THE NEW VALUE FRONTIER

KYOCERA

General Catalog

Contents

CERATIP®

See the Front Page of each Section for Details

⚠ CAUTION

Safety Notes of Cutting Tools

1. Introduction

Kyocera has put "caution" or "warning" label on the package of cutting tool product, but it is not put on the tool itself. The following information is provided to be read before the use of the tool so that the tool is handled properly and safely.

2. Basic Information of Cutting Tool Material

1) Technical Terms

Cutting Tool Material : General term of tool material, such as Cemented Carbide, Coated Carbide, Cermet, Coated Cermet, Ceramics, CBN and Diamond (PCD)

Carbide Material : Cemented Carbide with WC (Tungsten Carbide) as the main ingredient

2) Physical Property

Appearance : Depends on materials. (e.g. Gray, Black, Gold, etc.)

Smell : None

Hardness : Carbide and Cermet: 5 - 30GPaHV, Ceramics: 10 - 40GPaHV, CBN: 20 - 50GPaHV, Diamond: 80 - 120GPaHV

Sp. Gr. : Carbide: 9 - 16, Cermet : 5 - 9, Ceramics : 2 - 7, CBN/Diamond : 3 - 5

3) Composition

Carbide, Nitride, Carbo-nitride and Oxide with W, Ti, Al, Si, Ta, B, etc. and metals of Co, Ni, Cr, Mo, etc

3. Notes for Handling Cutting Tool Material

- These cutting tool materials are very hard but brittle at the same time and they may be broken by shocks or excessive clamp force.
- Carbide base material, especially, has large Specific Gravity and becomes heavy. Handle with care when transferring and storing it.
- When brazing the cutting tool material, braze it at proper temperature, or the tool may drop or be broken if the solder's temperature is too low or too high.

4. Notes for Using Cutting Tool

- The cutting edge is very sharp and wear gloves to touch the tool or install it to the machine to prevent injury.
- During the cutting operation, cutting tools may be broken due to some shock, excessive tool wear or wrong conditions. Use protection material such as safe guard, safety eyeglasses, and gloves to prevent injury.
- Depending on work material and cutting conditions, sparks or fire may be caused during the machining. Use protection material such as safe guard, safety eyeglasses and gloves.
- During the cutting operation, chips or a part of work with high temperature may come out. Use protection material such as safe guard and safety eyeglasses to prevent injury.

How to use this Catalog

- This is Kyocera CERATIP's general catalog.
- This catalog was made in August, 2003.
- Stock Condition Indication

  ● : Standard Stock
  R : Right Hand Only Available
  L : Left Hand Only Available
  ○ : Check Availability
  △ : Product of made-to-order
  None : No Stock

- The specification of Products in this catalog may be improved and changed without notice.
- According to the development of new grade or new geometry, the product lineup may be unified or integrated.
- Kyocera CERATIP keeps improving quality and producing safe product.
  For the use and handling of CERATIP products, refer to
  "Safety Notes of Cutting Tool" of previous page.

Insert Grades

5~24

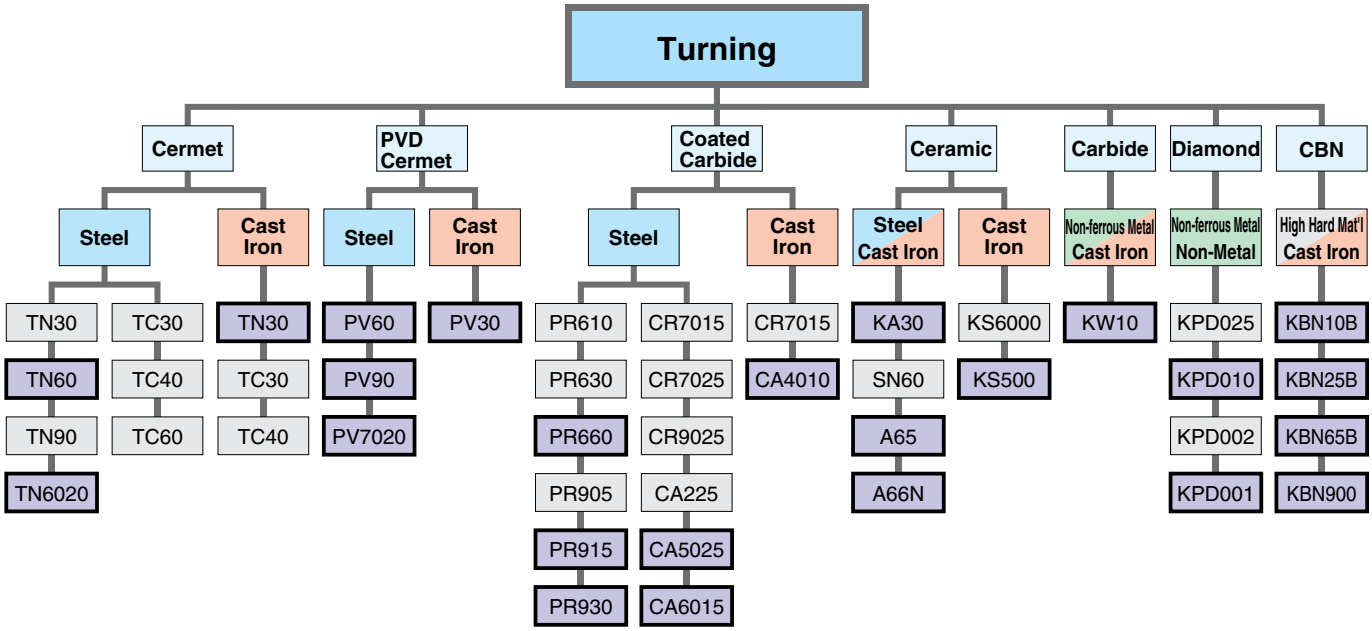
Insert Grades

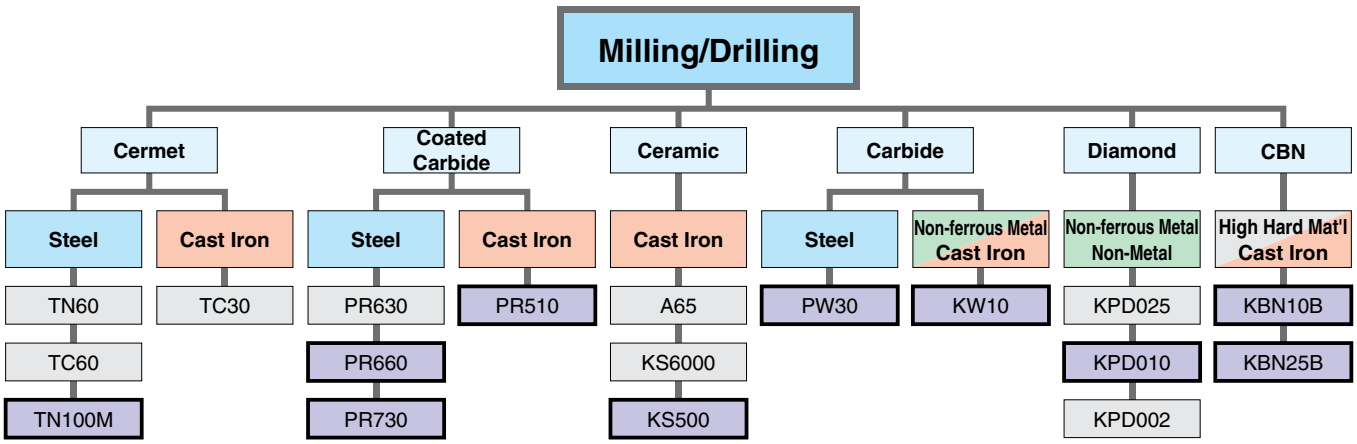
Summary of Insert Grades

Kyocera CERATIP Cutting Tools come in a wide variety of grades and designs in order to satisfy demanding metal removal needs.
Kyocera CERATIP provides top quality inserts such as Coated Carbide, Coated Micro-Grain Carbide, Carbide, PCD and CBN.

