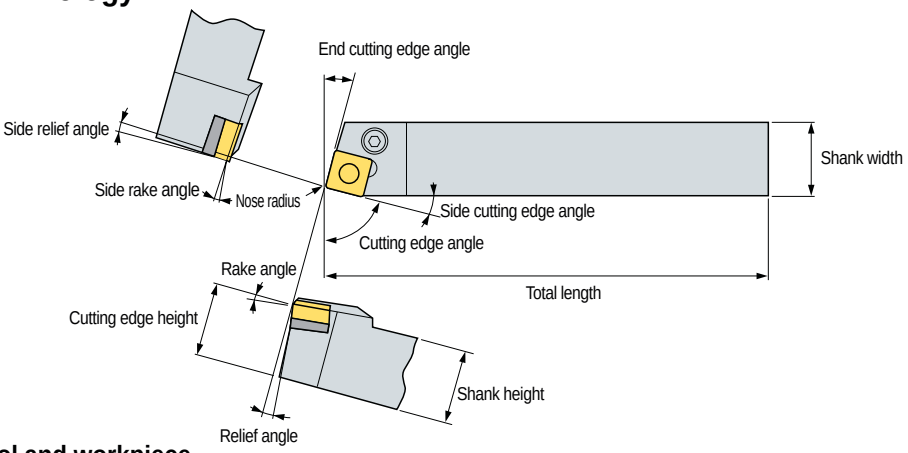
● PC9030, for medium to low speed turning of Stainless steel.

- ▶ By using an ultra fine carbide substrate, the PC9030 has a tougher substrate for moderate speed machining and intermittent cutting of Stainless steel
- ▶ A PVD coating is applied to this grade to enhance chipping-resistance and adhesion-resistance during machining of difficult-to-cut material
- ▶ Exclusive grade for stainless steel, using tougher carbide as a substrate and a PVD coated, this gives the insert superior lubrication properties.
- ▶ Enhance your surface finish and reduce burrs by utilizing our chip-breakers, exclusively made for Stainless steels.

● PC9530, for medium to low speed milling of Stainless steel.

- ▶ Tough ultra-fine carbide substrate primarily used for roughing and/or intermittent milling applications in stainless steel
- ▶ A PVD coating is applied to achieve better tool life in stainless steel and Ni-Cr steel applications.
- ▶ To reduce chipping in the cutting edge Korloy uses a tough carbide substrate and PVD coating to help prevent material build up around the cutting edges.

Insert shape and terminology

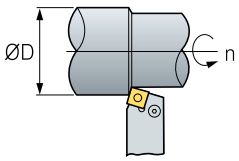


Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side rake angle Rake angle	• Cutting force, Cutting heat, The effects of chip control on tool life	• (+) : Excellent machine-ability (reducing cutting force, weakening cutting edge strength) • (+) : When machining excellent machine-ability or thin workpiece. • (-) : When strong cutting edge is needed at interrupted condition or mill scale.
Relief angle	Relief angle Side relief angle	• Only cutting edge contact with cutting face	• (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear.
Cutting edge angle	Cutting edge angle	• Affects chip control and cutting force direction	• (+) : Improved chip control because chip thickness is big.
	Side cutting edge angle	• Affects chip control and cutting force direction	• (+) : Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-) : Improved chip performance.
	End cutting edge angle	• Prevent friction between cutting edge and cutting face	• (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear.

Calculation formulas for machining

Cutting speed



$$vc = \frac{\pi \times D \times n}{12} \text{ (sfm)}$$

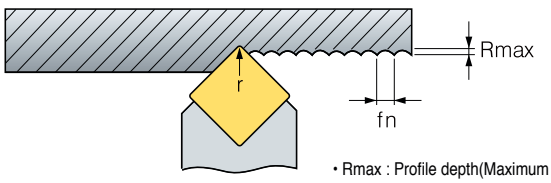
- vc : Cutting speed (sfm)
- D : Diameter (inch)
- n : Revolution per minute (min^{-1})
- π : Circular constant(3.14)

Feed

$$fn = \frac{vf}{n} \text{ (ipr)}$$

- fn : Feed per revolution (ipr)
- vf : Table feed (msfm)
- n : Revolution per minute (min^{-1})

Surface finish



- Rmax : Profile depth(Maximum height roughness) (μ)
- fn : feed (ipr)
- r : nose radius

- Theoretical surface roughness

$$Rmax = \frac{fn^2}{8r} 1000(\mu m)$$

- Practical surface roughness

Steel : Rmax × (1.5~3)
Cast iron : Rmax × (3~5)

Power requirement

$$P_{HP} = \frac{kc \times W \times ap \times fn}{4500 \times \eta} \qquad P_{KW} = \frac{kc \times W \times ap \times fn}{6120 \times \eta}$$

- P_{KW} : Power requirement [kW]
- P_{HP} : Power requirement (horse power) [HP]
- vc : Cutting speed [sfm]
- ap : Depth of cut [inch]
- fn : Feed per revolution [ipr]
- kc : Specific cutting resistance [kg/mm²]
- η : Machine efficiency rate (0.7~0.8)

Rough Kc	
Mild steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

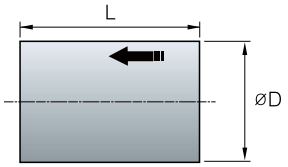
Material removal rate

$$Q \text{ (cm}^3\text{/min)} = vc \times ap \times fn$$

- Q : Material removal rate]
- ap : Depth of cut [sfm]
- vc : Cutting speed [inch]
- fn : Feed per revolution [ipr]

• Machining time

External face machining 1



Constant Revolution per minute

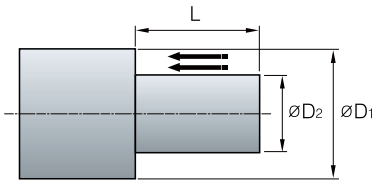
$$T = \frac{60 \times L}{fn \times n}$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times fn \times vc}$$

T : Machining time [sec]
L : Cutting length [inch]
fn : Feed per revolution [ipr]
n : Revolution per minute [inch]
D : Diameter of workpiece [inch]
vc : Cutting speed [sfm]

External face machining 2



Constant Revolution per minute

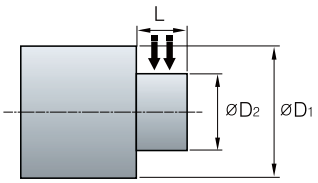
$$T = \frac{60 \times L}{fn \times n} \times N$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times fn \times vc} \times N$$

T : Machining time [sec]
L : Cutting length [inch]
fn : Feed per revolution [ipr]
n : Revolution per minute [min]
D1 : Maximum diameter of workpiece [inch]
D2 : Minimum diameter of workpiece [inch]
vc : Cutting speed [sfm]
N : The number of pass = (D1-D2)/d/2

Facing



Constant Revolution per minute

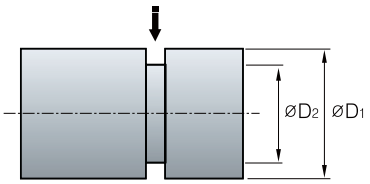
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n} \times N$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc} \times N$$

T : Machining time [sec]
T1 : Machining time before the maximum rpm [sec]
L : Width of machining [inch]
fn : Feed per revolution [ipr]
n : Revolution per minute [min^{-1}]
D1 : Maximum diameter of workpiece [inch]
D2 : Minimum diameter of workpiece [inch]
vc : Cutting speed [sfm]
N : The number of pass = (D1-D2)/d/2

Grooving



Constant Revolution per minute

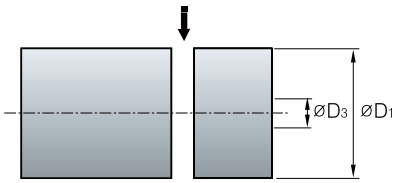
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc}$$

T : Machining time [sec]
T1 : Machining time before the maximum rpm [sec]
L : Width of machining [inch]
fn : Feed per revolution [ipr]
n : Revolution per minute [min^{-1}]
D1 : Maximum diameter of workpiece [inch]
D2 : Minimum diameter of workpiece [inch]
vc : Cutting speed [sfm]

Parting



Constant Revolution per minute

$$T = \frac{60 \times D_1}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3)\ (D_1 - D_3)}{4000 \times fn \times vc}$$

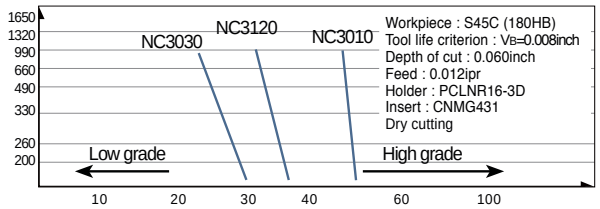
$$T_3 = T_1 + \frac{60 \times D_3}{2 \times fn \times n_{max}}$$

T : Machining time [sec]
T1 : Machining time before the maximum rpm [sec]
T3 : Machining time till maximum RPM [sec]
fn : Feed per revolution [ipr]
n : Revolution per minute [min^{-1}]
nmax : Maximum revolution per minute [min^{-1}]
D1 : Maximum diameter of workpiece [inch]
D3 : Maximum diameter at maximum RPM [inch]
vc : Cutting speed [sfm]

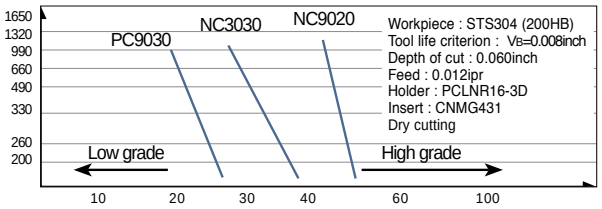
The affects of cutting condition

▶ The most desirable machining means short machining time, long tool life and good precision. This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine.

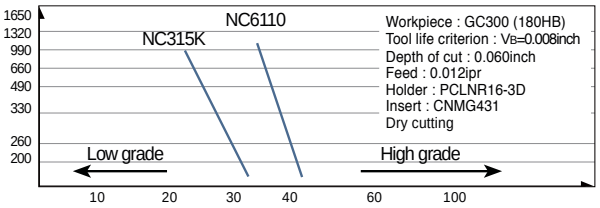
Cutting speed



The tool life feature of P grade



The tool life feature of M grade



The tool life feature of K grade

Cutting Speed's effects

▶ When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%. Although inversely, if the cutting speed increases up to 50% the tool life decreases 20%. On the other hand if cutting speed is too low (66-131sfm) Tool life shortens due to vibration.

Feed

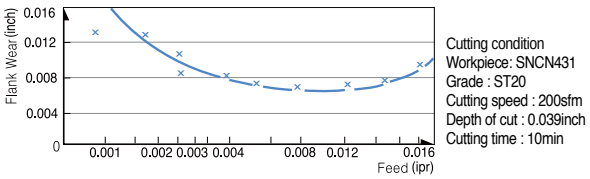
▶ The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution. The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth).

The effects of feed

▶ When the feed rate decreases the flank wear is increased. When the feed rate is too low, the tool life shortens radically.

▶ When the feed rate increases, the flank wear increases due to high temperatures, however the feed rates effects tool life less than the cutting speed. And higher feed rates improve machining efficiency.

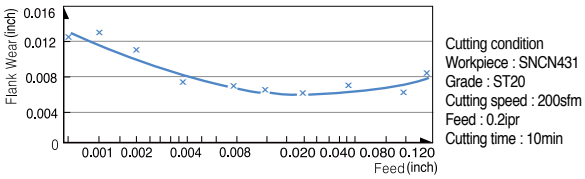
Relationship between feed and flank wear in steel turning



Depth of cut

▶ Determined by the required allowances in machining a material and the capacity the machine can tolerate. There are cutting limits according to the different shapes and sizes of the insert.

Relationship between depth of cut and flank wear in steel turning



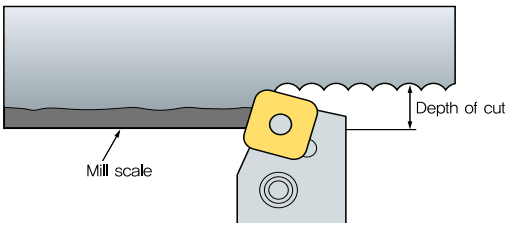
The effect of a depth of cut

▶ The depth of cut does not have a big influence on tool life.

▶ When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life.

▶ When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece.

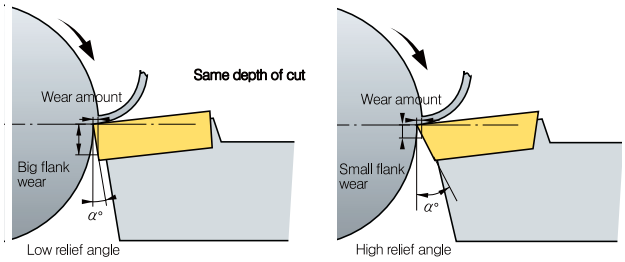
Surface parts including mill scale Roughing

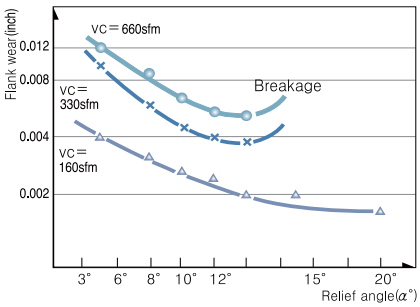


Relief angle

▶ Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily.

• Relationship between various relief angle and flank wear





- Workpiece : 4320(H)
- Grade : P20
- ap : 0.04inch
- fn : 0.013ipr
- T : 20min

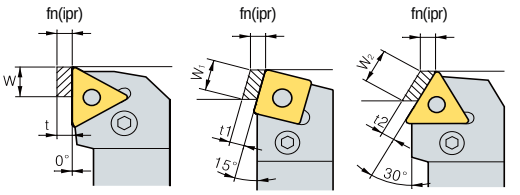
• Affects
1. If relief angle is big Flank wear decreases.
2. If relief angle is big Cutting edge strength weakens.
3. If relief angle is small Chattering occurs.

• Selection system
1. Hard workpiece / When strong cutting edge is needed - Low relief angle
2. Soft workpiece / Workpiece turning to work hardening easily - High relief angle

Side cutting edge angle

▶ Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important.

• Side cutting edge angle and Chip thickness

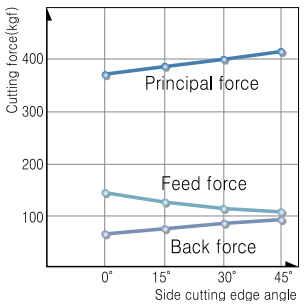


• As side cutting edge angle is getting bigger chips are getting thinner and wider(refer to left picture).

• At the same feed and depth of cut with approach angle 0°
Chip thickness is the same as feed(t=fn) and chip width is equal to depth of cut (W=ap).

t1 = 0.97t, W1 = 1.04W
t2 = 0.87t, W2 = 1.15W

• Side cutting edge angle and 3 cutting forces

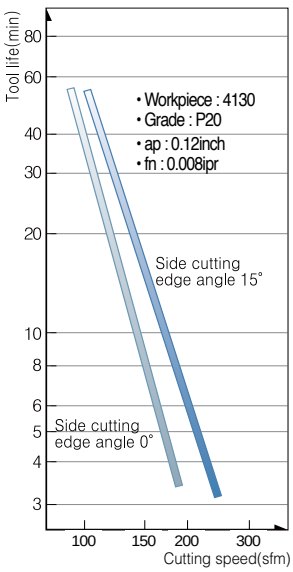


- Workpiece : 4130
- Grade : TNGA433
- vc= 330sfm
- ap= 0.16inch
- fn= 0.018ipr

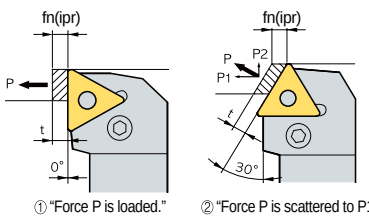
• Affects
1. Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer.
2. Big side cutting edge angle for machining long bars can cause bending.