CERATIP Grades

Cermet	Excellent Surface Finish	➡ TN Series **TN30, TN60, TN90, TN100M** TC Series **TC30, TC40, TC60**
PVD Coated Cermet	Long Tool Life, Stable Machining	➡ PV Series **PV30, PV60, PV90**
Coated Carbide	Roughing Application. Stable Machining.	➡ CVD Coat CA Series **CA4010, CA5025, CA6010** CR Series **CR7015, CR7025** PVD Coat PR Series **PR630, PR660, PR730** **PR830, PR905**
PVD Coated Micro-grain Carbide	Precision Machining. Excellent Wear Resistance	➡ PVD Coat PR Series **PR915, PR930**
Ceramic	Low Cost Machining of Cast Iron and High Hard Material	➡ Aluminum Oxide **KA30** Aluminum Oxide + Zirconium **SN60** Aluminum Oxide + Titanium Carbide **A66N A65** Silicon Nitride **KS500 KS6000**
CBN	For High Hard Material and Cast Iron	➡ CBN **KBN10B, KBN25B, KBN65B, KBN900**
Diamond	For Non-ferrous Metal	➡ PCD **KPD001, KPD002, KPD010, KPD025**
Carbide	Roughing (ISO P-class) Non-ferrous (ISO K-class)	➡ Carbide **PW30, KW10**





Recommended Grade

Insert Grades

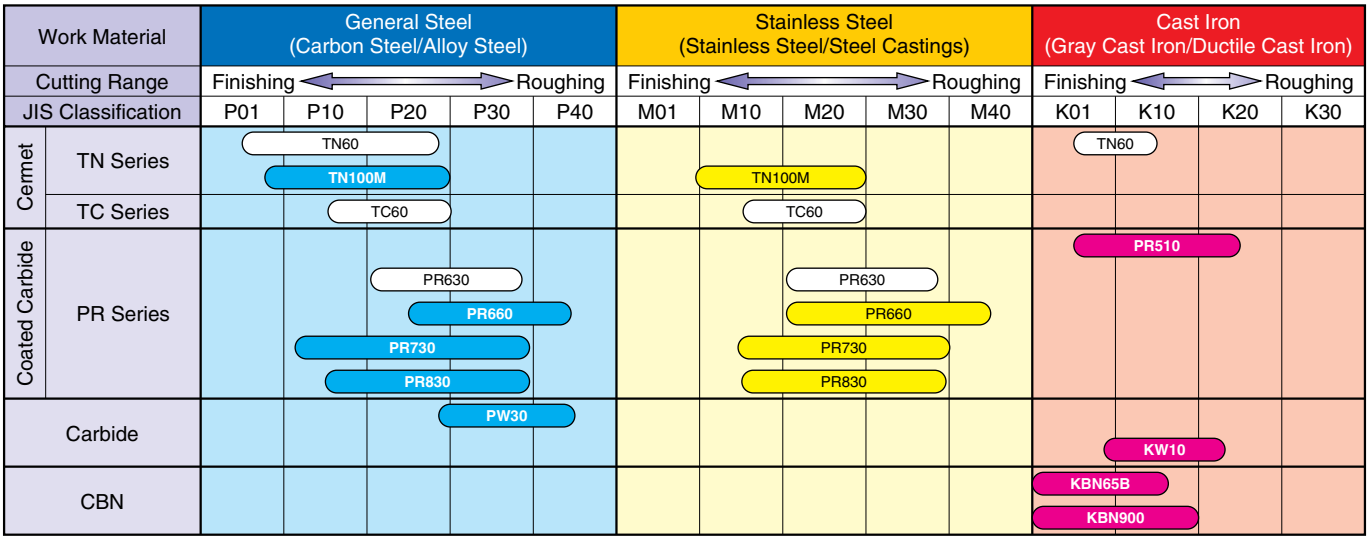
Summary of Insert Grades

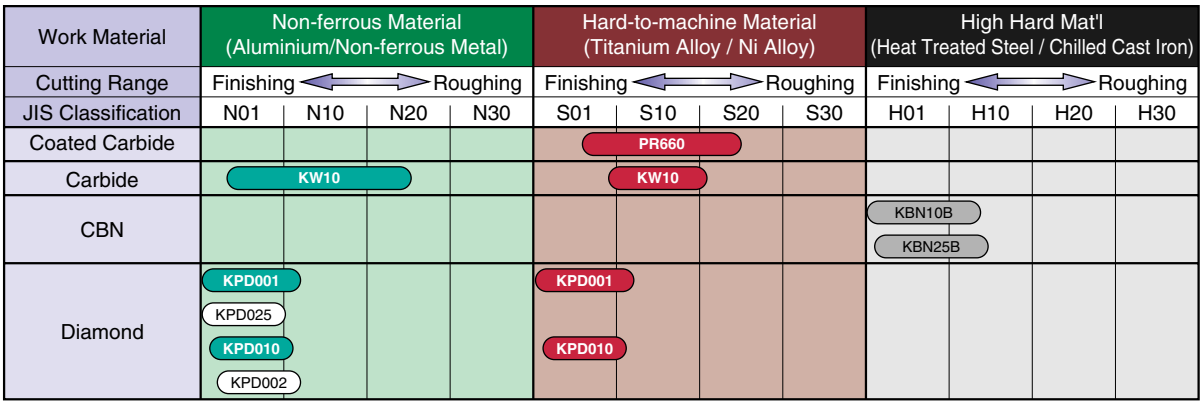
■ Turning

Work Material		General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range		Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Cermet	TN Series	TN30, TN60, TN90					TN60, TN90					TN30			
	TC Series	TC30, TC40		TC60				TC60				TC30, TC40			
	Micro Grain Cermet	TN6020					TN6020								
	PV Series	PV7020, PV30, PV60, PV90					PV7020, PV60, PV90					PV30			
Coated Carbide	CA Series	CA225, CA5025					CA6015					CA4010			
	CR Series	CR7015, CR7025, CR9025					CR7015, CR9025					CR7015			
	PR Series	PR905, PR915, PR930, PR630, PR660					PR905, PR915, PR930, PR630, PR660					PR610			
Ceramic												KA30, SN60, A65, A66N, KS500, KS6000			
Carbide												KW10			
CBN												KBN65B, KBN900			

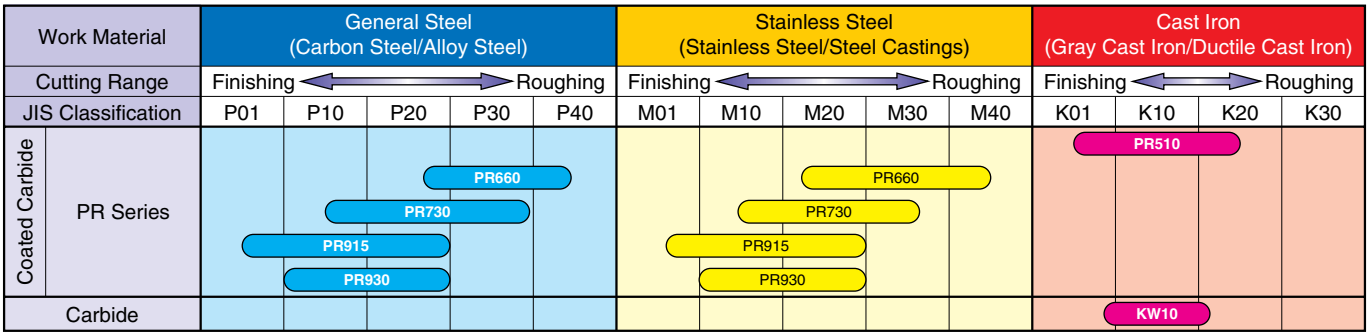
Work Material		Non-ferrous Material (Aluminium/Non-ferrous Metal)				Hard-to-machine Material (Titanium Alloy / Ni Alloy)				High Hard Mat'l (Heat Treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ⟷ Roughing				Finishing ⟷ Roughing				Finishing ⟷ Roughing			
JIS Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Coated Carbide	CA Series					CA6015							
	CR Series					CR7015							
Ceramic										A65, A66N			
Carbide			KW10				KW10						
CBN										KBN10B, KBN25B, KBN900			
Diamond		KPD001, KPD025, KPD010, KPD002				KPD001, KPD025, KPD010, KPD002							

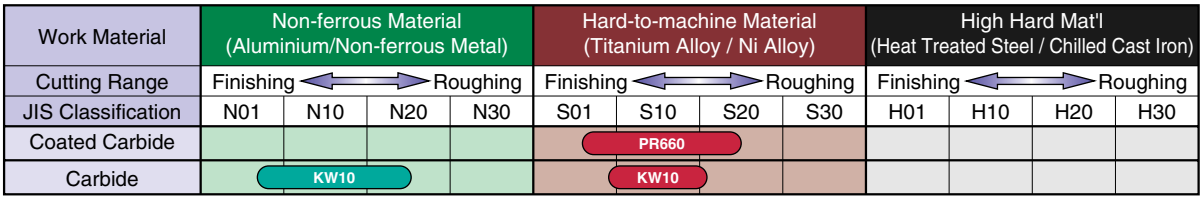
■ Milling





■ Drilling





Insert Grades
Cermet

● Cermet

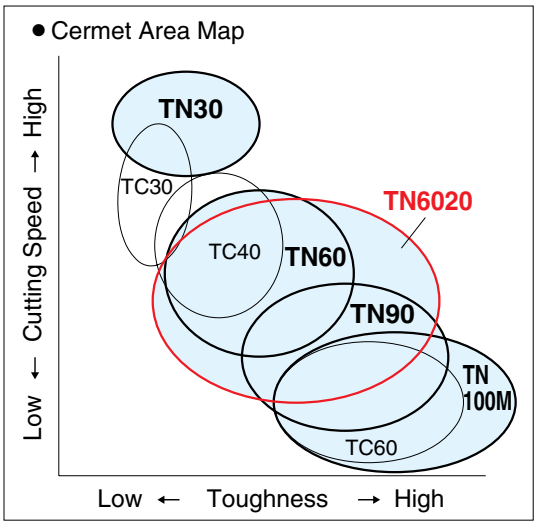
Kyocera is well known as "A leading company of Cermet". Kyocera CERATIP cutting tools' Cermet inserts come in a wide variety of grades and designs in order to satisfy demanding metal removal needs. Designed to provide long tool life and to afford excellent surface finishes, cermet cutting tools combine excellent toughness with superior wear resistance.

● Advantages

- Higher cutting speed is available due to good wear resistance. Long tool life.
- Excellent surface finish due to low affinity with workpiece.
- Stable machining on turning, milling, grooving and threading. Long tool life and high quality.

■ Kyocera's Cermet Lineup & Features

TN6020	TiCN base Super Micro-grain Cermet with high Nitrogen content. Available for both excellent wear resistance and toughness.
TN30	High speed machining of steel and cast iron when excellent surface finish and wear resistance is required.
TN60	Machining of steel, stainless steel, cast iron and non-ferrous metal where excellent surface finish and close size control is required. General purpose TiCN+NbC base Cermet.
TN90	Grooving and Cutting-Off of steels when excellent surface finish and close size control is required.
TN100M	For Milling of steel and stainless steel. TiCN+NbC base Cermet.
TC40	Excellent for Grooving and Threading. Stable machining is available.
TC60	For Milling, Grooving and Threading. Stable machining is available.

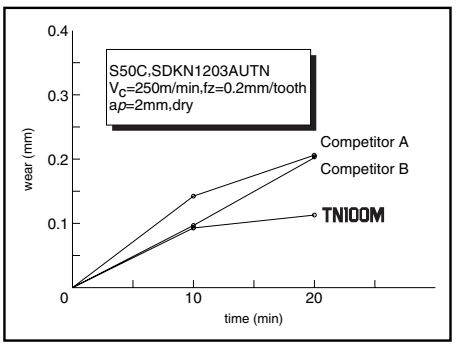


■ Application

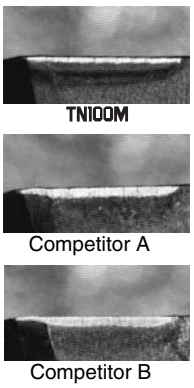
Work Material		General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range		Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning/Milling	TN Series	TN30	TN30									TN30			
			TN60	TN60				TN60							
				TN90				TN90							
				TN100M				TN100M							
	TC Series	TC30	TC30									TC30	TC30		
		TC40	TC40										TC40		
				TC60				TC60							
	Micro Grain Cermet	TN6020	TN6020				TN6020	TN6020							

■ Cutting Performance

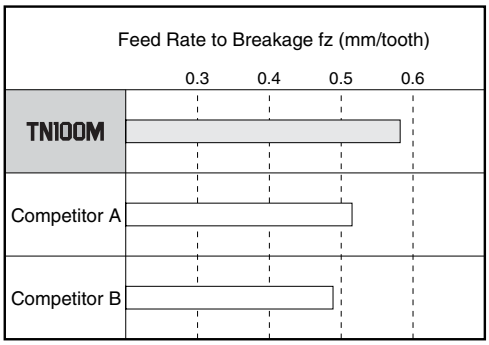
● TN100M Wear Resistance



Work Material: S50C SDKN1203AUTN
V_c=250m/min, a_p=2mm, fz=0.2mm/tooth, Dry



● TN100M Fracture Resistance



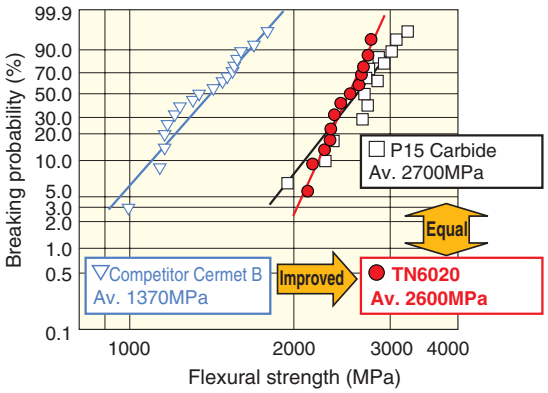
Work Material: SCM440(workpiece with grooves), SDKN1203AUTN
V_c=100m/min, a_p=2mm, Dry

The 4th Generation of Cermet, "TN series"

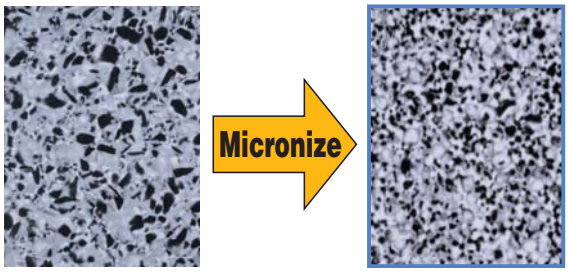
The 4th generation of Cermet, "TN series" are aiming at integration of Cermet Grades

- **TN6020**
  TiCN base Super Micro-grain Cermet with high Nitrogen content, TN6020's Flexural Strength is equal to carbide grades and TN6020 has greatly improved the reliability at wet cutting.
  TN6020 has good performance on chip control,suface finish quality and long tool life.
- **TN30**
  Cermet for high speed finifhing with wear resistance performance of Ceramic and toughness of Cermet.
  Cutting speed range V_C=300-500 m/min.
- **TN60**
  Cermet with high Nitrogen content.
  Features :
  1. Improvement of hardness and strength due to the restraint of hard particle's growth.
  2. Improvement of properties at high temperature by promoting solid solution of high melting point metals into the binder phase.
  3. Improvement of thermal shock resistance by improving thermal conductivity.

  Tn6020 integrates the Cermet grades of conventional "for Finishing","for General Purpose" and "for High Toughness", and performs just like coated carbide grades.
- **TN90**
  Integrated tough Cermet from general turning operation to cutting-off and Multi-function operations.
  Very good at fracture resistance and thermal shock resistance and available to wet cutting,too.
- **TN100M**
  Integrated Cermet for milling application with greatly improved thermal shock resistance.
  Good anti-Oxidation performance vestricts the oxidation wear and maintains excellent surface finish.



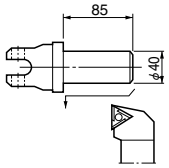
Super Micro Grain Cermet

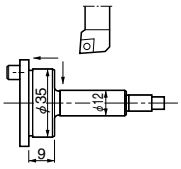


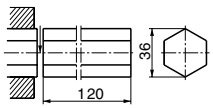
Conventional Cermet A
Av. grain size: 1.5～2.0 μm

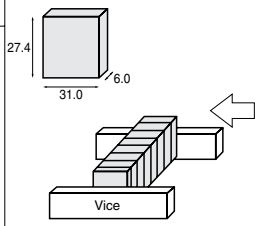
TN6020
Av. grain size: 0.6 μm

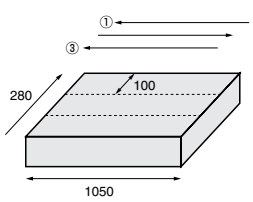
Cutting Data

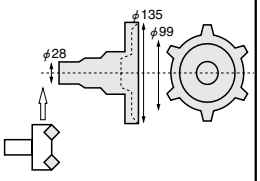
S50C		
Sleeve		
• V_C=260m/min • a*p*=1.5mm • f=0.25mm/rev • Dry • TNGG160408R-C		
TN30	260 pcs/corner	
Conventional Cermet	100 pcs/corner	

SCM415		
Crank Shaft		
• V_C=180m/min • a*p*=0.5mm • f=0.31mm/rev • Wet • CNMG120408HS		
TN60	300 pcs/corner	
Conventional Coated C	100 pcs/corner	

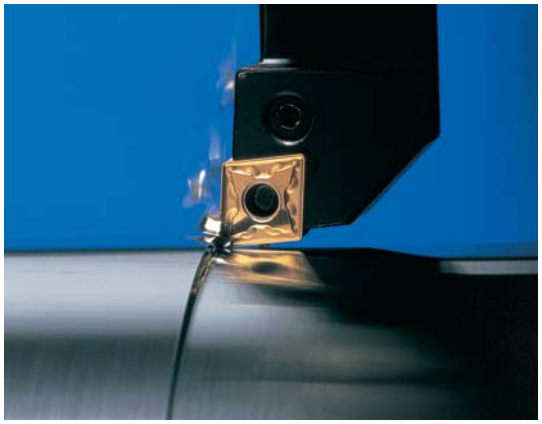
S45C		
Cartridge		
• V_C=120m/min • a*p*=0.1mm/rev • Wet • Cutting Off • TKN3		
TN90	300 pcs/corner	
Competitor Cermet E	200 pcs/corner	

SKD11		
Knitter Parts		
• V_C=163m/min • a*p*=1 or 2mm • fz=0.12mm/tooth • Dry • SDKN1203AUTN • 6 teeth		
TN100M	More than 1100 pcs	
Competitor Cermet E	500 pcs	

SKD61		
Cylinder Liner Mold		
• V_C=100m/min • a*p*=3mm • fz=0.15mm/tooth • Dry • SEKN1203AFTN • 6 teeth		
TN100M	More than 13m	
Competitor Cermet A	6m	

S50C		
Differential Gear Parts		
• V_C=63～95m/min • a*p*=4～6mm • fz=0.07～0.08mm/tooth • Wet • SDKN1203AUTN • 8 teeth		
TN100M	259 pcs	
Competitor Cermet C	40 pcs	

Insert Grades
PVD Coated Cermet



● PVD Coated Cermet

Kyocera's PVD coated cermet has features of both Cermet and Coated Carbide. Easy to use as Coated Carbide and good surface finishing, excellently efficient machining as Cermet are available.