• Selection system
1. Deep depth of cut finishing / Long thin workpiece / Low machine rigidity - Side cutting edge angle
2. Hard and high calorific power workpiece / Roughing big workpiece / High machine rigidity - Side cutting edge angle

• Side cutting edge angle and Tool life



• Side cutting edge angle and Cutting load



As approach angle gets bigger Back force gets bigger and feed force gets smaller.

• Side cutting edge angle and Cutting performance

Specification	Low ← Approach angle → High	
Wear rate	High	Low
Workpiece	Easy to cut material	Difficult to cut material
Machining power	Small	Big
Chatter	Hard to occur	Easy to occur
How to machine	Finishing	Roughing
Workpiece rigidity	Long thin workpiece	Thick workpiece
Machine rigidity	In case of low rigidity	In case of high rigidity

End cutting edge angle

It affects machined surface to prevent interference between surface of workpiece and insert.

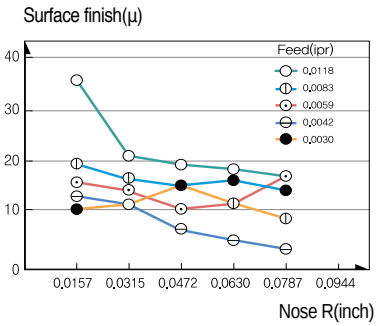
Affects

1. If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases.
2. Small end cutting edge angle can cause chattering due to the increases cutting force.

Nose R

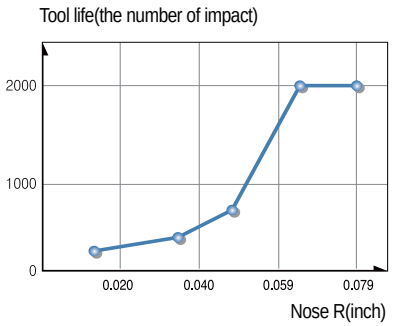
1. Nose R affects not only surface roughness but strength of cutting edge.
2. In general, It's desirable that Nose R is 2~3 times bigger than feed.

● Nose R and surface finish



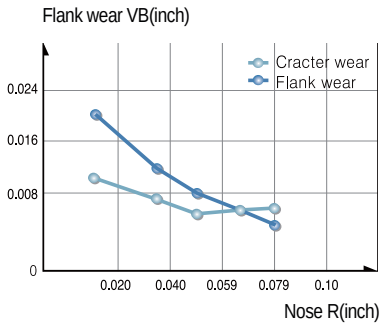
- Workpiece : 4340, HB200
- Grade : P20
- vc = 400sfm, ap = 0.020inch

● Nose R and tool life



- Workpiece : 4140, HB280
- Grade : P10
- vc = 330sfm, ap = 0.02inch
- fn = 0.012ipr

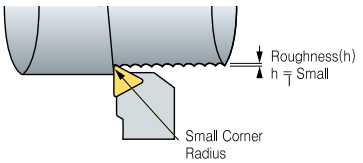
● Nose R and wear of tool



- Workpiece : 4340, HB200
- Grade : P10
- vc = 460sfm, ap = 0.08inch
- fn = 0.008ipr, T = 10min

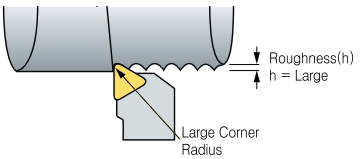
Affects of Nose-R

1. Big Nose R improves surface finish.
2. Big Nose R improves cutting edge strength.
3. Big Nose R reduces flank wear and crater wear.
4. Too big Nose R causes chattering due to increased cutting force.

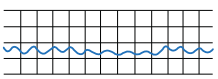
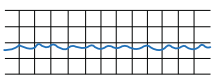
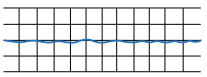
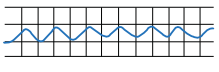
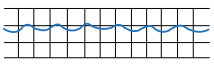
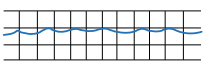
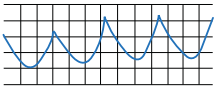
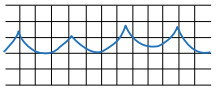
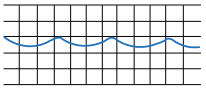


Selection system

1. For finishing with small depth of cut / long and thin workpiece / When machine power is low - Small Nose R
2. For applications that need strong cutting edge such as intermittent and machining mill scale / For roughing of big workpiece / When the machine power is strong eough - Big Nose R



● Relationship between nose radius, feed and various surface roughness.

Feed(ipr) \ Nose R	0.4	0.8	1.2
0.006			
0.010			
0.018			

Cutting edge shape and the affects

● Rake angle (α)

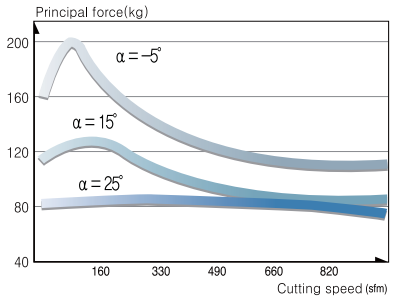
Rake angle has big influence on cutting force, chip flow and tool life.

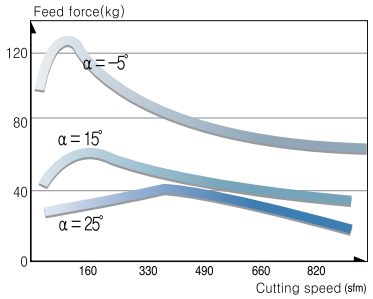
• Affects

1. High rake angle results in good suface finish.
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge.

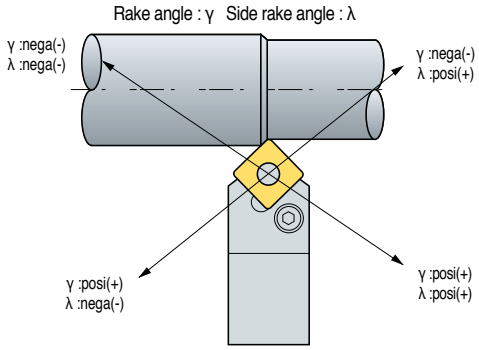
• Selection system

1. For hard workpiece / For applications that need strong cutting edge such as interrupted and machining mill scale
   - Low rake angle
2. For soft workpiece / Easy to cut material / When the rigidity of machine power and workpiece is low - High rake angle

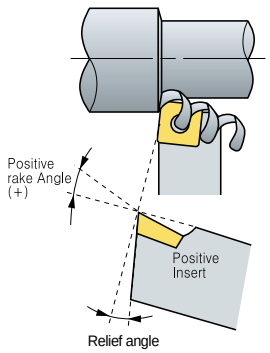


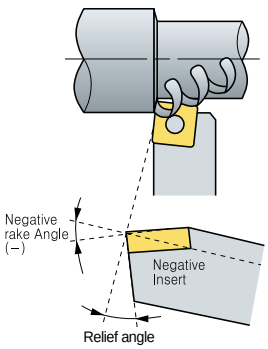


● Rake angle and the direction of chip flow



In order to prevent machined surface from damages Avoid nega, posi combination. γ :nega(-) λ :posi(+)





Selecting proper tools

Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions.
However, It can be simplified by classifying basic factors below.

● Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A.

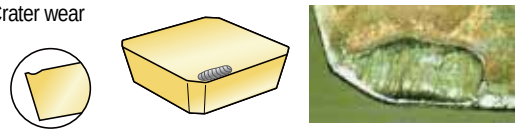
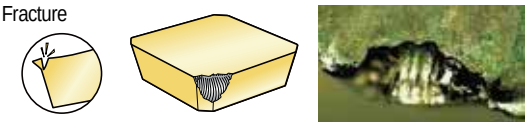
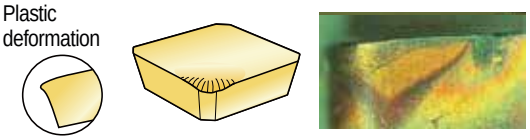
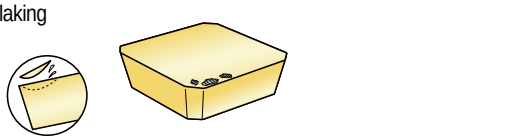
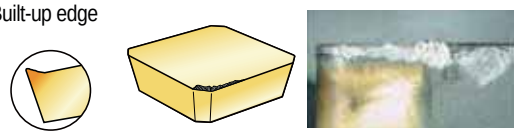
A : Basic factors

· Workpiece material
· Workpiece shape
· Workpiece size
· Hardness of workpiece
· Surface roughness of workpiece (before machining)
· Surface finish required
· Type of lathe machine
· Condition of lathe machine (rigidity, power etc)
· Horse power of machine
· Clamping method of workpiece

B : Selection system

① Select as big approach angle as possible.
② Select as big shank as possible.
③ Select as strong cutting edge of insert as possible
④ Select as big nose radius as possible
⑤ In finishing, Select the insert using many corners
⑥ Select as small insert as possible
⑦ Cutting speed should be determined carefully according to cutting conditions
⑧ Select as deep depth of cut as possible
⑨ Select as fast feed as possible
⑩ Cutting condition should be determined within chip breaker application ranges.

Trouble shooting

Tool Failure	Cause	Solution
Crater wear 	• Improper grade • Excessive cutting condition	• Choose harder grade • Decrease cutting condition
Fracture 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder
Plastic deformation 	• Improper grade • Excessive cutting condition • High cutting temperature	• Choose harder grade • Decrease cutting condition • Choose grade wich heat conductivity are big
Wear on nose radius (Flank wear) 	• When the hardness of workpiece is too high compare with tool • When machinig surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed	• Choose harder grade • Decrease cutting speed • Choose lager relief angle • Increase feed
Thermal crack 	• Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation)	• Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade
Chipping 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder
Notch wear 	• Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration)	• Choose harder grade • Improve chip control form large rake angle
Flaking 	• Deposition on cutting edge • Bad chip control	• Improve cutting performance fromd large rake angle • Apply to chip pocket with big size
Complete breakage 	• Unusable condition due to wear off the most parts of cutting edge by progress of wear	• Reduce the feed rate. • Reduce the depth of cut. • Select a tougher grade. • Select a stronger chipbreaker. • Select a thicker insert.
Built-up edge 	• Slow cutting speed • Sticky materials	• Increase cutting speed. • Use more positive rake geometry. • Use tougher grade

Types of tool failure and trouble shooting

Troubles	Causes	Solution																	
		Cutting conditions				Selecting insert grade				Tool shape							Machine clamping		
		Cutting speed	Feed	Depth of cut	Coolant	Select harder grade	Select tougher grade	Select better heat-impact resistance grade	Select better adhesion resistance grade	Chip breaker valuation	Rake angle	Nose radius	Side cutting edge angle	Cutting edge strength Honing	Improving insert precision M class → G class	Clamping workpiece	Clamping workpiece	Holder overhang	Machine vibration
Poor precision Unstable machining size	Insert precision is variable														●				
	Workpiece, Separation of tool									●	⬆	⬇				●	●	●	●
Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation.	Flank wear increase					●						⬆							
	Cutting condition is improper	⬇	⬆																
Poor surface roughness for finishing Criterion of tool life.	Weakened cutting force by increasing wear of tool	⬇			Wet cutting	●			●	●	⬆	⬆		⬇	●				
	Cutting edge chipping		⬇	⬇			●			●		⬆		⬆			●	●	●
	Adhesion, built-up edge	⬆	⬆		Wet cutting				●	●	⬆			⬇	●				
	Improper cutting conditions	⬆	⬇	⬇	Wet cutting														
	Improper tool and shape of cutting edge									●		⬆		⬇	●				
	Vibration, chattering	⬇	⬇	⬇	Wet cutting		●			●	⬆	⬇		⬇		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	⬇	⬇	⬇		●													
	Improper tool and shape of cutting edge									●	⬆			⬇					
Burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	⬇	⬆		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆	⬇		⬇					
Cast iron (Weak chipping)	Improper cutting conditions		⬇	⬇		●													
	Wear on the tool, improper shape of cutting edge									●	⬆	⬆		⬇		●	●	●	●
Soft steel (nap)	Improper cutting conditions	⬆	⬍		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆			⬇					

⬆ : Increase ⬇ : Decrease ● : use ◉ : Correct use

Tool life criterion

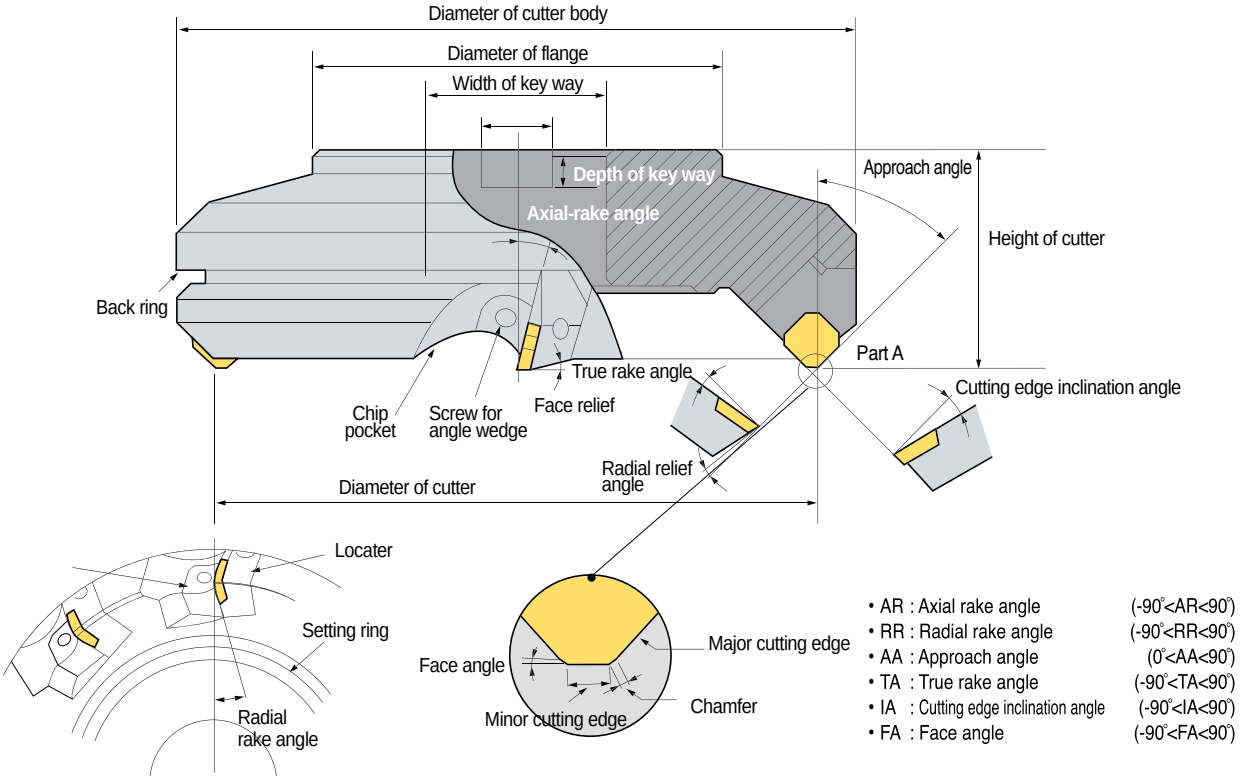
● KS B0813

Flank wear width	0.008inch	Precision light cutting , Finishing in nonferrous alloy
	0.016inch	Machining special steel
	0.028inch	General cutting in cast iron, steel etc
	0.040~0.050inch	General cutting in cast iron, steel etc
Depth of crater wear	In general 0.002 ~ 0.004 inch	