● Advantages

- Wide range of machining from middle to finishing.
- Stabler machining with coolant than conventional Cermets.
- Long Tool Life and Stable Machining is available due to the combination with special TiN coat layer and tough substrate of Cermet.

■ Kyocera's PVD Coated Cermet Lineup & Features

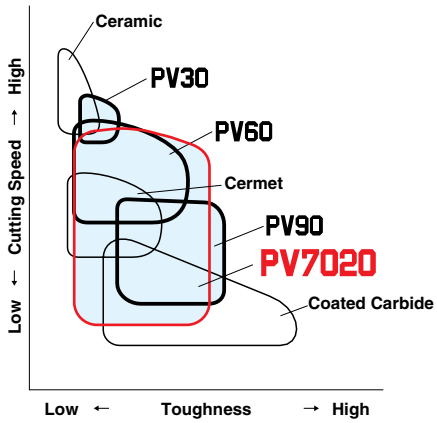
PV7020 Fine Surface PVD Coated Cermet for higher performance of Super Micro-Grain Cermet.
Greatly improved wear resistance at high speed machining.

PV30 High reliability, good stability and built up edge resistance for high speed machining of cast iron and steel

PV60 Cermet for high efficiency, high quality machining of near net materials

PV90 Excellent performance for roughing to finishing of steels. Reliable cutting with coolant. Use when tougher grade than conventional cermet is needed.

● PVD Coated Cermet Area Map

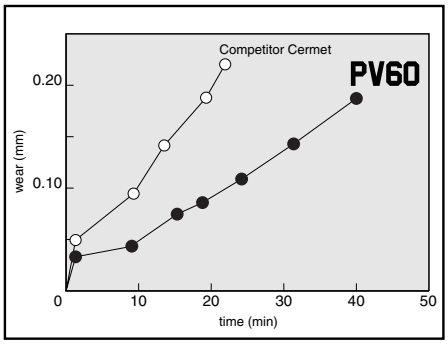


■ Application

Work Material	General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range	Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning – PV Series	PV7020, PV30, PV60, PV90					PV7020, PV60, PV90					PV30			

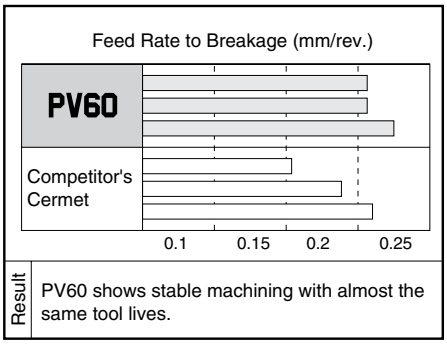
■ Cutting Performance

● PV60 Wear Resistance



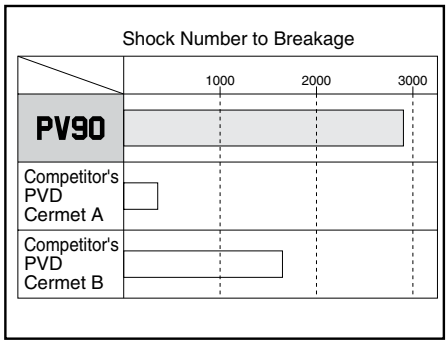
Work Material: SCM435 CNMG120408HS
V_c=200m/min, ap=2.0mm, f=0.3mm/rev, Dry

● PV60 Fracture Resistance



Work Material: SCM440(workpiece with grooves), CNMG120408HS
V_c=200m/min, ap=2.0mm, Dry

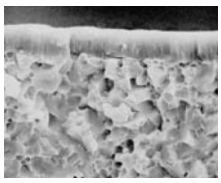
● PV90 Shock Resistance of Wet condition



Work Material: S45C(workpiece with grooves), CNMG120408HS
V_c=200m/min, ap=2.0mm, f=0.2mm/rev, Wet

■ PVD Coated Super Micro-Grain Cermet aiming at Total Cost Cut : PV7020

Fine Surface PVD Coated Cermet for enhancing performance of Super Micro-grain Cermet. Greatly improved wear resistance at high speed machining.
Triple Crown of Chip Control, Finished Surface's Quality and Long tool Life by the combination with diversified chipbreakers.



- TiN Coat
- FS Coat (TiAlN)
  For high cutting speed and high wear resistance
- Super micro grain cermet Substrate
  · High wear resistance
  · High Toughness
  · Super micro grain structure

FS Coat (TiAlN)

Newly developed TiAlN PVD coat brings stability and smooth machining

■ PVD Coated Cermet for Finishing : PV30

Long tool life and stability at high speed finishing of cast iron, free cutting steel and general steels.
Combination of long tool life of Ceramic tool, and easy handling and reliability of coated carbide tool.

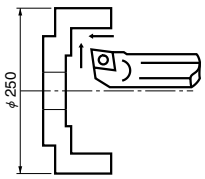
■ PVD Coated Cermet of Productivity Improvement : PV60

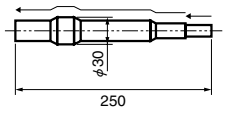
Integrated PVD Coated Cermet for high speed cutting and dry cutting.
Wide cutting range from roughing to high speed finishing.
Good balance between wear resistance and fracture resistance.
Suitable for medium to finishing of steels.

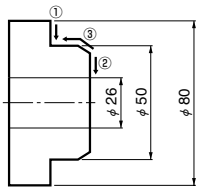
■ PVD Coated Cermet for Stable Machining and Long Life : PV90

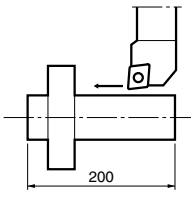
Excellent performance for roughing to finishing.
Stable wet roughing is available due to thermal shock resistance improvement.
Easy handling and reliability.
Stable machining and long tool life at wet cutting under the condition of d x f = Max. 0.6.
Suitable for forged part, soft steel machining.

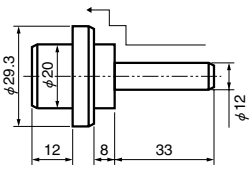
■ Cutting Data

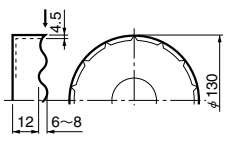
FC250	Brake Drum	● V_C=180m/min ● a_p=1.5mm ● f=0.2mm/rev ● CNMA120408	
PV30	400 pcs/corner		
Competitor's Coated E	280 pcs/corner		

SCM420	Shaft	● V_C=270～290m/min ● a_p=0.25～0.35mm ● f=0.25～0.35mm/rev ● Wet ● TNMG160402GP	
PV60	200 pcs/corner		
Competitor's Carbide	40 pcs/corner		

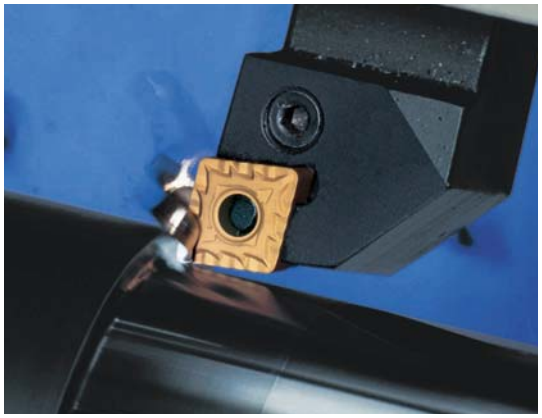
S45C (Hot Forged Steel)	Gear	● V_C=196～603m/min (N=2400min^{-1}) ● a_p=1.0mm ● f=0.25mm/rev ● Wet ● CNMG120408HQ	
PV90	420 pcs/corner		
Competitor's Coated A	200 pcs/corner		

FCD50	Shaft	● V_C=150m/min ● a_p=1.0mm ● f=0.2mm/rev ● CNMG120408	
PV30	800 pcs/corner		
Competitor's Coated F	450 pcs/corner		

S45C	Shaft	● V_C=120m/min ● a_p=0.5mm ● f=0.1mm/rev ● Wet ● TNMG160408HS	
PV60	300 pcs/corner		
Competitor's Cermet	200 pcs/corner		

SPHE (Hot-roled Sheet Steel)	End Plate	● V_C=370m/min ● a_p=2.5～5.0mm ● f=0.08mm/rev ● Wet ● CNMG120408HT	
PV90	250 pcs/corner		
Competitor's Coated D	150 pcs/corner		

Insert Grades
CVD Coated Carbide



● CVD Coated Carbide

Kyocera CERATIP's CVD coated carbide grades utilize the Ceramic's thin film coating technology and provide stable and efficient machining, covering from high speed machining to heavy interrupted machining.