● ISO(B8688)

Tool life criterion	Application
Complete breakage	Machining special steel
Flank wear width VB = 0.012inch	Even flank wear of cemented carbides, Ceramic tool
VBmax = 0.020inch	Uneven flank wear
Crater wear width KT = 0.06+0.3fmm (f:mm/ipr)	Cemented carbides tool
Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10㎛Ra	When surface roughness is important

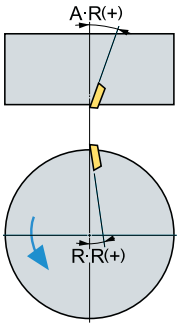
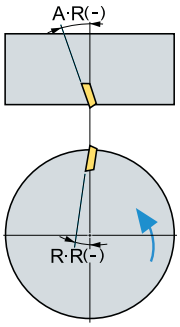
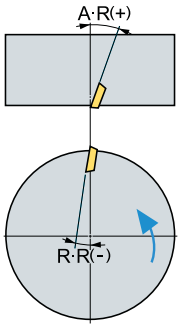
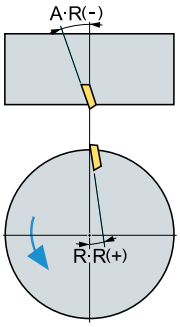
Milling cutter shape and designation



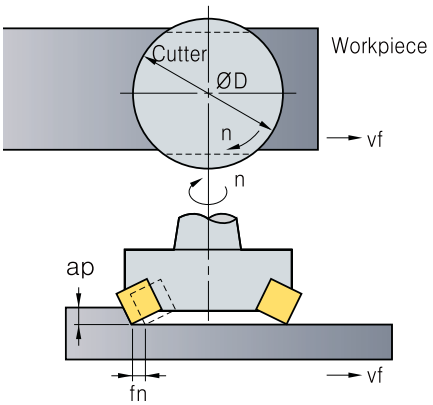
● The terminology and functions of cutting edge angle

No.	Tool failure	Symbol	Function	Effects
1	Axial rake angle	A.R	Chip flow direction, Adhesion	Positive : Excellent cutting, built-up edge prevented.
2	Radial rake angle	R.R	Affecting on thrust	Negative : Excellent chip control
3	Approach angle	A.A	Chip thickness, Determines flow direction	(+) : Chip thickness become thinner, cutting force could be reduced
4	True rake angle	T.A	Effective rake angle	(+) : Better cutting. Preventing adhesion, Weakening cutting edge strength. (–) : Cutting edge strength increases, easy to adhere
5	Cutting edge inclination angle	I.A	Determines chip flow direction	(+) : Good chip flow, cutting force could decreases, Comer edge strength weakens
6	Relief angle	F.A	Controlling cutting edge strenght, tool life and chattering	Surface roughness increases as F.A gets close to 0 degree.

Features by combination of rake angle

	Double positive angle	Double negative angle	Posi - Negative angle	Nega - Positive angle
				
Use	• General machining of steel, cast iron, stainless steel • Machining soft steel that brings about built-up edge easily • Machining material having tendency to poor surface roughness	• Under interrupted cutting condition • Roughing of cast iron and steel	• Machining difficult to cut material • Roughing with deep depth of cut and wide width of cut in steel and cast iron	• Chip flows to center of cutter body
Advantages	• As for tough workpiece material It prevents built-up edge to improve surface roughness. • Low cutting load and better machinability	• Strong cutting edge. • Roughing of workpiece that has bad surface condition containing sand, mill scale • Double sided inserts can be applied(Economical). • Good chip control.	• Good chip flow and machinability. • Suitable for machining of difficult-to-cut material • Un-even partition clamping prevents chattering	-
Disadvantages	• Weak cutting edge strength. • Only single sided inserts are available (No economical). • Machine and cutter need enough power and rigidity.	• Machine and cutter need enough power and rigidity.	• Only single sided inserts are available (No economical)	• Since the chips flows toward the center of cutter. Chips scratch on machined surface. • Bad chip flow. • No economical

Major cutting formulas



● Cutting speed

$$vc = \frac{\pi \cdot D \cdot n}{1000} \text{ (sfm)}$$

- vc : Cutting speed (sfm)
- D : Diameter of tool (inch)
- n : Revolution per minute (min^{-1})
- π : Circular constant (3.14)

● Feed

$$fz = \frac{vf}{z \cdot n} \text{ (ipt)}$$

- fz : Feed per tooth (ipt)
- vf : Feed per minute (ipm)
- n : Revolution per minute (min^{-1})
- z : Number of tooth

● Chip removal amount

$$Q = \frac{L \times vf \times ap}{1000} \text{ } (cm^3/min)$$

- Q : Chip removal amount (cm^3/min)
- L : Width of cut (inch)
- vf : Table feed (ipm)
- ap : Depth of cut (inch)

● Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \qquad H = \frac{P_{kw}}{0.75} \text{ (hp)}$$

- Pc : Power requirement (kW)
- H : Horse power requirement (hp)
- Q : Chip removal amount (cm^3/min)
- kc : Specific cutting resistance (kgf/mm^2)
- η : Machine efficiency rate (0.7~0.8)

● Machining time

$$T = \frac{60 \times Lt}{vf} \text{ (sec)}$$

- T : Machining time (sec)
- Lt : Total length of table feed (inch)(=Lw+D+2R)
- Lw : The length of workpiece (inch)
- D : The diameter of cutter body (inch)
- vf : Table feed (ipm)
- R : Relief length (inch)

● True rake angle / Cutting edge inclination angle

True rake angle $\quad tan(T) = tan(R) \times cos(AA) + tan(A) \times sin(C)$

Cutting edge inclination angle $\quad tan(I) = tan(A) \times cos(AA) - tan(R) \times sin(C)$

Values of specific cutting resistance

Workpiece	Tensile strength (kg/mm²) and hardness	Specific cutting resistance according to various feed kc(MPa)				
		0.004 (ipt)	0.008 (ipt)	0.012 (ipt)	0.016 (ipt)	0.024 (ipt)
Soft steel	52	220	195	182	170	158
Medium carbon steel	62	198	180	173	160	157
High carbon steel	72	252	220	204	185	174
Tool steel	67	198	180	173	170	160
Tool steel	77	203	180	175	170	158
Chrome manganese steel	77	230	200	188	175	166
Chrome manganese steel	63	275	230	206	180	178
Chrome molybdenum steel	73	254	225	214	200	180
Chrome molybdenum steel	60	218	200	186	180	167
Nickel Chrome molybdenum steel	94	200	180	168	160	150
Nickel Chrome molybdenum steel	HB352	210	190	176	170	153
Cast steel	52	280	250	232	220	204
Hardened cast iron	HRC46	300	270	250	240	220
Meehanite cast iron	36	218	200	175	160	147
Gray cast iron	HB200	175	140	124	105	97
Brass	50	115	95	80	70	63
Light alloy(Al - Mg)	16	58	48	40	35	32
Light alloy(Al - Si)	20	70	60	52	45	39

Chip removal amount(cm³/min) per rated horse power

Workpiece \ Rated horse power		5Hp	10Hp	20Hp	30Hp	40Hp	50Hp
Steel	Soft	32	75	163	295	425	570
	Medium	26	55	127	212	310	425
	hard	18	41	93	163	228	310
Cast iron	Soft	52	116	260	455	670	880
	Medium	32	75	163	295	425	570
	hard	26	55	127	212	310	425
Bronze Brass	Soft	77	163	390	670	980	1,280
	Medium	54	118	275	490	700	910
	hard	26	55	127	245	325	425
Aluminum		90	195	440	780	1,110	1,500

Selection of MILL-MAX diameter(D)

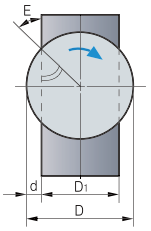
● Selection by machine rigidity

Machine horse power(PS)	10 ~ 15	15 ~ 20	Over 20
Proper cutter body specification(inch)	ø3.15 ~ ø3.94	ø4.92 ~ ø6.30	ø6.30 ~ ø7.87

● Selection by machine rigidity

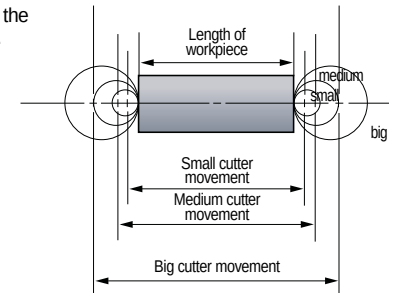
Workpiece	E	δ
Steel	+20°~-10°	3 : 2
Cast iron	Under +50°	5 : 4
Light alloy	Under +40°	5 : 3

D : External diameter of cutter body
D1 : Width of workpiece
d : Projected part of cutter body
E : Engage angle
δ : Ratio of cutter body and width of workpiece(D:D1)



● Selection by machining time

The bigger size cutter the longer machining time.

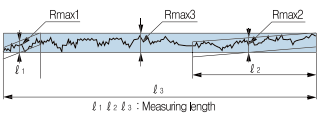
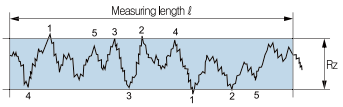
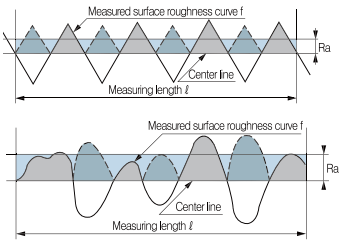


● Selection by number of tooth

Workpiece	Steel	Cast iron	Light alloy
Number of tooth	D×(1~1.5)	D×(1~4)	D×1+α

ex) D=ø100 ⇒4″×(1~1.5)=4~6 D is the size of cutter body converted into inch size.

Classification of surface roughness

Type	Symbol	How to calculate	Measured value
Maximum height	Rmax	• The distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve (Expressed by unit: μ). • Exclude extraordinary values(too small or big) that look like grooves or mountains.	
+10 point mean roughness	Rz	• Sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute value of the highest profile peaks and the depths of five deepest profile valleys measured in the vertical magnification is expressed by micro meter(μ).	
Arithmetic mean roughness	Ra	• Sampling only the reference length from the roughness curve in the direction of mean line , taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and is expressed by micro meter(μ). • Generally, Read measured value by Ra measurer.	

Finish mark		▽▽▽▽	▽▽▽	▽▽	▽	~
Surface roughness	Rmax	0.8s	6.3s	25s	100s	Unspecified
	Rz	0.8z	6.3z	25z	100z	
	Ra	0.2a	1.6a	6.3a	25a	

Trouble shooting for milling

Troubles	Causes	Solution										
		Cutting conditions				Tool shape					Insert grade	
		Cutting speed	Depth of cut	Feed	Feed	Rake angle	Relief angle	Approach angle	Chattering at cutting edge	Nose radius	Toughness	Hardness
Flank wear	• Improper insert grade • Improper cutting conditions • Chattering	⬇		⬆			⬆	⬇		⬆		⬆
Crater wear	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	●	⬆				⬇		⬆
Chipping	• Lack of insert toughness • Excessive feed • Excessive cutting load			⬇		⬇	⬇	⬇		⬆	⬆	
Built-up edge	• Improper cutting conditions • Improper cutting edge shape • Improper insert grade	⬆	⬇	⬆		⬆				⬇		
Chattering	• Improper cutting conditions • Lack of number of cutting teeth • Improper cutting edge shape • Bad chip flow • Unstable workpiece clamping		⬇	⬇	●	⬆		⬆	⬇	⬇		
Poor surface finish	• Built-up edge • Improper cutting conditions • Chattering • Bad chip flow	⬆	⬇	⬇	●	⬆			⬇	⬆		
Thermal crack	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	◉	⬆				⬆	⬆	
Fracture	• Improper insert grade • Excessive cutting load • Bad chip flow • Chattering • Excessive overhang		⬇	⬇	●						⬆	

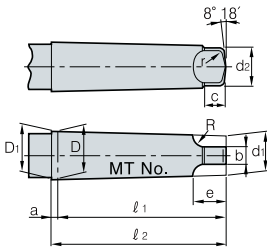
⬆ : Increase ⬇ : Decrease ● : use ◉ : Correct use

General formulas for milling

● Machine efficiency rate (η)

Power transmission mode	Efficiency rate (E)	Reference
Principal axis direct connection driving	0.90	
Belt driving	0.85	Double connection : 0.85 × 0.85 ≒ 0.70
Starting driving	0.75	
Oil pressure driving	0.60~0.90	

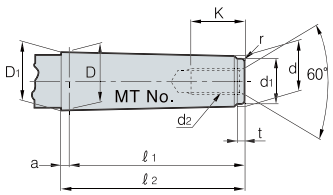
● Morse taper (Tang type)



(mm)

MT No.	Taper	Taper angle(α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1°29′27″	9.045	3.0	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1.0
1	1/20.047	1°25′43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
2	1/20.020	1°25′50″	17.780	5.0	18.030	14.034	75.0	80.0	13.5	6.3	10.0	16.0	6	1.6
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.107	94.0	99.0	18.5	7.9	13.0	20.0	7	2.0
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16.0	24.0	8	2.5
5	1/19.002	1°30′26″	44.399	6.5	4.741	36.531	149.5	156.0	35.7	15.9	19.0	29.0	10	3.0
6	1/19.180	1°29′36″	63.348	8.0	63.765	52.399	210.0	218.0	51.0	19.0	27.0	40.0	13	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	68.186	286.0	296.0	66.8	28.6	35.0	54.0	19	5.0

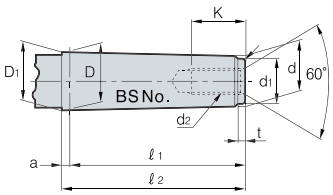
● Morse taper (Screw type)



(mm)

MT No.	Taper	Taper angle(α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1°29′27″	9.045	3.0	9.201	6.442	50.0	53	6.0	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9.0	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5.0	18.030	14.583	64.0	69	14.0	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.759	81.0	86	19.0	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25.0	M16	32	9	1.0
5	1/19.002	1°30′26″	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29′36″	63.348	8.0	63.765	53.859	182.0	190	51.0	M24	50	12	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	70.058	250.0	260	65.0	M33	80	18.5	5.0

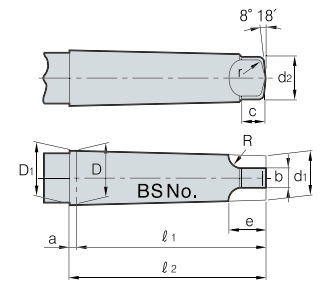
● Brown sharp taper (Screw type)



(mm)

B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	0.6	M12(1/2)	28
9	27.104	3.2	27.238	22.863	21.0	101.6	104.8	4	0.6	M12(1/2)	28
10	32.749	3.2	32.887	26.534	24.0	144.5	147.7	5	1.0	M16(5/8)	32
11	38.905	3.2	39.039	31.749	29.0	171.4	174.6	5	1.0	M16(5/8)	32
12	45.641	3.2	45.774	38.103	35.0	181.0	184.2	6	2.5	M20(3/4)	40
13	52.654	3.2	52.787	44.451	41.0	196.8	200.0	6	3.0	M20(3/4)	40
14	59.533	3.2	59.666	50.800	47.0	209.6	212.8	7	4.0	M24(1)	40
15	66.408	3.2	66.541	57.150	53.0	222.2	225.4	7	4.0	M24(1)	50
16	73.292	3.2	73.425	63.500	59.0	35.0	238.2	8	5.0	M30(11/8)	60

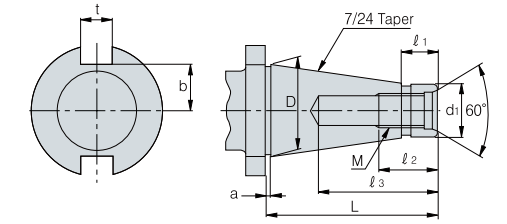
● Brown sharp taper (Tang type)



(mm)

B&S No.	D	a	D1	d1	d2	ℓ1	ℓ2	b	c	e	R	r
4	10.221	2.4	10.321	8.458	8.1	42.1	44.5	5.5	8.7	14.4	7.9	1.3
5	13.286	2.4	13.386	10.962	10.7	55.6	58.0	6.3	9.5	16.2	7.9	1.5
6	15.229	2.4	15.330	12.167	11.7	73.0	75.4	7.1	11.1	18.0	7.9	1.5
7	18.424	2.4	18.524	14.675	14.2	89.7	92.1	7.9	11.9	20.3	9.5	1.8
8	22.828	3.2	22.962	18.453.	18.0	104.8	108.0	8.7	12.7	22.0	9.5	2.0
9	27.104	3.2	27.238	22.200	21.8	117.5	120.7	9.5	14.3	25.4	11.1	2.5
10	32.749	3.2	32.887	25.751	25.7	162.7	165.9	11.1	16.7	28.1	11.1	2.8
11	38.905	3.2	39.039	30.985	30.7	189.7	192.9	11.1	16.7	30.0	12.7	3.3
12	45.641	3.2	45.774	37.246	37.1	201.6	204.8	12.7	190	32.5	12.7	3.8
13	52.654	3.2	52.787	43.589	43.4	217.5	220.7	12.7	19.0	35.7	15.9	4.3
14	59.533	3.2	59.666	49.841	49.8	232.6	235.8	14.2	21.4	41.2	19.0	4.8
15	66.408	3.2	66.541	56.186	56.1	245.3	248.5	14.2	21.4	44.4	22.2	5.3
16	73.292	3.2	73.425	62.441	62.2	260.4	263.6	15.8	23.8	50.0	25.4	5.8

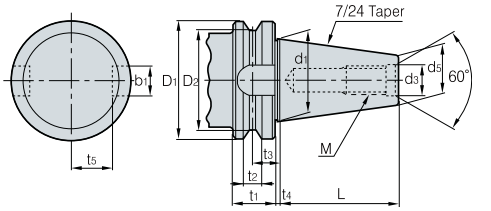
● Standard taper of American milling machine



(mm)

NT No.	Dimensions	D	D1	L	ℓ1	M	ℓ2	ℓ3	a	t	b
30	1 1/4	31.750	17.40 -0.29 -0.36	70	20	UNC 1/2"	24	50	1.6	15.9	6.0
40	1 3/4	44.450	25.32 -0.30 -0.384	95	25	UNC 5/8"	30	60	1.6	15.9	22.5
50	2 3/4	69.850	39.60 -0.31 -0.41	130	25	UNC 1"	45	90	3.2	25.4	35.0
60	4 1/4	107.950	60.20 -0.34 -0.46	210	45	UNC 1 1/4"	56	110	3.2	25.4	60.0

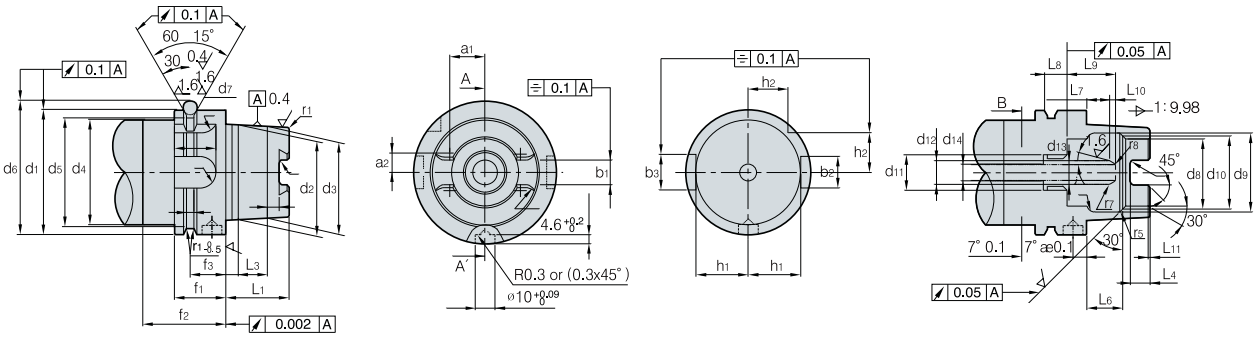
● Bottle grip taper



(mm)

BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12×1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16×2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	19.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	25.7	60.1	60.7

● HSK shank (DIN 69893)



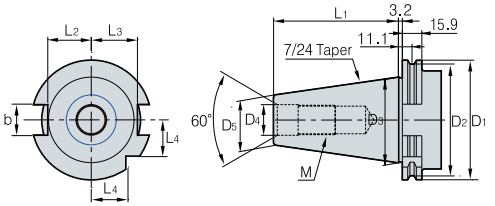
(mm)

HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.30	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.50	16	14	63	48	46.53	53	55	72.30	7	34	40	37	M18X1	12	8.0	8.4	17.862	9.250
100	20.00	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12.0	12.0	27.329	15.000

(mm)

HSK No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
50	26	42	18	3.75	2.0	15.5	25	5.0	11.0	7.5	4.5	14.13	10.0	10	23.0	3	1	19	1	1.5	2.38	6	0.5	1.0	2	6
63	26	42	18	3.75	28.5	20.0	32	6.3	14.7	10.0	6.0	18.13	10.0	12	24.5	3	1	21	1.2	1.5	3.00	8	0.6	1.5	3	8
100	29	45	20	3.75	44.0	31.5	50	10.0	24.0	15.0	10.0	28.56	12.5	16	28.0	3	1.5	24	2	2.0	3.00	12	1.0	1.5	3	10

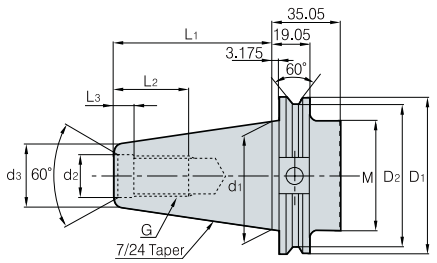
● DIN 69871



(mm)

Shank No	D1	D2	D3	D4	D5	L1	L2	L3	L	b	M
30	50.0	44.3	31.75	13	17.8	47.8	16.4	19.0	33.5	16.0	M12×1.75
40	63.5	56.2	44.45	17	24.5	68.4	22.8	25.0	42.5	16.1	M16×2
45	82.5	57.2	57.15	21	33.0	82.7	29.1	31.3	52.5	19.3	M20×2.5
50	97.5	91.2	68.85	25	40.1	101.7	35.5	37.7	61.5	25.7	M24×3

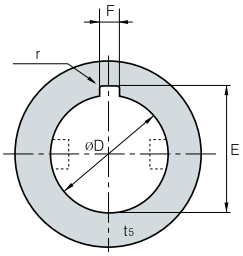
● CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	M16×2	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	M20×25	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	M24×3	69.85	26.19	35.05	101.6	44.45	6.35	1-8

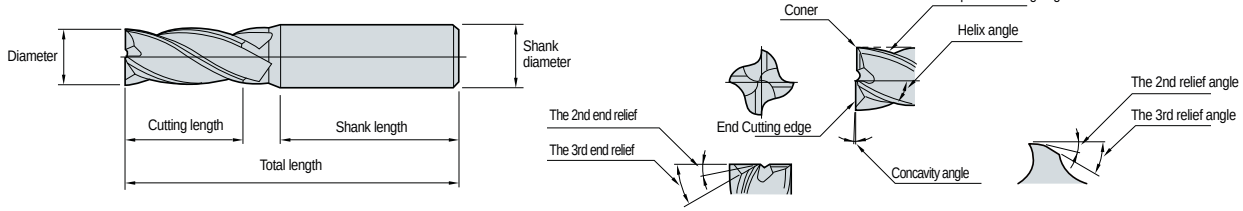
● Standard of milling cutter hole (KSB3203)



● Type B

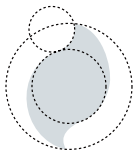
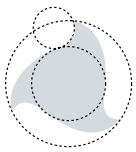
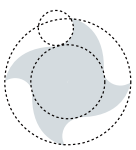
Diameter	øDH7	E	F	r
1/2	12.70 +0.018 0	14.17 +0.25 0	2.38 +0.31 +0.13	0.5
5/8	15.875 +0.018 0	17.74 +0.25 0	3.18 +0.31 +0.13	0.8
3/4	19.050 +0.021 0	20.89 +0.25 0	3.18 +0.31 +0.13	0.8
7/8	22.225 +0.021 0	24.07 +0.25 0	3.18 +0.31 +0.13	0.8
1	25.40 +0.021 0	28.04 +0.25 0	6.35 +0.31 +0.13	1.2
1 1/4	31.750 +0.025 0	35.18 +0.25 0	7.94 +0.32 +0.14	1.6
1 1/2	38.10 +0.025 0	42.32 +0.25 0	9.53 +0.89 +0.25	1.6
1 3/4	44.450 +0.025 0	49.48 +0.25 0	11.11 +0.89 +0.25	1.6
2	50.80 +0.03 0	55.83 +0.25 0	12.7 +0.89 +0.25	1.6
2 1/2	63.50 +0.03 0	69.42 +0.25 0	15.81 +0.89 +0.25	1.6
3	76.20 +0.03 0	82.93 +0.25 0	19.05 +0.89 +0.25	2.4
3 1/2	88.90 +0.035 0	98.81 +0.25 0	22.23 +0.89 +0.25	2.4
4	101.60 +0.035 0	111.51 +0.25 0	25.4 +0.89 +0.25	2.4
4 1/2	114.30 +0.035 0	125.81 +0.25 0	25.58 +0.89 +0.25	3.2
5	127.0 +0.04 0	140.08 +0.25 0	31.75 +0.89 +0.25	3.2

Endmill's shape and names



The comparison according to number of flute

● Features of number of flute

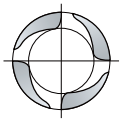
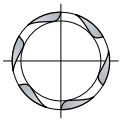
Ø10mm	2 flutes (IFE2100)	3 flutes (IFE3100)	4 flutes (IFE4100)
Shape			
Cross section	44mm^2	46mm^2	48mm^2
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	Medium, finishing	Finishing

● Affection of number of flute

Specification	Major features	2 flutes	4 flutes
Tool rigidity	Torsional rigidity	○	◎
	Bending rigidity	○	◎
Surface finish	Surface roughness	○	◎
	Machining precision	○	◎
Chip control	Chip clogging	◎	○
	Chip evacuation	◎	○
Grooving	Chip evacuation	◎	○
	Grooving	◎	○
Side facing	Surface finish	○	◎
	Vibration	◎	○

◎-Excellent ○-Good

The differences between general endmills and high speed endmills

General endmills		High speed endmills	
Cross section shape	Features	Cross section shape	Features
	- Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece(general steel, cast iron)		- Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel

Calculations of cutting condition

● Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{12} \qquad n = \frac{12 \times vc}{\pi \times D}$$

● Calculations of feed speed

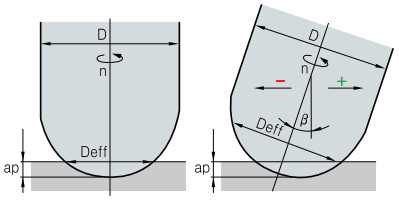
$vf = n \times fn$ or $n \times fz \times z$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc : Cutting speed(sfm)
π : Circular constant (3.141592)
D : Endmill diameter(inch)
n : Revolution per minute(min^{-1})
vf : Feed speed(ipm)
fn : Feed per revolution(ipr)
fz : Feed per flute (ipt)
z : Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 12}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{12}$
Feed per tooth	$fz = \frac{vf}{z \times n}$
Feed per revolution	$fn = fz \times z$
Feed speed	$vf = fz \times z \times n$
Chip removal rate	$Q = ae \times ap \times vf$
Effective diameter of Ball Endmill	



$D_{eff} = 2 \times \sqrt{D \times ap - ap^2}$ Calculation Table

$D_{eff} = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$

The affection of flute length

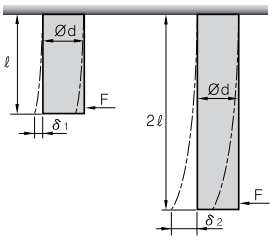
● Expression of aspect ratio

- Aspect ratio
- ℓ/d
- Ex) 3D, 15D, 22D

● Deformation rate according to length

- Deformation rate is reaction force against external force.
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher.

$$\delta = \frac{P\ell^3}{3EI}$$



δ = Deformation volume **ℓ** = Length of cut

P = Cutting force **E** = Elasticity coefficient

I = Inertia moment ($I = \frac{\pi d^4}{64}$)