● Advantages

- Available for the machining from low to high speed and finishing to roughing.
- Stable machining is obtained due to high toughness and crack resistance.
- Possible to reduce machining time with good chip control by various molded chipbreakers.

■ Kyocera's CVD Coated Carbide Lineup & Features

CA4010 Plastic deformation resistance, oxidation wear prevention at high speed cutting.

CA5025 Wide machining range for steel.
Special coating layers of TiCN and α-Al_2O_3.

CA6015 Newly developed columnar TiCN layer for machining stainless steel.

CR7015 For high speed machining of steel and interrupted cutting of gray cast iron/ductile cast iron.

CR7025 For general purpose of steel machining.
Coated grade of TiCN layer and special substrate.

CR9025 Cutting off, grooving and multi-function machining.
TiCN coating.

CA225 Al_2O_3 base coating for general purpose.

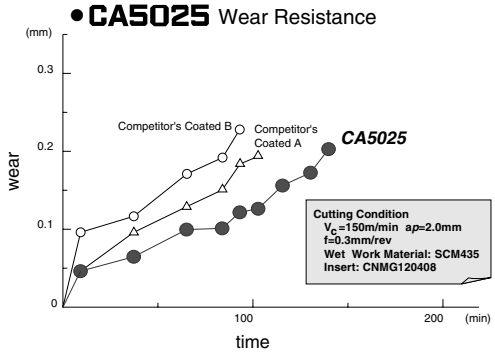
■ Application

Work Material		General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range		Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning	CA Series		CA225 / CA5025				CA6015					CA4010			
	CR Series		CR7015 / CR7025 / CR9025				CR7015 / CR9025					CR7015			

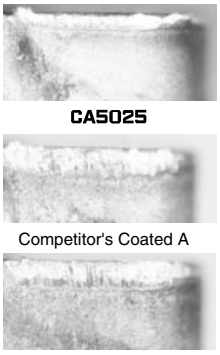
Work Material		Non-ferrous Material (Aluminium/Non-ferrous Metal)				Hard-to-machine Material (Titanium Alloy / Ni Alloy)				High Hard Mat'l (Heat Treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ⟷ Roughing				Finishing ⟷ Roughing				Finishing ⟷ Roughing			
JIS Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning	CA Series					CA6015							
	CR Series					CR7015							

■ Cutting Performance

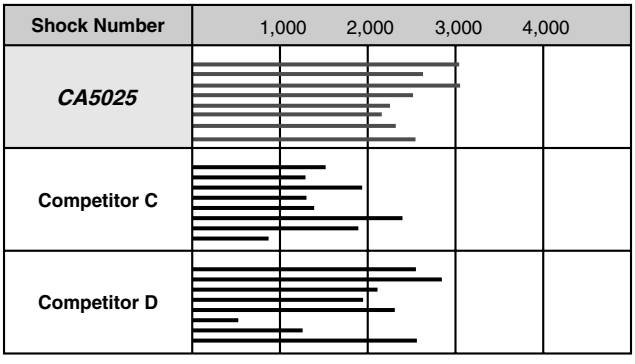
● CA5025 Wear Resistance



· Wear after 90 min. machining



● CA5025 Shock Resistance



(Work Material: SCM440 (workpiece with grooves), CNMG120408CS
V_c=200m/min. ap=1.5mm f=0.4mm/rev. Wet)

■ New CA series for the 21st Century

New CA series were developed for wide range of application such as steel, cast iron and stainless steel.

Features of Coating

- Improved wear resistance due to Combination of layers of α-Al_2O_3 and TiCN
- Strong edge due to specific non-crack coating technology

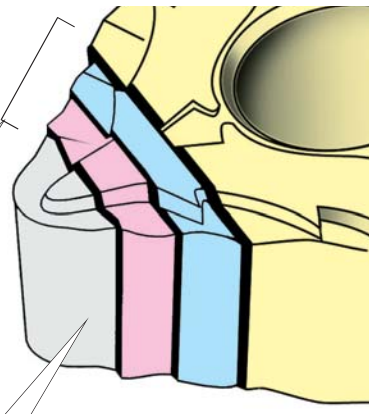
→ Long tool life and Stable machining under high cutting speed

Features of substrate

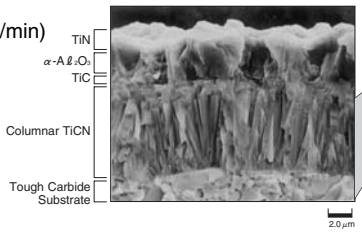
- Improved toughness by optimal dispersion of hard particles.
- Improved plastic deformation resistance and welding resistance in high cutting speed operation

→ High productivity with high feed rate

- **CA4010**
  covers the range of normal to interrupted machining
- **CA5025**
  covers middle to rough machining of steel
- **CA6015**
  is suitable for machining stainless steel (150～200m/min)

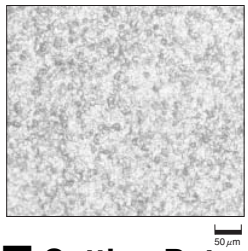


Microstructure

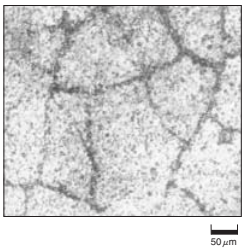


Crack resistance improvement due to specific crack prevention in the coat film

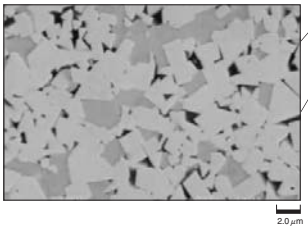
CA5025



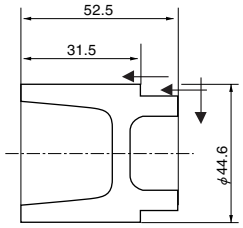
Conventional coating

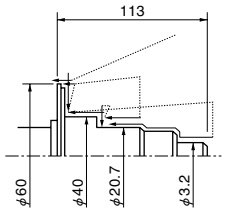


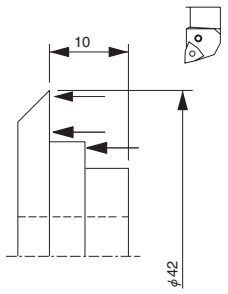
Microstructure of substrate

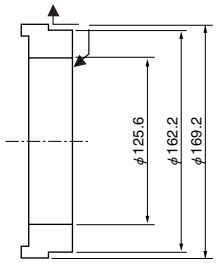


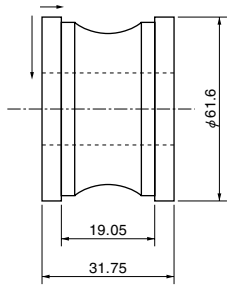
■ Cutting Data

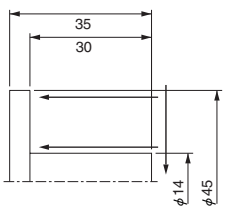
FC200		
Piston Disk		
• V_C=140m/min • a_p=1.8～2.1mm • f=0.03～0.35mm/rev • Wet • WNMG080412		
CA4010	2300 pcs/corner	
Competitor's Coated B	1200 pcs/corner	

SCM420H		
Input Shaft		
• V_C=200～250m/min • a_p=1.5～3.0mm • f=0.15～0.32mm/rev • Wet • WNMG080408CS		
CA5025	300 pcs/corner	
Competitor's Coated D	200 pcs/corner	

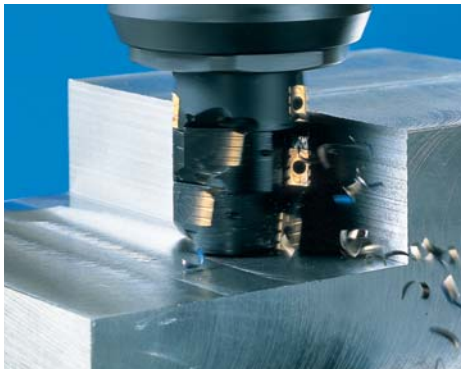
SUS403		
Valve		
• V_C=170m/min • a_p=1.0mm • f=0.25mm/rev • Wet • WNMG08048SU		
CA6015	300 pcs/corner	
Competitor's Coated A	250 pcs/corner	

FC250		
Ring		
• V_C=200m/min • a_p=1.5～5mm • f=0.3mm/rev • Wet • WNMG080408		
CA4010	120 pcs/corner	
Competitor's Coated E	90 pcs/corner	

SCM440H		
Worm Gear		
• V_C=230m/min • a_p=1.0～2.0mm • f=0.3～0.35mm/rev • Wet • WNMG080408CS		
CA5025	600 pcs/corner	
Competitor's Coated C	400 pcs/corner	

SUS316		
Tube Connector		
• V_C=150m/min • a_p=1.0mm • f=0.25mm/rev • Wet • CNMG120408SU		
CA6015	24 pcs/corner	
Competitor's Coated C	12 pcs/corner	

Insert Grades
PVD Coated Carbide



● PVD Coated Carbide

Kyocera CERATIP's PVD Coated Carbides are based on the Ceramic's thin film technology, and are good for milling, threading, grooving and stainless steel cutting. Very tough carbide substrate and the original coating technology realize excellent wear resistance and strong coat film adhesion for long tool life and stable machining.