- ℓ → 2ℓ
- δ1 → δ1 = 8δ1 = δ2

Spindle revolution conversion table(RPM) - external diameter

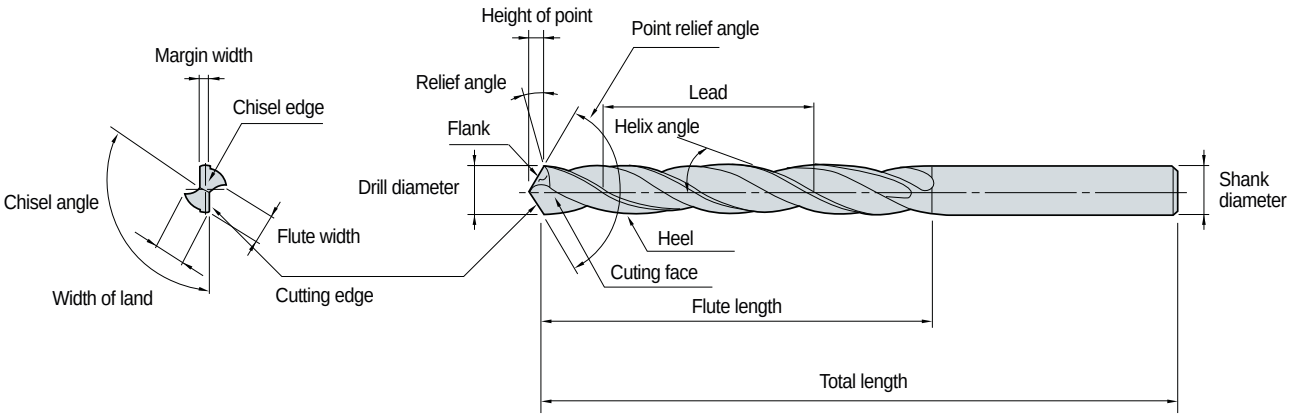
VC / External	Cutting speed (vc, sfm)															
	20	30	130	160	190	230	260	300	330	460	490	590	590	660	820	990
0.008	31,831	47,746	63,662	79,577	95,493	111,408	127,324	143,239	159,155	190,986	222,817	23,872	286,479	318,310	397,887	477,465
0.012	21,221	31,831	42,441	53,052	63,662	74,272	84,883	95,493	106,103	127,324	148,545	159,155	190,986	212,207	265,258	318,310
0.016	15,915	23,873	31,831	39,789	47,746	55,704	63,662	71,620	79,577	95,493	111,408	119,366	143,239	159,155	198,944	238,732
0.020	12,732	19,099	25,465	31,831	38,197	44,563	50,930	57,296	63,662	76,394	89,127	95,493	114,592	127,324	159,155	190,986
0.024	10,610	15,915	21,221	26,526	31,831	37,136	42,441	47,746	53,052	63,662	74,272	79,577	95,493	106,103	132,629	159,155
0028	9,095	13,642	18,189	22,736	27,284	31,831	36,378	40,926	45,473	54,567	63,662	68,209	81,851	90,946	113,682	136,419
0.032	7,958	11,937	15,915	19,894	23,873	27,852	31,831	35,810	39,789	47,746	55,704	59,683	71,620	79,577	99,472	119,366
0.036	7,074	10,610	14,147	17,684	21,221	24,757	28,294	31,831	35,368	42,441	49,515	53,052	63,662	70,736	88,419	106,103
0.040	6,366	9,549	12,732	15,915	19,009	22,282	25,465	28,648	31,831	38,197	44,563	47,746	57,296	63,662	79,577	95,793
0.059	4,244	6,366	8,488	10,610	12,732	14,854	16,977	19,099	21,221	25,465	29,709	31,831	38,197	42,441	53,052	63,662
0.079	3,183	4,775	6,366	7,958	9,549	11,141	12,732	14,324	15,915	19,099	22,282	23,873	28,648	31,831	39,789	47,746
0.098	2,546	3,820	5,093	6,366	7,639	8,913	10,186	11,459	12,732	15,279	17,825	19,099	22,918	25,465	31,831	38,197
0.118	2,122	3,183	4,244	5,305	6,366	7,427	8,488	9,549	10,610	12,732	14,854	15,915	19,099	21,221	26,526	31,831
0.138	1,819	2,728	3,638	4,547	5,457	6,366	7,276	8,185	9,095	10,913	12,732	13,642	16,370	18,189	22,736	27,284
0.158	1,592	2,387	3,183	3,979	4,775	5,570	6,366	7,162	7,958	9,549	11,141	11,937	14,324	15,915	19,894	23,873
0.177	1,415	2,122	2,829	3,537	4,244	4,951	5,659	6,366	7,074	8,488	9,903	10,610	12,732	14,147	17,684	21,221
0.197	1,273	1,910	2,546	3,183	3,820	4,456	5,093	5,730	6,366	7,639	8,913	9,549	11,459	12,732	15,915	19,099
0.217	1,157	1,736	2,315	2,894	3,472	4,051	4,630	5,209	5,787	6,945	8,102	8,681	10,417	11,575	14,469	17,362
0.236	1,061	1,592	2,122	2,653	3,183	3,714	4,244	4,775	5,305	6,366	7,427	7,958	9,549	10,610	13,263	15,915
0.256	979	1,469	1,959	2,449	2,938	3,428	3,918	4,407	4,897	5,876	6,856	7,346	8,815	9,794	12,243	14,691
0.276	909	1,364	1,819	2,274	2,728	3,183	3,638	4,093	4,547	5,457	6,366	6,821	8,185	9,095	11,368	13,642
0.295	849	1,273	1,698	2,122	2,546	2,971	3,395	3,820	4,244	5,093	5,942	6,366	7,639	8,488	10,610	12,732
0.315	796	1,194	1,592	1,989	2,387	2,785	3,183	3,581	3,979	4,775	5,570	5,968	7,162	7,958	9,947	11,937
0.335	749	1,123	1,498	1,872	2,247	2,621	2,996	3,370	3,745	4,494	5,243	5,617	6,741	7,490	9,362	11,234
0.354	707	1,061	1,415	1,768	2,122	2,476	2,829	3,183	3,537	4,244	4,951	5,305	6,366	7,074	8,842	10,610
0.374	670	1,005	1,340	1,675	2,010	2,345	2,681	3,016	3,351	4,021	4,691	5,026	6,031	6,701	9,377	10,052
0.394	637	955	1,273	1,592	1,910	2,228	2,546	2,865	3,183	3,820	4,456	4,775	5,730	6,366	7,958	9,549
0.433	579	868	1,157	1,447	1,736	2,026	2,315	2,604	2,894	3,472	4,051	4,341	5,209	5,787	7,234	8,681
0.472	531	796	1,061	1,326	1,592	1,857	2,122	2,387	2,653	3,183	3,714	3,979	4,775	5,305	6,631	7,958
0.512	490	735	979	1,224	1,469	1,714	1,959	2,204	2,449	2,938	3,428	3,673	4,407	4,897	6,121	7,346
0.551	455	682	909	1,137	1,364	1,592	1,819	2,046	2,274	2,728	3,183	3,410	4,093	4,547	5,684	6,821
0.591	424	637	849	1,061	1,273	1,485	1,698	1,910	2,122	2,546	2,971	3,183	3,820	4,244	5,305	6,366
0.630	398	597	796	995	1,194	1,393	1,592	1,790	1,989	2,387	2,785	2,984	3,581	3,979	4,974	5,968
0.669	374	562	749	969	1,123	1,311	1,498	1,685	1,872	2,247	2,621	2,809	3,370	3,745	4,681	5,617
0.709	354	531	707	884	1,061	1,238	1,415	1,592	1,768	2,122	2,476	2,653	3,183	3,537	4,421	5,305
0.748	335	503	670	838	1,005	1,173	1,340	1,508	1,675	2,010	2,345	2,513	3,016	3,351	4,188	5,026
0.787	318	477	637	796	955	1,114	1,273	1,432	1,592	1,910	2,228	2,387	2,865	3,183	3,979	4,775
0.827	303	455	606	758	909	1,061	1,213	1,364	1,516	1,819	2,122	2,274	2,728	3,032	9,789	4,547
0.866	289	434	579	723	868	1,013	1,157	1,302	1,447	1,736	2,026	2,170	2,604	2,894	3,617	4,341
0.906	277	415	554	692	830	969	1,107	1,246	1,384	1,661	1,938	2,076	2,491	2,768	3,460	4,152
0.945	265	398	531	663	796	928	1,061	1,194	1,326	1,592	1,857	1,989	2,387	2,653	3,316	3,979
0.984	255	382	509	637	764	891	1,019	1,146	1,273	1,528	1,783	1,910	2,292	2,546	3,183	3,820

Tool failure and trouble shooting

Troubles		Causes	Solution																
			Cutting conditions					Tool shape						Grade		etc			
			Cutting speed	Feed	Depth of cut	Coolant	Up cut·down cut	Relief angle	Lead angle	Length of flute	Number of flute	Honing	Chip pocket	Toughness	Hardness	Machine rigidity	Machine vibration	Workpiece fixing	Overhang
Damage at cutting edge	Excessive periphery cutting edge	Improper cutting condition	⬇	⬆		◉											⬆		
	Chipping	Improper cutting condition Generating built up edge Weak tool rigidity Improper grade		⬇			⬇	⬇				◉		⬆			⬇	⬆	⬇
	Fracture during operation	Improper cutting conditions Excessive cutting load Excessive overhang		⬇	⬇					⬇			⬆			⬆		⬆	⬇
Poor surface finish		Generating built-up edge	⬆	⬆		◉			⬆			◉							
		Chattering	⬇				⬇			⬇						⬆	⬇	⬆	⬇
		Poor straightness		⬇	⬇		⬆		⬆	⬇									⬇
Poor machining precision (Machined size, Perpendicularity)		Improper cutting conditions Improper tool shape	⬆	⬇			⬇			⬇	⬆					⬆	⬇		⬇
Bad chip evacuation		Excessive cutting volume Improper chip pocket Improper cutting conditions		⬇	⬇						⬇		⬆						

⬆ : Increase ⬇ : Decrease ● : use ◉ : Correct use

The shape of drills and the names

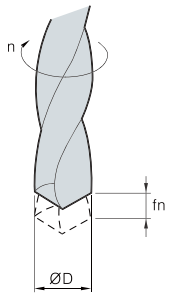


Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases. Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece(hardened steel) ◀ low - Helix angle - high ▶ Soft material(aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant. Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage.
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118. thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material(aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece(hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role . It depends on drill size. Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force. Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material(aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece(hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.0015~0.0394inch. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper.
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust.

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach drill(MSDA) Vulcan drill(VZDA)
S type		For wide use For general Easy regrinding	Solid drill(SSDA)

Major cutting formulas



Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (sfm)	$fn = \frac{vf}{n}$ (ipr)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{Id}{n \cdot fn}$ (min)
• vc : Cutting speed (sfm) • D : Drill diameter (inch) • n : Revolution per minute (min^{-1}) • π : Circular constant (3.14)	• fn : Feed per revolution (ipr) • vf : Feed per minute (ipm) • n : Revolution per minute (min^{-1})	• δ : Helix angle • D : Drill diameter (inch) • L : Lead (inch) • π : Circular constant (3.14)	• tc : Machining time (min) • n : Revolution per minute (min-1) • Id : Drilling time (inch) • fn : Feed (ipr)

Cutting torque and thrust(calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)(kg \cdot cm)$

$T = 57.95KDfn^{0.85}(kg)$

• Md : Cutting torque (kg·cm)
• T : Cutting thrust (kg)
• D : Drill diameter (inch)
• fn : Feed per revolution(ipr)
• K : Material coefficient

Workpiece material(SAE/AISI)		Tensile strength(kgf)	Hardness(HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 d^2 \cdot fn^m$

$T = K_2 d \cdot fn^n$

• Md : Cutting torque (kg·cm)
• T : Thrust (kg)
• fn : Feed (ipr)
• K1, K2, m, n : Experimental Data Characteristic value
• d : Drill diameter (inch)

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized Iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Troubles		Causes	Solution																
			Cutting conditions					Tool shape						Grade		etc			
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				●												
		• Built-up edge					●	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		●
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				●												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				●												
Chip		• Long chip	⬆	⬆			●				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				●												
Hole precision Burr, Poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		●
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				●	⬇	◉						⬆				
Fracture	Breakage on contact	• Poor surface finish			●	⬇												●	
		• Insufficient machine rigidity														⬆			●
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				●				⬇	●	
		• Chip clogging		⬇								⬆							

⬆ : Increase ⬇ : Decrease ● : use ◉ : Correct use

Hole size for threading

● Metric coarse screw threads

Specification			Hole diameter
M1	X	0.25	0.75
M1.1	X	0.25	0.85
M1.2	X	0.25	0.95
M1.4	X	0.3	1.1
M1.6	X	0.35	1.25
M1.7	X	0.35	1.35
M1.8	X	0.35	1.45
M2	X	0.4	1.6
M2.2	X	0.45	1.75
M2.3	X	0.4	1.9
M2.5	X	0.45	2.1
M2.6	X	0.45	2.2
M3	X	0.6	2.4
M3	X	0.5	2.5
M3.5	X	0.6	2.9
M4	X	0.75	3.25
M4	X	0.7	3.3
M4.5	X	0.75	3.8
M5	X	0.9	4.1
M5	X	0.8	4.2
M5.5	X	0.9	4.6
M6	X	1	5
M7	X	1	6
M8	X	1.25	6.8
M9	X	1.25	7.8
M10	X	1.5	8.5
M11	X	1.5	9.5
M12	X	1.75	10.3
M14	X	2	12
M16	X	2	14
M18	X	2.5	15.5
M20	X	2.5	17.5
M22	X	2.5	19.5
M24	X	3	21
M27	X	3	24
M30	X	3.5	26.5
M33	X	3.5	29.5
M36	X	4	32
M39	X	4	35
M42	X	4.5	37.5
M45	X	4.5	40.5
M48	X	5	43

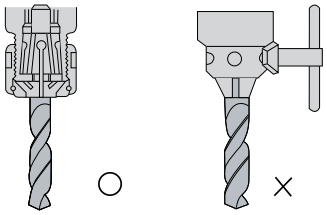
● Metric coarse screw threads

Specification			Hole diameter
M2.5	X	0.35	2.2
M3	X	0.35	2.7
M3.5	X	0.35	3.2
M4	X	0.5	3.5
M4.5	X	0.5	4
M5	X	0.5	4.5
M5.5	X	0.5	5
M6	X	0.75	5.3
M7	X	0.75	6.3
M8	X	1	7
M8	X	0.75	7.3
M9	X	1	8
M9	X	0.75	8.3
M10	X	1.25	8.8
M10	X	1	9
M10	X	0.75	9.3
M11	X	1	10
M11	X	0.75	10.3
M12	X	1.5	10.5
M12	X	1.25	10.8
M12	X	1	11
M14	X	1.5	12.5
M14	X	1	13
M15	X	1.5	13.5
M15	X	1	14
M16	X	1.5	14.5
M16	X	1	15
M17	X	1.5	15.5
M17	X	1	16
M18	X	2	16
M18	X	1.5	16.5
M18	X	1	17
M20	X	2	18
M20	X	1.5	18.5
M20	X	1	19
M22	X	2	20
M22	X	1.5	20.5
M22	X	1	21
M24	X	2	22
M24	X	1.5	22.5
M24	X	1	23
M25	X	2	23
M25	X	1.5	23.5
M25	X	1	24
M26	X	1.5	24.5
M27	X	2	25

Cautions

● Selection of drill chuck

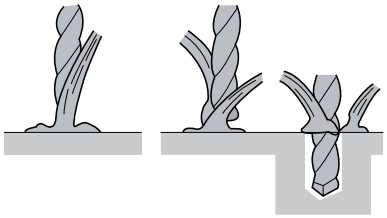
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

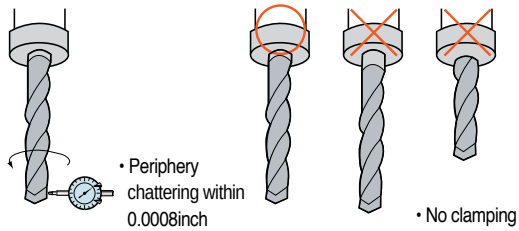
• Supply enough coolant around hole entrance.
• Standard cutting oil pressure : 3~5kg/㎠, Flux : 2~5l/min.



• Supply much coolant at hole entrance

● Mounting drill

• When mounting drill Periphery chattering should be within 0.0008inch
• Flute should not be clamped.

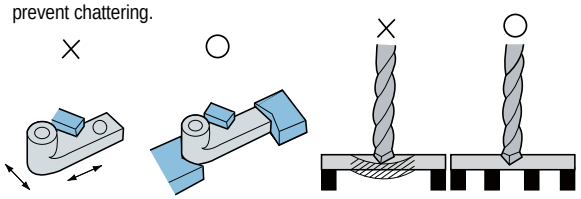


• Periphery chattering within 0.0008inch

• No clamping flute

● How to clamp workpiece

• At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering.



• Uniformed and strong clamping is needed (Right and left, up and down)

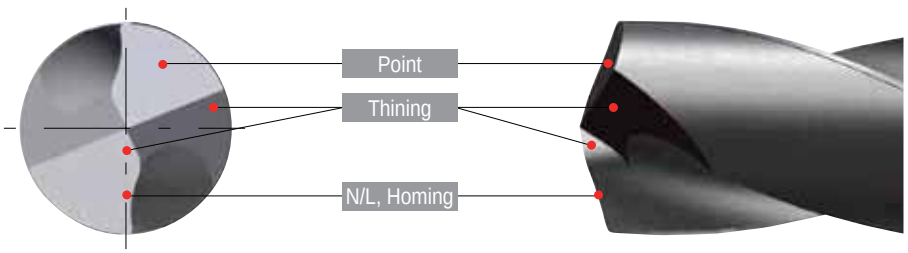
• Strong clamping is needed because bending causes chipping

Notice

1) For better drill's life, small damage and wear are favorable to be regrinding.
2) Damage and wear size should be within 0.06inch for regrinding.
3) If drill has crack, regrinding is impossible.
4) Ordering for regrinding is acceptable or purchase regrinding machine

Regrinding procedures

● Regrinding mathod (Mach Drill)

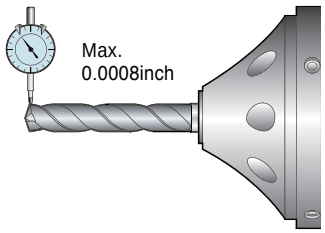


1) Preparation

- Determination of regrinding areas Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding.

2) Grinding operation

- Drills setting
Drill is clamped to collet chuck Chattering is kept within 0.0008inch.

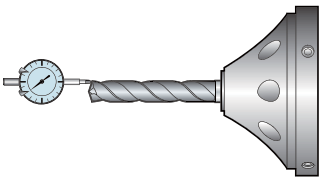


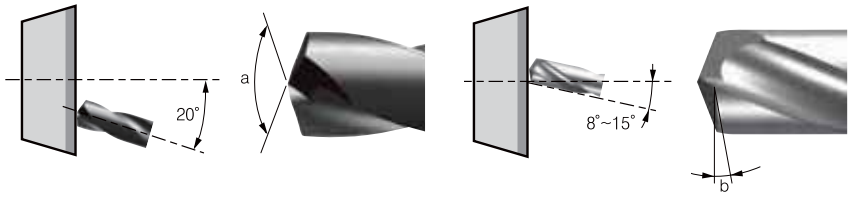
3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely.
- The difference of the lip height is kept within 0.0008inch.

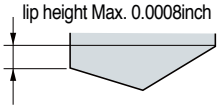
Point angle(a) : 140°

Point relief angle(b)t : 8°~ 15°





The difference of the lip height Max. 0.0008inch

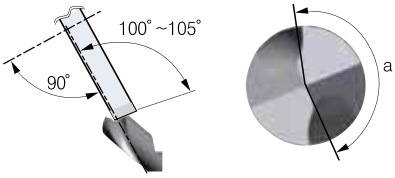


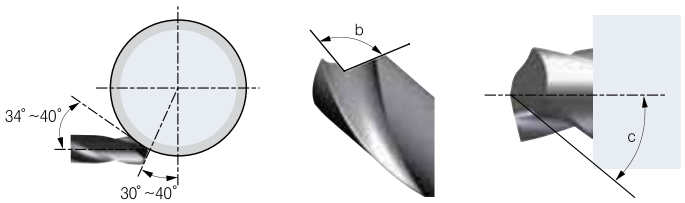
4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.0012 ~0.0032 for balancing.
- Set the wheel to tilt drill axis by 34°~ 40°.

Thinning angle(a)° : 155°~ 160°/ Thining open angle(b) : 100°~ 105°

Thinning relief angle(c) : 34°~ 40°

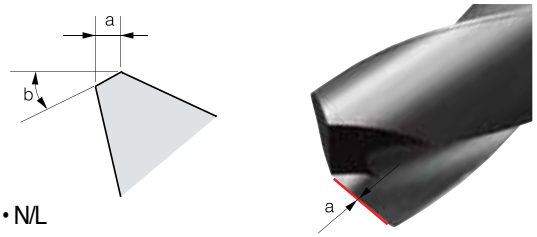




5) Grinding - N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge.
- After negaland operation Finishes with brush or handstone.

N/L width(a) : 0.0020 ~ 0.0063 / N/L angle(b) : 24°~26°

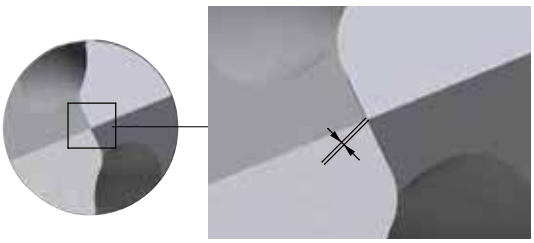


• N/L

● TIP

· Making point
- Without center drill, the point width should be below 0.004inch.

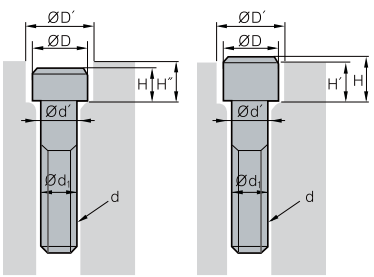
· Recommended grinding condition
- Diamond wheel : 240~400 mesh
- Diamond chisel : 400~600 mesh
- Diamond hand stone : 800~1500 mesh



Hexagonal socket bolt(Clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød₁	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	8.5	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32



The comparison of chip breakers

APPLICATION				KORLOY	KYOCERA	TAEGUTEC	SUMITOMO	SANDVIK	KENNAMETAL	ISCAR	WLATER	MITSUBISHI	SECO
NEGATIVE	P	Steel	Ultra-Finishing	- VL	DP (G) GP, PP	- FA	- FA, FL	- QF	FF(G) UF	- SF	- NF3	PK(G) FH,FS	- FF1
			Finishing	VF VB	HQ -	FG SF	LU, SU SE	PF 61	FN -	NF F3M	NF4 PF5	SH, C LP	FF2 -
			Medium to finishing	VQ, VC LP	CQ PQ	MC FC	SX -	- -	LF, CT -	TF -	NS6 MP3	SA, C() MV	MF2, MF3 MF5
			Medium machining	Gm, HM VM	HK, CS GS HS, PS -	MP, MT PC	GU, UX GE	QM, SM PM	MP, MN -	GN M3M	NM4, NP5 NM5,NM6	MA,MH MP	M3, M5 -
			Roughing	B25 HR, GR	PT,GT, HT, PH	RT	MU,ME, MX	- PR	- RN	- NR, R3M	- NM9, PP5	GH, RP	M5 MR5,MR6, MR7
			Heavy duty machining	GH VH VT	PX HX -	RH, RX HZ HT, HY	HG, MP HP HU,HW,HF	PR QR HR	RH RM MM	NM HR -	NR4, NRF NR8 -	HZ HV, HX, HAX HBS,HCS, HDS,HXD	R4,R5 R6, R7, R8 RR6, PR9, R56,R57,R68
		Low carbon steel	Soft steel	VL -	XF, XP, XP-T XQ, XS	SF -	FL -	LC -	- -	- -	- -	FY SY	- -
		High feed	High feed cutting	VW LW -	WP WQ -	WS WT -	LUW,SEW GUW -	WF,WL WM,WMX WR	FW MW RW	WF WG -	NF NM -	SW MW -	FF2, MF2 MF5, M3 R4,R7
		Application	Shaft (long bar)	SH KNUX-	CJ, ST KNMX-	FS, VF, FX KNUX-	HM -	K KNUX-71	- -	- -	- -	ES KNMX-19	UX -
	M	Stainless steel		VP2 VP3, HS MP, GS	MQ, GU HU, TK, MU MS	EA MP, EM ET	SU EX, GU MU, HM	MF MM MR	FP MP RP	F3P M3M R3M	NF4 NM4 NR4	LM MA, GM, MM RM	MF1 MF3 M5
	K	Cast iron		MP GR, VR -MA	C ZS -MA, GC	MT RT KT -MA	UZ UX, GZ -MA	KF KM KR	FN RP UN	TF GN -MA	NM, MK5 NM5, RK5 -MA, MK5	LK MA, MK GH, -MA, RK	M4 M5 MR7
	S	HRSA		VP1 VP2 VP3 MP	MQ TK MU MS	EA ML EM ET	EF UP, EG EX MU	- 23.SR Xcel-SM -	FS, LF MS MP RP	PF PP VL -	NF4 - NM4 NR4	FJ(G), LS MJ MS, MS GJ, RS	M1 MF1 MF4 MR4
	N	Aluminium		HA	AH	ML	UP (GX), AG	23	MS	PP	-	MJ	MF1
POSITIVE	P M K	Application	Finishing	VL VF	XP GP	FA -	LU FP, FC, SI	PF UF	UF -	- PF	PF PF, PF2	FV SV	FF1 F1
			Medium machining	HMP MP	XQ HQ,CK	FG PC	- SU, SC	PM UM	LF -	14 SM	- PF4,PF5	- MV	MF2 F2
			Roughing	C25		MT	MU	PR, UR	MF	-	PM5		M5
	M,S	Stainless steel For HRSA		VP1 VL	CF,GF,GQ MQ	FG SA	FC -	KF KM	LF MF	PF SM	PM PM5	FJ, LM AM, MM	F1 MF2
	K	Cast iron		MP C25	GK HQ	PC MT	MU C/B	UM KR	LF MF,UF	17 19	- C/B	C/B	M3 M5
	N	Aluminium		AK, AR	AH	FL	AW, AG	AL	HP	AS, AF	PM2	F	AL
		High precision bar turning (tolerance class G&E)		KF, KM	FSF,USF	GF, FF	FY, FX,FZ	UM	-GH	LF,RF,XL	-	F, SR, SS, SM	UX

KORLOY Grades

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
CVD	P	NC3010	P05-P15	For high speed turning of steel	●		●	●		●				TiN / Al_2O_3 / MT-TiCN
		NC3215 (New)	P10-P15	For high speed turning of general steel and forged steel	●									TiN / Al_2O_3 / MT-TiCN
		NC3220	P15-P25	For medium turning of steel	●		●	●		●				TiN / Al_2O_3 / MT-TiCN
		NC3225 (New)	P20-P25	For universal turning of general steel and forged steel	●		●	●		●				TiN / Al_2O_3 / MT-TiCN
		NC3120	P20-P25	For medium turning of steel	●		●	●		●				Al_2O_3 / TiC / MT-TiCN
		NC3030	P25-P35	For medium to rough turning of steel	●			●		●				TiN / Al_2O_3 / TiC / MT-TiCN
		NC5330	P30-P35	For multi-purpose machining of mild steel and forged steel	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NC500H	P25-P35	For heavy turning of steel	●					●				TiN / Al_2O_3 / MT-TiCN
		NC5340 (New)	P30-P35	For high / medium low speed milling of turning		●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	P30-P40	For high speed turning of steel		●			●		●			TiN / Al_2O_3 / MT-TiCN
		NC5350 (New)	P35-P45	For medium low / low speed milling of steel		●								TiN / Al_2O_3 / MT-TiCN
		NCM335	P35-P45	For rough and interrupted milling of steel and high speed milling of cast iron		●								TiN / Al_2O_3 / MT-TiCN
	K	NC6205	K01-K10	For high speed turning of gray cast iron and ductile cast iron	●			●						Al_2O_3 / MT-TiCN
		NC6210	K05-K15	For universal turning of gray cast iron and ductile cast iron	●		●	●		●				Al_2O_3 / MT-TiCN
		NC6215 (New)	K10-K20	For turning of gray cast iron and ductile cast iron	●		●	●		●				Al_2O_3 / MT-TiCN
		NC5330	K15-K25	For multi-purpose machining of cast iron at high speed	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
	M	NC9025	M25-M35	For STS turning	●									TiN / Al_2O_3 / MT-TiCN
		NC5330	M25-M35	For multi-purpose machining of STS	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	M25-M35	For high speed milling of STS		●				●	●			TiN / Al_2O_3 / MT-TiCN
		NCM335	M30-M40	For rough and interrupted milling of STS		●								TiN / Al_2O_3 / MT-TiCN
	S	NC5330	S15-S25	For multi-purpose and interrupted machining of heat-resistant alloy steel	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
PVD	P	PC230	P15-P30	For finish and medium turning of steel		●			●		●			TiAlN
		PC3500	P25-P35	For medium and rough milling of steel (1st recommended)		●	●	●	●		●			TiN / TiAlN
		PC3600	P20-P30	For universal milling of steel		●								★New TiAlN film (High hardness / Oxidation resistance)
		PC3545	P35-P45	For medium / rough milling of steel at high interruption		●								TiN / TiAlN
		PC5300	P30-P40	For medium / rough milling of steel	●	●	●	●	●	●	●			★New TiAlN film (High hardness / Oxidation resistance)

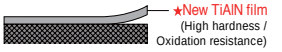
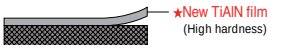
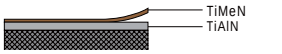
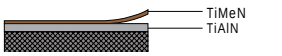
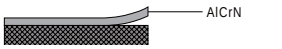
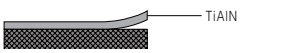
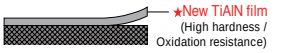
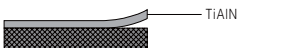
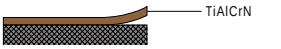
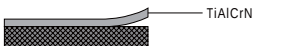
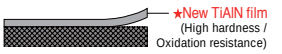
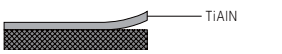
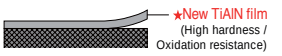
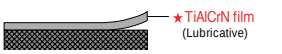
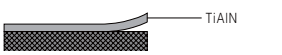
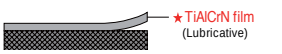
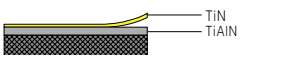
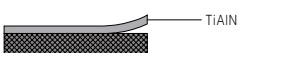
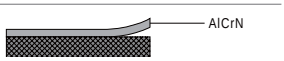
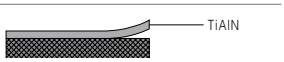
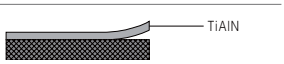
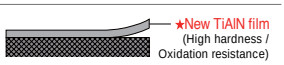
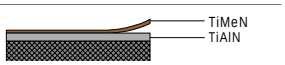
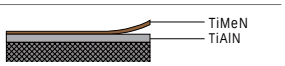
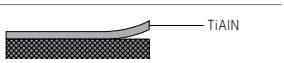
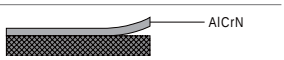
KORLOY Grades