● Advantages

- Good for low to high speed, finishing to heavy machining.
- Stable machining with high toughness.
- Special TiN base coating provides good surface finishing and high precision machining.

■ Kyocera's PVD Coated Carbide Lineup & Features

PR510 Milling of Gray cast iron/Ductile cast iron. TiCN+TiN multi coating.

PR610 Turning of Free steel, Gray cast iron/Ductile cast iron. TiN coating.

PR630 General purpose for Milling of steel, threading and grooving. TiCN coating.

PR660 For stainless steel. TiN coating.

PR730 For machining of mold. Long tool life with special TiAlN coating

PR830 For machining of mold with high cutting speed. Newly developed TiAlN - FS(Fine Surface) coating.

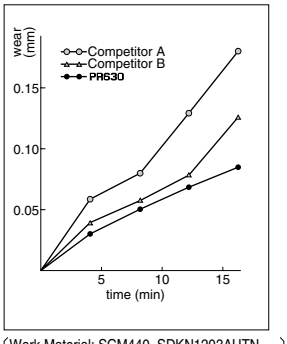
■ Application

Work Material	General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range	Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning/Milling/Drilling PR Series			PR630					PR630			PR510			
			PR660					PR660						
			PR730					PR730						
			PR830					PR830						

Work Material	Non-ferrous Material (Aluminium/Non-ferrous Metal)				Hard-to-machine Material (Titanium Alloy / Ni Alloy)				High Hard Mat'l (Heat Treated Steel / Chilled Cast Iron)			
Cutting Range	Finishing ⟷ Roughing				Finishing ⟷ Roughing				Finishing ⟷ Roughing			
JIS Classification	N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning Milling Drilling PR Series						PR660						

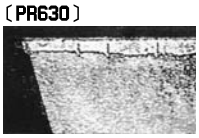
■ Cutting Performance

● **PR630** Wear Resistance

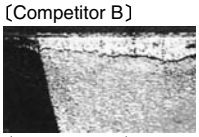


〔Work Material: SCM440, SDKN1203AUTN
V_C=200m/min, a_p=2mm, fz=0.2mm/tooth, Wet〕

〔PR630〕

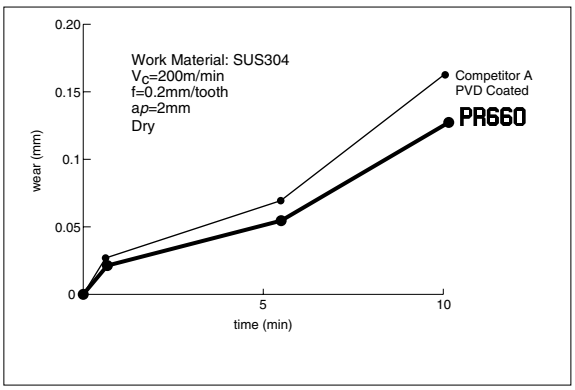


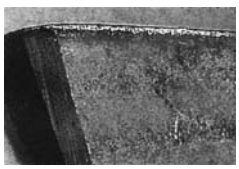
〔Competitor B〕



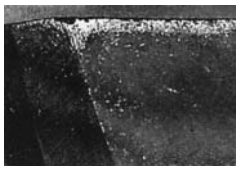
〔Competitor A〕

● **PR660** Performance on stainless steel





PR660



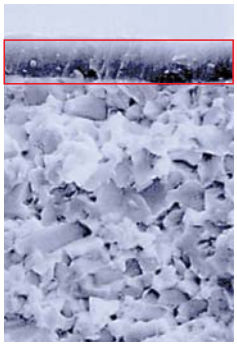
Competitor A

■ High performance PVD Coated Carbide: PR830

PR830 was newly developed for high speed mold machining.
New TiAlN-FS(Fine Surface) coating brings stability and good wear resistance.

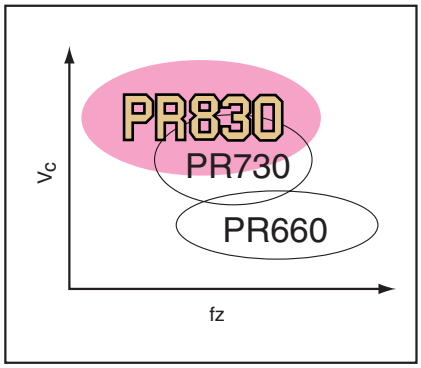
PVD Coated grade / High speed machining and good wear resistance

Coat Layer of PR830

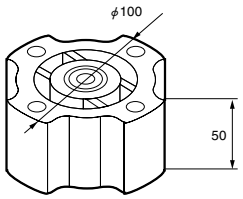


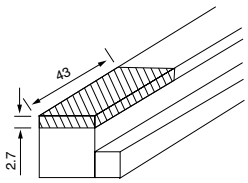
- TiN Coat
- FS Coat (TiAlN)
  Suitable for High Speed Machining and Good Wear Resistance.
- Special tough carbide substrate
  Fracture Resistance to bear Heavy Interrupted Cutting
  Structure for High Tempature Stability

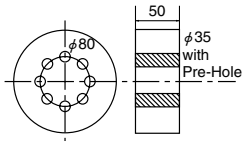
■ Area Map

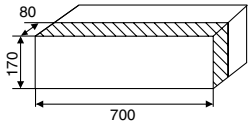


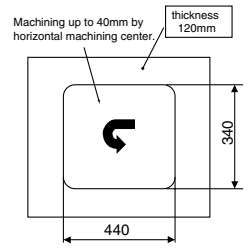
■ Cutting Data

FCD450	
Pump Parts	
• Vc=160m/min • ap=1～2mm • fz=0.07mm/tooth • Dry • SBEN1203 (Special Insert)	
PR510	1,200 pcs/corner
Competitor's Coated A	850pcs/corner

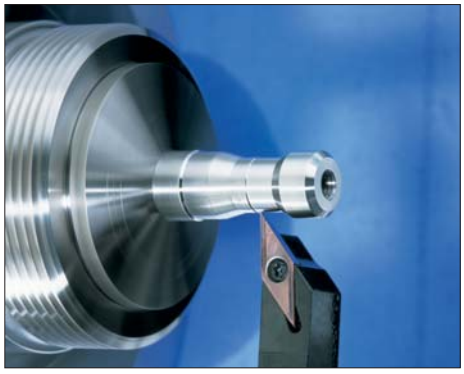
SUS304	
Base	
• Vc=320m/min • ap=2.7mm • fz=0.176mm/tooth (F=900mm/min) • Dry • SOKR13T3AXEN-J • MSO45160R	
PR660	450 pcs/corner
Competitor's Carbide T	200 pcs/corner

SUS40-J2	
Flange	
• Vc=70m/min • ap=5mm • fz=0.1mm/tooth • Dry • NEMT120308ER-D MEZ25-S25	
PR730	8 pcs/corner (machined length)
Competitor's Coated B	5 pcs/corner

SKD61	
Plate	
• Vc=100m/min • ap=5mm • fz=0.15mm/tooth • Dry • Special Round shape Insert • Endmill	
PR730	73m (Machined Length)
Competitor's Cermet A	40m

S50C	
Mold	
• Vc=220m/min • ap=2.5mm • fz=0.25mm/tooth • Dry • PRMT1606M0-H (PR730) • MRP063-S42-16	
Result	Increased f to 0.25mm from 0.15(conventional) for higher efficiency. The amount of wear was improved to half of that of conventional grade.

Insert Grades
PVD Coated Carbide for High Precision Machining



● PVD Coated Carbide for High Precision Machining

Kyocera's PVD coated carbide for high precision machining is developed to meet the requirement from 'IT' industries, fully utilizing the Ceramic's thin film coating technology and precise edging technology.

● Advantages

- Available for wide range of machining from low to high speed, from light cutting to super-fine finishing
- Available for various materials from free cutting steel to stainless steel due to the strong cutting edge, superior edge forming performance, low affinity any high anti-reactivity to metals
- Available for high quality & high precision machining to meet exacting needs for fine surface finish

■ Kyocera's PVD Coated Carbide for high precision machining Lineup

PR905
- Available for high speed machining of information related equipment parts
- Available for high-speed & high-efficiency machining due to specific carbide substrate with high-hardness and high plastic deformation resistance
- TiAlN-based PVD coat with superior wear resistance and anti-oxidation performance (FS Coat)

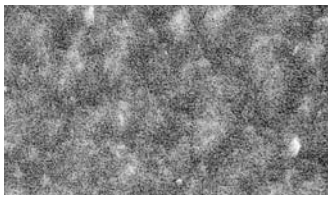
PR915
- Available for high precision machining of information related equipmen parts
- Stable & high reliability machining of super-precision parts by adopting super micro-grain carbide substrate with high strength
- TiAlN-based PVD coat with superior wear resistance and anti-oxidation performance (FS Coat)

PR930
- Combination of super micro-grain carbide substrate with the highest bending strength (4000Mpa) and high strength TiCN-based PVD coat for precision machining
- Outstanding stability and long tool life at the precision machining which requires sharp cutting edge for small parts machining, grooving, threading, and so on, covering the machining range of carbide and high-speed steel

■ Application

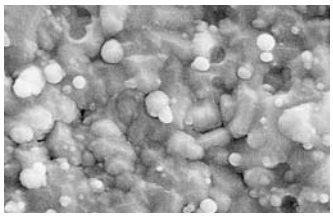
Work Material		General Steel (Carbon Steel/Alloy Steel)					Stainless Steel					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range		Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling Drilling	PR Series	PR905 / PR915 / PR930					PR905 / PR915 / PR930								

FS Coat



FS (Fine Surface) Coat
New TiAlN-based PVD coat with flat and excellent smooth surface with high wear resistance and high thermal stability for super-micro machining.