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
PVD	P	PC5335 (New)	P30-P40	For medium / rough milling of steel	●	●					●			★TiAlCrN film (Lubricative)
		PC5400 (New)	P35-P45	For medium / rough milling of steel	●	●		●			●			★TiAlCrN film (Lubricative)
		PC2005 (New)	P01~P10	For milling of high hardness heat-treated steel		●								TiMeN TiAlN
		PC2010 (New)	P05~P15	For milling of pre hardened steel and press mold steel		●								TiMeN TiAlN
		PC2015 (New)	P10~P20	For milling of carbon steel and mold making		●								AlCrN
		PC210F	P10-P20	For high speed milling of general steel and alloy steel (Laser Mill)		●								★New TiAlN film (High hardness / Oxidation resistance)
		PC3030T	P20-P30	For steel threading					●					TiAlN
		PC203F	P05-P15	For high speed end milling of steel (H-max)									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC220	P20-P35	For universal end milling of steel (I-max)									●	★New TiAlN film (High hardness)
		PC303S (New)	P05~P15	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		PC310U (New)	P10~P20	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		PC315E (New)	P20~P35	For end milling of carbon steel and pre hardened steel									●	AlCrN
		PC320 (New)	P20~P35	For medium / rough end milling									●	TiAlN
		PC205F (New)	P20~P35	For general drilling Solid drill								●		TiAlN
		PC215G (New)	P15~P30	For general drilling Solid drill								●		TiAlN
		PC230F (New)	P25~P35	For general drilling Solid drill								●		TiAlN
		PC325U (New)	P20~P35	For general drilling Solid drill								●		TiAlCrN
		PC315G (New)	P15~P30	For general drilling Solid drill								●		TiAlCrN
	K	PC8110	K05-K15	For finish turning and milling of cast iron	●	●		●						★New TiAlN film (High hardness / Oxidation resistance)
		PC6510	K05-K15	For high speed milling of cast iron		●			●		●			TiN TiAlN
		PC5300	K20-K30	For medium-rough turning and milling of cast iron	●	●	●	●	●	●	●			★New TiAlN film (High hardness / Oxidation resistance)
		PC5335 (New)	K20-K30	For medium-rough turning and milling of cast iron	●	●					●			★TiAlCrN film (Lubricative)
		PC5400 (New)	K25-K35	For medium-rough turning and milling of cast iron	●	●			●		●			★TiAlCrN film (Lubricative)
		PC215K	K15-K30	For medium-rough milling of cast iron		●	●	●	●					★New TiAlN film (High hardness / Oxidation resistance)
		PC2005 (New)	K01~K10	For finish milling of cast iron		●								TiMeN TiAlN
		PC2015 (New)	K10~K20	For universal milling of cast iron		●								AlCrN

KORLOY Grades

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
PVD	K	PC203F	K05-K15	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC220	K20-K35	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness)
		PC303S (New)	K05~K15	For finish end milling of cast iron									●	TiMeN / TiAlN
		PC310U (New)	K10~K20	For medium / rough end milling of cast iron									●	TiMeN / TiAlN
		PC315E (New)	K20~K35	For universal end milling of cast iron									●	AlCrN
		PC320 (New)	K20~K35	For universal end milling of cast iron									●	TiAlN
		PC205F	K20-K35	For general drilling Solid drill								●		★New TiAlN film (High hardness / Oxidation resistance)
		PC215G (New)	K15~K30	For general drilling Solid drill								●		TiAlN
		PC325U (New)	K20~K35	For general drilling Solid drill								●		TiAlCrN
		PC315G (New)	K15~K30	For general drilling Solid drill								●		TiAlCrN
	M	PC8110	M10-M20	For medium to finish turning of STS	●			●		●				★New TiAlN film (High hardness / Oxidation resistance)
		PC9030	M25-M35	For medium to rough turning of STS at interruption	●		●	●		●				TiAlN
		PC5300	M20-M30	For medium to rough turning and milling of STS	●	●	●	●	●	●	●			★New TiAlN film (High hardness / Oxidation resistance)
		PC5335 (New)	M25-M35	For medium to rough turning and milling of STS	●	●					●			★ TiAlCrN film (Lubricative)
		PC9530	M25-M35	For medium to rough milling of STS at interruption		●					●			TiAlN
		PC5400 (New)	M30-M40	For medium to rough turning and milling of STS	●	●			●		●			★ TiAlCrN film (Lubricative)
		PC3545	M30-M40	For rough and highly interrupted milling of STS		●								TiN / TiAlN
		PC3030T	M20-M30	For STS threading					●					TiAlN
		PC2015 (New)	M10~M20	For universal milling of STS		●								AlCrN
		PC8105 (New)	M05~M15	For finish turning of STS	●			●						TiAlN
		PC8115 (New)	M15~M25	For medium to rough turning of STS	●			●						TiAlN
		PC210	M15-M25	For universal end milling of STS									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC303S (New)	M05~M15	For universal end milling of cast iron									●	TiMeN / TiAlN
		PC310U (New)	M10~M20	For universal end milling of cast iron									●	TiMeN / TiAlN
		PC325 (New)	M15~M25	For universal end milling of cast iron									●	TiAlN
		PC315E (New)	M20~M30	For universal end milling of cast iron									●	AlCrN

KORLOY Grades

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
PVD	K	PC203F	K05-K15	For high speed end milling of cast iron (H-max)									●	
		PC220	K20-K35	For high speed end milling of cast iron (H-max)									●	
		PC303S (New)	K05~K15	For finish end milling of cast iron									●	
		PC310U (New)	K10~K20	For medium / rough end milling of cast iron									●	
		PC315E (New)	K20~K35	For universal end milling of cast iron									●	
		PC320 (New)	K20~K35	For universal end milling of cast iron									●	
		PC205F	K20-K35	For general drilling Solid drill								●		
		PC215G (New)	K15~K30	For general drilling Solid drill								●		
		PC325U (New)	K20~K35	For general drilling Solid drill								●		
		PC315G (New)	K15~K30	For general drilling Solid drill								●		
	M	PC8110	M10-M20	For medium to finish turning of STS	●			●		●				
		PC9030	M25-M35	For medium to rough turning of STS at interruption	●		●	●		●				
		PC5300	M20-M30	For medium to rough turning and milling of STS	●	●	●	●	●	●	●			
		PC5335 (New)	M25-M35	For medium to rough turning and milling of STS	●	●					●			
		PC9530	M25-M35	For medium to rough milling of STS at interruption		●					●			
		PC5400 (New)	M30-M40	For medium to rough turning and milling of STS	●	●			●		●			
		PC3545	M30-M40	For rough and highly interrupted milling of STS		●								
		PC3030T	M20-M30	For STS threading					●					
		PC2015 (New)	M10~M20	For universal milling of STS		●								
		PC8105 (New)	M05~M15	For finish turning of STS	●			●						
		PC8115 (New)	M15~M25	For medium to rough turning of STS	●			●						
		PC210	M15-M25	For universal end milling of STS									●	
		PC303S (New)	M05~M15	For universal end milling of cast iron									●	
		PC310U (New)	M10~M20	For universal end milling of cast iron									●	
		PC325 (New)	M15~M25	For universal end milling of cast iron									●	
		PC315E (New)	M20~M30	For universal end milling of cast iron									●	

KORLOY Grades

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
Cermet	P	CN20	P15-P25	For general turning and milling of steel	●	●		●	●	●				
		CN2000	P10-P20	For medium to rough turning and milling of steel	●		●	●		●				
		CN2500 (New)	P15-P25	For highly interrupted machining at high feed	●		●	●						
		CN30	P20-P30	For rough milling of steel		●								
	K	CN1500 (New)	K05-K10	For high speed finishing of cast iron	●		●	●						
		CN2500 (New)	K10-K20	For high speed and interrupted machining of cast iron	●		●	●						
cBN	H	KB410	H01-H10	For high speed and continuous cutting of heat-treated steel	●									
		KB420	H05-H15	For highly efficient machining of heat-treated steel	●									
		KB425	H15-H25	For high speed and interrupted cutting of heat-treated steel	●									
		KB320	H15-H25	For continuous and interrupted cutting of heat-treated steel	●									
		KB335	H25-H35	For highly interrupted cutting of heat-treated steel	●									
		DNC100 (New)	H01-H10	For high speed and continuous cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC250	H05-H15	For high speed and continuous or low interrupted cutting of heat-treated steel	●									TiN / TiAlN
		DNC350	H15-H25	For medium to high interrupted cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC400 (New)	H25-H35	For medium interrupted and continuous cutting of heat-treated steel	●									TiN / TiAlN
	K	KB350	K01-K10	For finishing of high hardness cast	●									
		KB370	K05-K15	For high speed machining of cast iron	●	●								
PCD	N	DP90	N01-N10	For machining cemented carbide, ceramics, high Si-aluminum alloy, stone and rock	●									
		DP150	N05-N15	For machining high Si-aluminum alloy, copper alloy, rubber, wood and carbon	●									
		DP200	N10-N20	For precise machining of plastic, wood and aluminum	●									
DLC	N	PD1000	N01-N20	For turning of non ferrous metal(aluminum, etc.)	●									DLC
		PD2000	N01-N20	For milling of non ferrous metal(aluminum, etc.)		●								DLC
		PD3000	N01-N20	For end milling of non ferrous metal(aluminum, etc.)									●	DLC
Diamond coated	N	ND1000	N01-N20	For turning of non ferrous metal(graphite, aluminum, copper)	●									Dia Coating
		ND2000	N01-N20	For milling of non ferrous metal(graphite, aluminum, copper)		●								Dia Coating
		ND3000	N01-N20	For end milling of non ferrous metal(graphite, aluminum, copper)									●	Dia Coating

The comparison of grade for turning

WC

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	ST50 ST10 ST20 MA2 ST30 ST30A ST30N ST40	 ST10P ST20E A30 ST40E	 PW30	 IC50M IC54	 S1P SM30 S30T S6	 TTX TTM TTR	 K45 KM K420	 TX10S TX20 TX30 TX40	 STi10T STi20T UTi20T	SRN5 WS20B EX35 EX40 EX45	S1F VC6 VC5 VC56	 	 P10 P20 P30 P40	 	
	M	U10 U20 A40	U10E U2 A30 A40	 	 	 H13A H10F 	AT10 AT15 TTR	 K2885 K2S 	TU10 TU20 TU40	 UTi20T 	WAM10B EX35 	 VC27 VC28 	 	M10 M20 M40	 	
	K	H02 H01 H05 H10 G10	 H1 G10E	 KW10H	 IC4 IC20 IC28	 H1P H10F 	 THM THR 	 K68 K8735 	 TH03 TH10 KS20 	 HTi10T HTi20T 	 WH05 W10 WH20 	 VC3 VC2 VC1 	 	 K10 K20 K20M K30	 	

CVD Coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	NC3010 NC3215★ NC3220 NC3225★ NC3120 NC3030 NC500H NC5330	AC805P AC810P AC700G AC900G AC820P AC2000 AC830P	CA5505 CA510 CA515 VP5115 CA5515 CA525 VP5125 CA5525 CR9025 CA5535 CA530	 IC8150 IC8250 IC8350	GC4305 GC4205 GC4315 GC4215 GC4325 GC4225 GC4235	TP0500 TP0501 TP1500 TP1501 TGP25 T25M TP2500 TP2501 TGP35 T350M TP3500 TGP45	KCP05 KCP05B KCP10 KCP10B KCP25 KCP25B KCP30 KCP30B KCP40 KCP40B	T9105 T9115 T9125 T9135	UE6105 UE6110 MY5015 MC6025 UE6020 UE6035 UH6400	 HG8010 HG8025 GM8035	 VP5515 VP5525 VP5535	 WPP10S WKP13S WPP20S WKP23S WPP30S WKP33S	TT8105 TT8110 LC015P TT8115 TT8120 LC025P TT8125 TT5100 TT8135 TT7100	 CP5 	 JC110V JC215V JC325V JC450
	M	NC9020 NC9025	AC610M AC630M AC6030M	CA6515 CA6525	IC6015	GC2015 GC2025	TM2000 TM4000	KCM15 KCM15M KCM25 KCM25B KCM35 KCM35B	T6120 T6130	MC7015 MC7025 US7020 US735	 GM25 GX30	VP8515 VP8525	WAM10 WMP20S WAM20 WAM30	TT9215 TT9225 TT9235	 	
	K	NC6205 NC6210 NC6215★	AC405K AC415K AC420K	CA4505 CA4010 CA4515 CA4115 CA4120	 IC5005 IC5015	GC3205 GC3210 GC3215 GC3225	TK1001 TK2001 TGK1500	KCK05 KCK05B KCK15 KCK15B KCK20 KCK20B	T5105 T5115 T5125	MC5005 UC5105 MC5015 UC5115	 HG3505 HG3515	 VP1505 VP1510 VP1515	 WKK10S WKK20S WAK30	TT7005 TT7310 TT7015 TT6300	CP2 CP5	JC105V JC110V JC215V

PVD Coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	PC8110 PC230 PC5300 PC8115★ PC3545	 	PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660	IC507 IC808 IC830 IC908 IC3028 IC330	 GC1025 GC4125	CP200 CP250 CP500	KU10T KU25T 	AH710 GH730 AH330 AH740 AH120 GH330	 VP15TF VP20MF 	 IP2000 IP3000	VC907 VC927 VC905 	 WTA43 WTA41	 TT5030	 	 JC5003 JC5015
	M	PC8110 PC8115★ PC5300★ PC9030 PC5400★	AC510U EH510Z AC520U EH520Z AC530U	PR915 PR930 PR1125 PR630 PR660	IC808 IC907 IC3028 IC830 IC330	GC1005 GC1105 GC1020 GC1025 GC4125 GC2035	CP200 CP250 CP500	KC5010 KC5510 KC5025 KC5525	AH330 GH330 AH120 GH730 AH140 AH630 AH645	MP9005 VP10RT VP15TF VP20MF MP7035	IP50S IP100S	VC929 VC927 VC902 VC901 VC905	WSM10S WSM20S WSM30S WSM40S	 TT5030 TT8020	 ZM3 QM3 VM1 TAS	 JC5003 JC5015
	K	PC5300	EH510Z EH520Z		IC5100 IC810 IC220 IC908 IC228		CP200 CP250 CP500		AH110 GH110 AH120		CY110H	VC929 VC903 VC927 VC902 VC901 VC907		TT5030		
	S	PC8105 PC8110 PC8115★ PC5300 PC5400★	AC510U AC520U	PR915 PR660 PR1325	IC808 IC907 IC3028 IC328	GC1105 GC1025 GC2035	TS2000 CP500 TS2500	KC5010 KC5025	AH110 AH120	VP05RT VP10RT VP15TF MP7035			WSM10 WSM20 WSM30	TT5030		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	CC1500★ CN1500★ CC115★ CN2000 CN2500★ CN20	 T110A T2000Z★ T1500A T3000Z★	PV30★ TN30 PV7020★ TN60 TN620 TN6020 TN90 PV90★	 IC20N IC520N IC30N IC530N	 CT5015 CT525 GC1525★	CM C15M TP1020 TP1030★	 HT2 KT125 HT5 KT175 KT195M	 NS520 GT530★ NS530 NS9530 GT9530★ NS540 NS730	 NX2525 NX3035 UP35N★ AP25N★ NX335 MP3025★	 CH350 CZ25★ CH530 CH550 CH570	 VC83	 WTA43★ WTA41★	PV3010★ CT3000	 T3N T15 N20 C30 N40	 LN10 CX50 CX75 CX90 CX99
	M															
	K	CN1500★ CN2500★	T110A							NX2525				CT3000	 T15	 LN10 CX75

★ : PVD Coating cermet ★ : New Grade

The comparison of grade for milling

CVD Coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP100		IC5400	GC4210 GC4220 GC4230	MP1500 MP2500 MM4500	KCPM20 KCMP30 KC927M	T3130	FH7020 F7030		SM245	WKP25S WKP35S	TT8515 TT7800		
	M	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP400			GC2040	MP2500 MM4500		T3130	F7030						
	K	NC5330 NC5340★ NC5350★	ACK200		IC5100	GC3330 GC3040	MK1500 MK2000 MK3000	KC907M KCK15 KC914M KCPK30 KC917M KC924M	T1115 T1015	MC5020			WAK15 WKK25 WKP25S WKP35S	TT7515 TT6800		