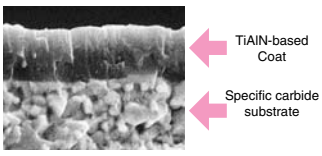
Conventional Coat



■ Coat Layer

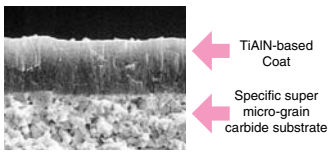
PR905

●Advantages
- Available for high speed machining of information related equipment parts
- Available for high-speed & high-efficiency machining due to specific carbide substrate with high-hardness and high plastic deformation resistance
- TiAlN-based PVD coat with superior wear resistance and anti-oxidation performance (FS Coat)



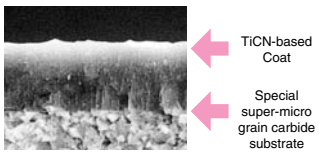
PR915

●Advantages
- Available for high precision machining of information related equipment parts
- Stable & high reliability machining of super-precision parts by adopting super micro-grain carbide substrate with high strength
- TiAlN-based PVD coat with superior wear resistance and anti-oxidation performance (FS Coat)

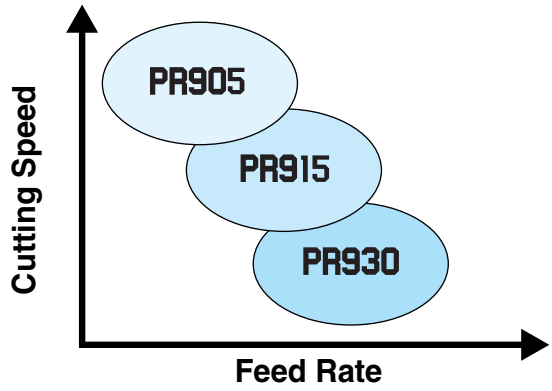


PR930

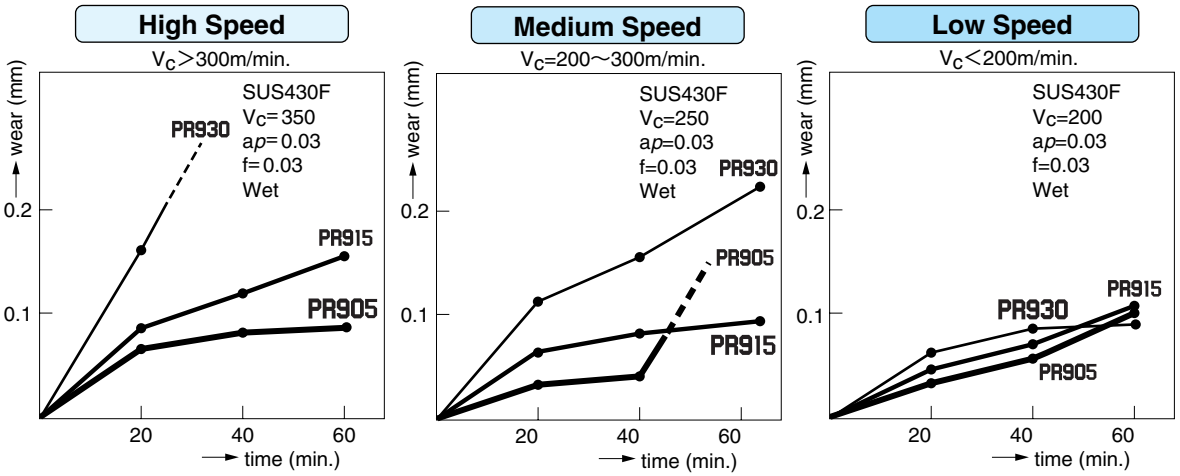
●Advantages
- Combination of super micro-grain carbide substrate with the highest bending strength (4000Mpa) and high strength TiCN-based PVD coat for precision machining
- Outstanding stability and long tool life at the precision machining which requires sharp cutting edge for small parts machining, grooving, threading, and so on, covering the machining range of carbide and high-speed steel



Area Map

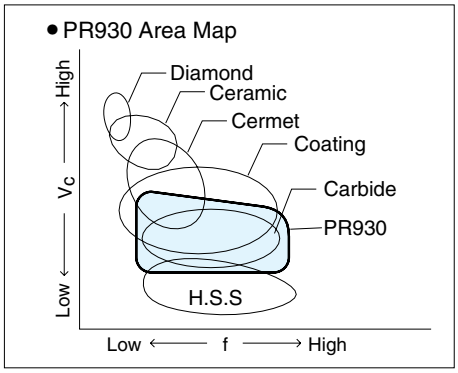


Wear condition of PR900 series

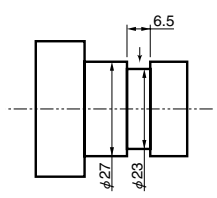


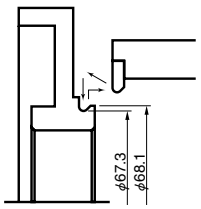
Super micro grain carbide + TiCN base special PVD Coat (Red Coat) PR930

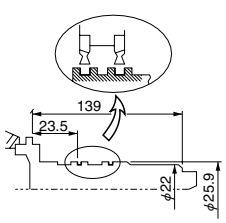
PR930 has super micro grain substrate with the highest bending strength (4,000MPa) and TiCN base special PVD coat (red coat) for high precision machining.
It is suitable for machining of small parts, grooving and threading requiring sharp cutting edge, especially with the cutting speed less than V_c=150m/min.



Cutting Data

S45C	Input Shaft	● V_c=123~138m/min ● a_p 1.45mm ● f=0.1mm/rev ● Wet	
PR930			2,000 pcs/corner
Competitor's carbide A			400 pcs/corner

S45C (Normalized)	Hub	● V_c=135m/min ● a_p 0.41mm ● f=0.065mm/rev ● Wet	
PR930			2,000 pcs/corner
Competitor's carbide B + PVD			300 pcs/corner

S45C	Automobile Part	● V_c=117~138m/min ● f=0.05~0.1mm/rev ● Wet ● Special Insert	Grooving 
PR930			2,000 pcs/corner
Competitor's Coated C			400 pcs/corner

Insert Grades
Ceramic

● Ceramic

Ceramic inserts are capable of running at high speeds thus reducing expensive machining times. Hard turning of 38HRC to 64HRC carbon steels, alloy steels and tool steels, or rough and finish turning of cast irons and malleable cast irons is easily accomplished by the utilization of Ceramic inserts. Kyocera CERATIP cutting tool's ceramic inserts are designed to resist oxidation and maintain hardness at elevated temperatures.

● Advantages

- Super high cutting speed is available by excellent wear resistance and less crater wear performance .
- Maintain good surface finish for a long time due to low affinity to workpiece materials.
- Improved thermal shock performance in KS500, KS6000 and KS7000, and wet cut of cast iron is available.

■ Kyocera's Ceramic Lineup & Features

KA30 Aluminum Oxide Ceramic.
For cast iron with high cutting speed.

SN60 Aluminum Oxide and Zirconium
Designed for finish turning of cast iron.

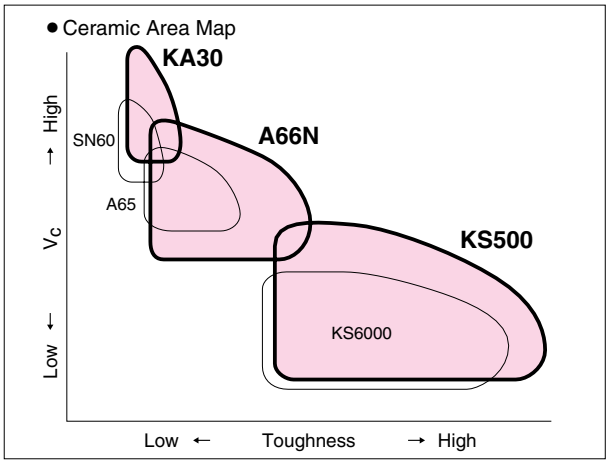
A65 Aluminum Oxide and Titanium Carbide
Designed for middle to finish of steel, cast iron and high hard material.

A66N Aluminum Oxide and Titanium Carbide with TiN coating.
Tougher and more wear resistant than conventional black ceramics.