PVD Coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	PC2005★ PC2010★ PC2015★ PC210F★ PC3600 PC3500 PC5300 PC5400★ PC3545	ACZ310 ACP200 ACZ330 ACP300 ACZ350	PR730 PR830 PR630 PR660	IC903 IC908 IC950 IC1008 IC928	P20A GC1010 GC1025 GC1030 GC1030	MP3000 F25M F30M F40M T60M	KC522M KUC20M KC525M KUC30M KC935M KC7140 KC720	GH330 AH120 AH3135	AP20M GP20M MP6120 VP15TF UP20M MP6130 VP30RT	ATH80D PCA08M ACS05E PCA12M PC20M JX1005 TB6005 JX1020 CY9020 TB6045 CY250 PTH30E JP4160 JM4160 PTH40H	VC935	WKP25 WKP35 WKP45	TT7070 TT7080 TT7030 TT8020	QM3 ZM3	JC5003 JC5015 JC5030 JC5040
	M	PC5300 PC9530 PC5400★ PC3545	ACM100 ACP200 ACM300 ACP300 ACZ350	PR730 PR1025 PR630 PR660 PR1535 PR660	IC903 IC900 IC250 IC928 IC328	GC1125 GC1025 GC2030 GC1030	F25M F30M F40M	KC5510 KC7020 KC522M KC725M KC735M KC7030 KC722	AH120 AH140 AH3135	MP7130 MP7140	JX1020 CY9020 JX1015 TB6020 CY250 JX1045 TB6045 JX1060 TB6060	VC928 VC902 VC901	WQM35 WSM35S WSP45 WSM45S	TT9030 TT9080 TT8020	QM3 ZM3	JC5003 JC5015 JC5030 JC5040
	K	PC8110★ PC6510 PC5300		PR510 PR905	DT7150 IC900 IC910 IC950 IC350		MK2050	KC510M KC915M KC520M	AH120	VP10MF VP15TF VP20RT		VC903 VC928 VC902 VC901		TT6290 TT6030 TT6060		JC5003 JC5015
	S	PC5300 PC5400★	AC520U	PR620 PR660 PR1535	IC328 IC408	GC1025 GC1040 S40T	F40M MS2050	KC510M KCU30M		VP15TF VP30RT MP9130	ACS05E		WSM35S WSM45S	TT9030 TT8020 TT8080		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	CN2000 CN20 CN30	T250A	TN100M TC60M	IC30N			KT195M	NS540 NS740	NX2525 NX4545	CH550 CH570			CT3000 CT7000	C50	
	M		T250A			CT530										
	K									NX2525						

★ : PVD Coating cermet ★ : New Grade

OLD-FASHIONED PRODUCT INFORMATION

Old-fashioned product information

M

OLD-FASHIONED PRODUCT INFORMATION

Grade

ISO material code		Old grade	New grade
Coating grade	P	NC310	NC3010
		NC320, NC3020, NC3120	NC3220
		NC330	NC3030
	M	PC3530,PC3525,PC3535,PC3500	PC3600
	K	NC305K, NC6105	NC6205
		NC6110	NC6205, NC6210
	S	PC8010	PC8110
	P, M, K, S	PC8520,PC215K	PC5300
		PC225F	PC205F
Cermet		CN1000	CN1500
		CT10, CN200	CN2000

- Korloy always study and develops cutting-edge technology tools and grades which covers higher speed and feed conditions
- Korloy guarantees better performance and wide stock-management range for the new grade

External holder

Designation	Insert	Old parts name						New holder	Page
		Lever	Screw	Shim	Shim pin	Wrench	Shim pin Wrench		
PCBNR□□□□-□19	CN□□1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCBNR□□□□-□19N	**B104**
PCBNR□□□□-□25	CN□□2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCBNR□□□□-□25N	
PCLNR□□□□-□19	CN□□1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCLNR□□□□-□19N	**B105**
PCLNR□□□□-□25	CN□□2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCLNR□□□□-□25N	
PSBNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSBNR□□□□-□19N	**B108**
PSBNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSBNR□□□□-□25N	
PSDNN□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSDNN□□□□-□19N	**B108**
PSDNN□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSDNN□□□□-□25N	
PSKNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSKNR□□□□-□19N	**B109**
PSKNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSKNR□□□□-□25N	
PSSNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSSNR□□□□-□19N	**B109**
PSSNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSSNR□□□□-□25N	

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Designation	Insert	Old parts name				New holder	Page
		Wedge clamp	Screw	Washer	Others		
WTENN□□-3□ (Old Type:MTEEN)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTEEN□□□□-□16	**B112**
WTJNR□□-3□ (Old Type:MTJNR)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTJNR□□□□-□16	**B112**
WTXNR□□-3□ (Old Type:MTXNR)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTXNR□□□□-□16	**B112**

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Fine tool

Designation	Insert		Old parts name		New holder	Page
			Screw	Wrench		
FTIH	FTIHA31	FTG08, FTT08, FTF08	PTKA02508	TW08P	NFTIHA	C52
	FTIHA43	FTG11, FTT11, FTF11	PTKA03510	TW15P		
	FTIHA55	FTG14, FTT14, FTF14	PTKA0412	TW15P		
	FTIHA63	FTG16, FTT16, FTF16	PTKA0512	TW20P		

- Old inserts and parts are not interchangeable with new fine tool
- Good performance and convenient use of new fine tool gives customer best quality of service

Threading tool

Designation	Insert		Old parts name						New holder	Page
			Clamp	Clamp screw	Shim	Screw	C-ring	Wrench		
ETH	ETH3**R	ECTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	HW20L,HW25L	ER(L)H-□	D31
	ETH4**R	ECTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		
ITH	ITH2**R	ICTR2***	CH5R3	CHX0513	ST32C1	FTKA02565	CR04	TW07P	IR(L)H-□	D32
	ITH3**R	ICTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	TW15P,HW20L,HW25L		
	ITH4**R	ICTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		

- Old inserts and parts are not interchangeable with threading holders
- Good performance and convenient use of new fine tool gives customer best quality of service

Mill-Max

Designation	Insert	Old parts name					New cutter	Page
		Locator	Wedge	Wedge screw	Locator screw	Wrench		
ADA4000	SD□□1203	LAS4R/L	WASR/L	WTX0817	LTX0512	TW25	ADN(ADNA)4000	E34
ADA5000	SD□□1504	LAS5R/L	WASR/L	WTX0817	LTX0512	TW25	ADN(ADNA)5000	E35
EPA4000	SP□□1203	LES4R/L LES4R1/L1(Ø3 ~ Ø4)	WESR/L	WTX0817 WTX0813((Ø80 ~ Ø100)	LTX0512	TW25	EPN(EPNA)4000	E40
EPA5000	SP□□1504	LES5R/L LES5R1/L1(Ø3 ~ Ø4)	WESR/L	WTX0817 WTX0813((Ø80 ~ Ø100)	LTX0512	TW25	EPN(EPNA)5000	E41
PPA4000	TP□□2204	LPT4R/L LPT4R1/L1(Ø3 ~ Ø4)	WESR/L	WTX0817 WTX0813((Ø80 ~ Ø100)	LTX0512	TW25	PPN(PPNA)4000	E43

- Parts are not interchangeable with new mill-max cutters
- Good performance and convenient use of new mill-max gives customer best quality of service

Cen-Mill

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
HEA	Ø25	MCMT080308EN ZCMT080308ER	FTNA0307	TW09P	AMSA□□□□M	E137~E138
	Ø32, 40, 50	MCMT09T308EN ZCMT09T308ER	FTNA0408	TW15P		
LE(LEA)	LOCX1205ZZ		FTNB0411	TW15P	AMCA□□□□M	E124~E126
SEA	Ø25	MPMT090308	FTNA0408	TW15L	AMSA□□□□MH	E139
	Ø32, 40	MPMT120408	FTNA0513	TW20L		
TM	MIT100 MET150,200,300,400		FTNA0408 FTNA0513(TM950)	TW15L TW20L(TM950)	TMS(I)	D49
PM	EDCW1604ZDF/TR		FTNA0513	TW20L	RM4Z	E83~E84
CEA (Code changed)	SPG(M)N1203□□				CEA45-□□□□R-S125 (New code)	E256~E258

- Old inserts and parts are not interchangeable with new milling product
- New product : Alpha mill which has unique alpha-curve edge guarantees wide range machining and good performance.
- Good performance and convenient use of new milling tool gives customer best quality of service

Jip Drill

Designation	Insert		Old parts name		New indexable drill	Page
			Screw	Wrench		
JDA	JD200	WCMT030208-C20	FTKA02565	TW07P	K□DA (KING DRILL)	G12~G20
	JD250	WCMT040208-C20				
	JD300	WCMT050308-C20	FTNA0307	TW09P		
	JD410	WCMT06T308-C20	FTGA03508			
	JD580	WCMT080408-C20	FTNA0408	TW15P		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service

LPD / SPD / NPD

Designation	Insert		Old parts name		New indexable drill	Page
			Screw	Wrench		
LPD	~ LPD135	LPMT040203-DF	FTNA0204	TW06P	K□DA (KING DRILL)	G12~G20
SPD	~ SPD155	SPM(E)T050203-DM, DF, DS, DA	FTNA0204	TW06P		
	~ SPD195	SPM(E)T060204-DM, DS, DR, DA	FTKA02206S	TW07S		
	~ SPD225	SPM(E)T070204-DM, DS, DR, DA	FTKA02565	TW07S		
NPD	~ NPD245	NPM(E)T222408-DM, DS, DR, DA	FTKA02565	TW07S		
	~ NPD285	NPM(E)T252808-DM, DS, DR, DA	FTKA0307	TW09S		
	~ NPD325	NPM(E)T293208-DM, DS, DR, DA	FTKA0307	TW09S		
	~ NPD405	NPM(E)T334008-DM, DS, DR, DA	FTKA03508	TW15S		
	~ NPD505	NPM(E)T415008-DM, DS, DR, DA	FTKA0410	TW15S		
	~ NPD605	NPM(E)T516012-DM, DS, DR, DA	FTNC04511	TW20S		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service

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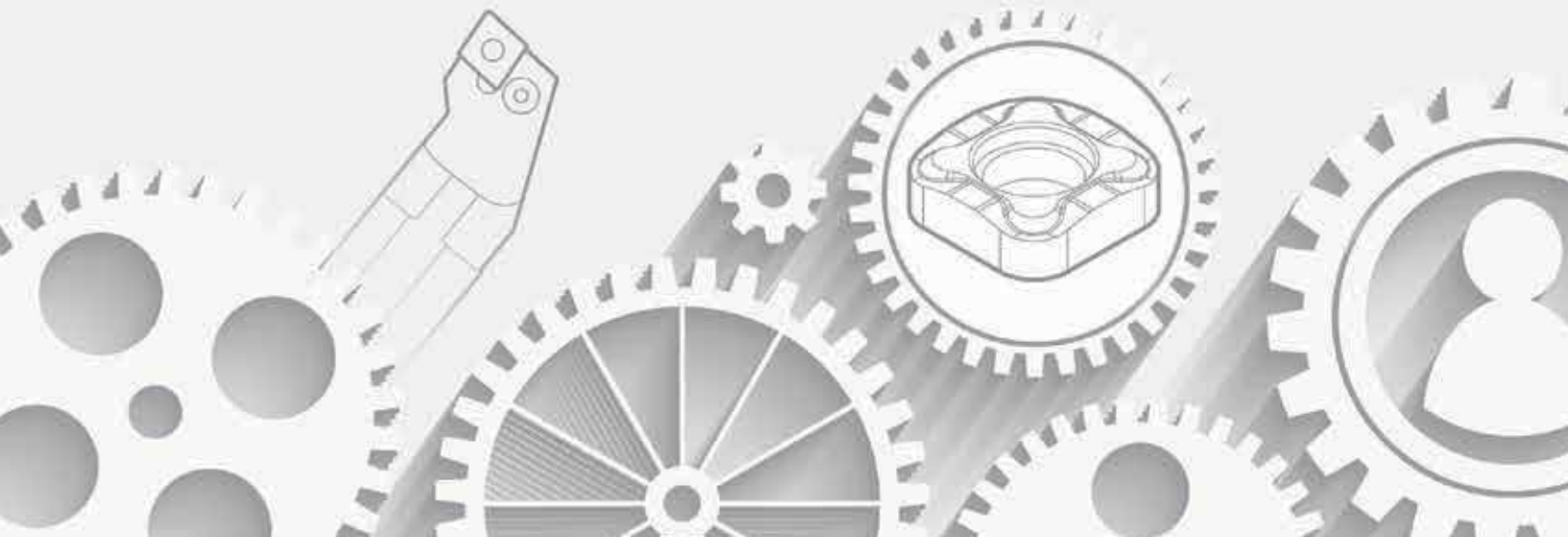

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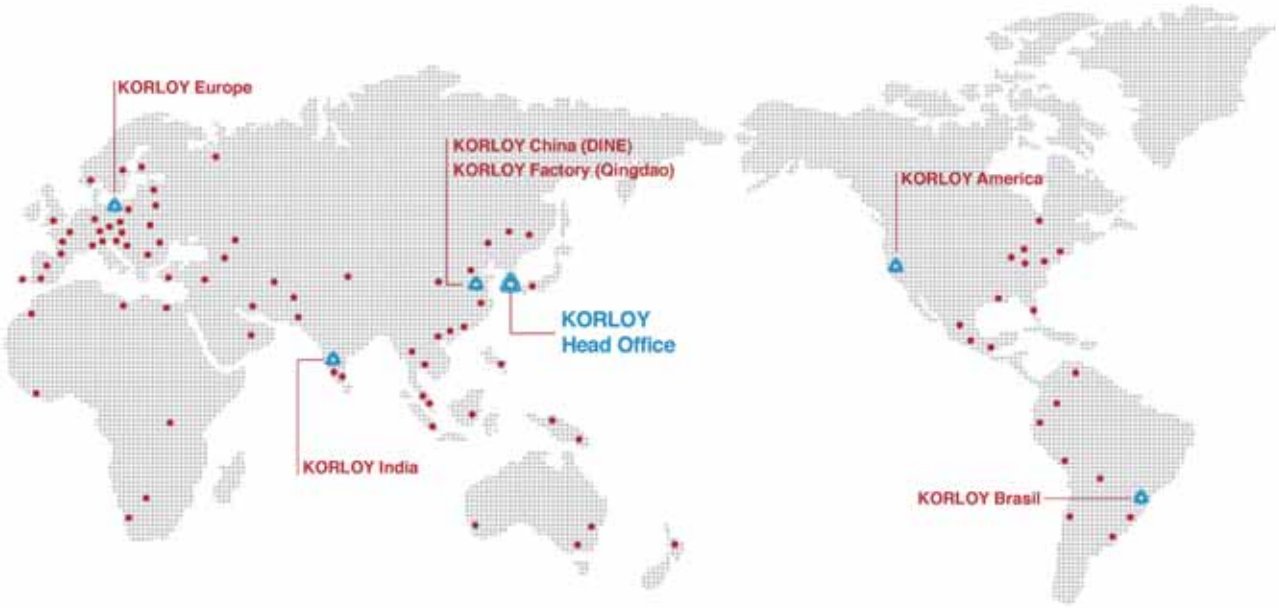
KORLOY Global Network

We stand to be the Global Top Manufacturer. Korea's Best. World's Best



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