KS500 Silicon Nitride Ceramic.
Designed for interrupted, high feed machining of cast iron (wet machining is available)

KS6000 Silicon Nitride Ceramic.
Designed for rough turning of cast iron and high temperature alloy

● Ceramic Area Map



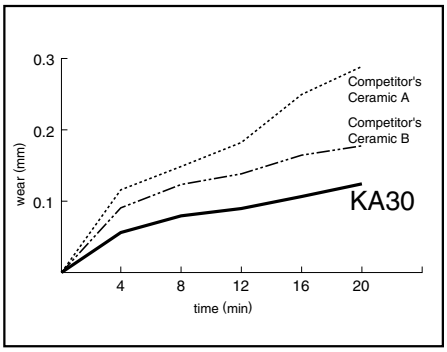
■ Application

Work Material	General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range	Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning / Ceramic											KA30, SN60, A65, A66N, KS500, KS6000			

Work Material	Non-ferrous Material (Aluminium/Non-ferrous Metal)				Hard-to-machine Material (Titanium Alloy / Ni Alloy)				High Hard Mat'l (Heat Treated Steel / Chilled Cast Iron)			
Cutting Range	Finishing ⟷ Roughing				Finishing ⟷ Roughing				Finishing ⟷ Roughing			
JIS Classification	N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning / Ceramic									A65, A66N			

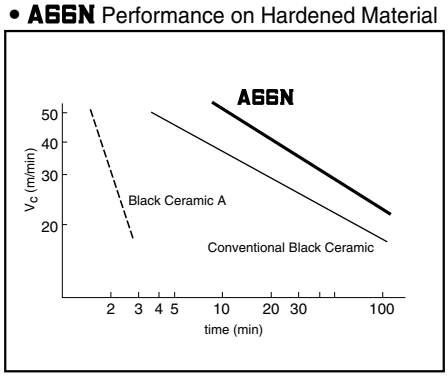
■ Cutting Performance

● KA30 Wear Resistance



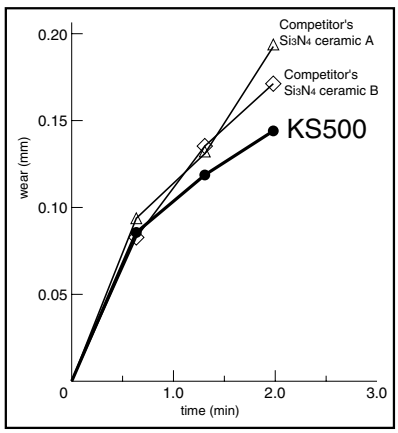
(Work Material: FC250(170HB), Insert: SNGN120408
V_C=450m/min, ap=1.5mm, f=0.3mm/rev, Dry)

● **A66N** Performance on Hardened Material



(Work Material: SKD11(60HRC), Insert: SNGN120408
ap=1mm, f=0.15mm/rev, Dry, V_BMax: 0.3mm)

● KS500 Wear Resistance



(Work Material: FC250, Insert: CNGN120408
V_C=500m/min, ap=2.0mm, f=0.5mm/rev)

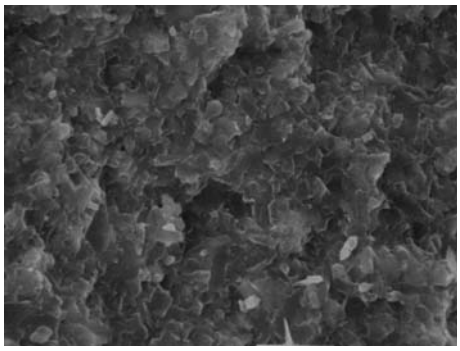
Silicon Nitride Ceramic KS500

■ Silicon Nitride Ceramic: KS500

KS500's wear resistance and crack resistance are greatly improved compared with previous Silicon Nitride Ceramic. The structure of KS500 consists of complex columnar shape crystal and it increased toughness very much and made wet cutting available. M-class inserts are also available.

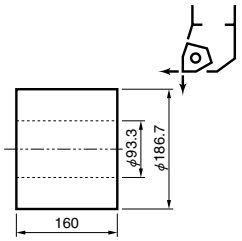
KS500

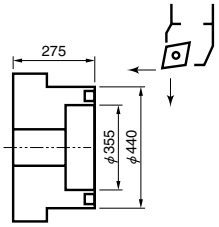
- High speed and high feed rate machining of cast iron
- Available for roughing with coolant.
- Suitable for high speed milling of cast iron, such as cylinder block

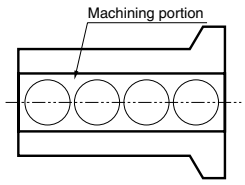


● KS500 Microstructure 1 μm

■ Cutting Date

FC200	
Belt Pully	
● V_C=183m/min ● a_p=3mm ● f=0.28mm/rev ● Dry ● WNMA080416	
KS500	2,000 pcs/corner
Competitor Si_3N_4	1200 pcs/corner
Remarks	● Improved tool life

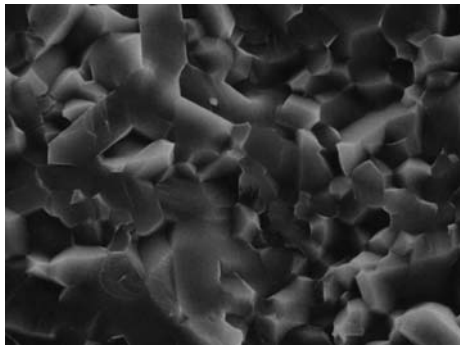
FC250	
Quill	
● V_C=426m/min ● a_p=3mm ● f=0.35mm/rev ● Dry ● CNMA160612 ● Interrupted	
KS500	80 pcs/corner
Competitor Si_3N_4	30 pcs/corner
Remarks	● Improved tool life

FC250	
Cylinder block	
● V_C=120m/min ● a_p=4mm(Max) ● fz=0.3mm/tooth ● Dry ● SNMN120424 ● Milling Cutter 30 teeth	
KS500	700 pcs/corner
Competitor Si_3N_4	250 pcs/corner
Remarks	● Improved tool cost

Aluminum Oxide Ceramic KA30

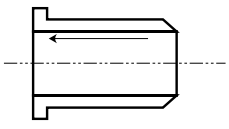
■ Aluminum Oxide Ceramic: KA30

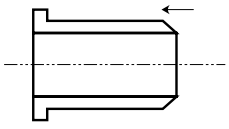
High purity aluminum oxide ceramic KA30 and its minute and uniform microstructure provides excellent wear resistance at high cutting speed of cast iron.

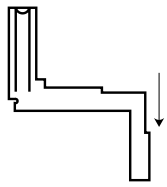


● KA30 Microstructure

■ Cutting Date

FC250	
Sleeve	
● V_C=300m/min ● a_p=0.3mm ● f=0.25mm/rev ● Dry ● SNGN120412	
KA30	500 pcs/corner
Competitor Ceramic A	250 pcs/corner

FC250	
Sleeve	
● V_C=300m/min ● a_p=0.5mm ● f=0.3mm/rev ● Dry ● SNGN120412	
KA30	300 pcs/corner
Competitor Ceramic B	120 pcs/corner

FC230	
Rear Disk	
● V_C=308~339m/min ● a_p=0.5mm ● f=0.27mm/rev ● Dry ● SNGN120412	
KA30	100 pcs/corner
Competitor Ceramic C	50 pcs/corner

Insert Grades
CBN

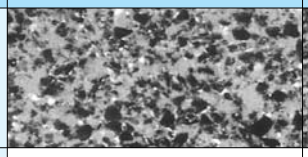
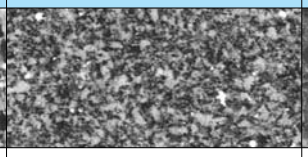
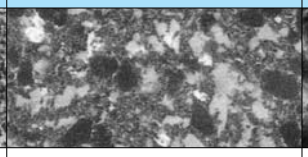
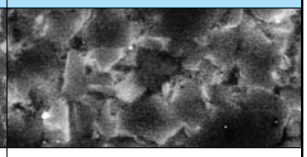
● CBN(Cubic Boron Nitride)

Second only to diamond in hardness. CBN is a synthetically produced material. CBN is a stable material under high temperature conditions.

● Advantages

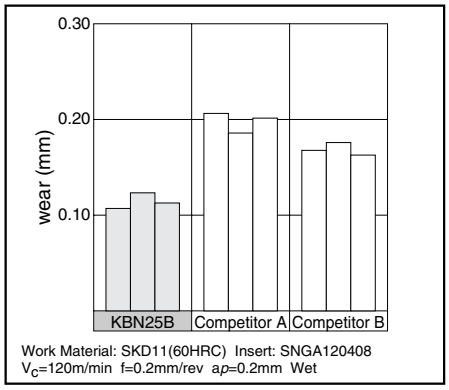
- Long tool life due to high hardness.
- Suitable for high speed machining of cast iron or heat treated steel due to less reactivity to iron
- Stable machining is available due to high thermal conductivity

■ Kyocera's CBN Lineup & Features

Grade	KBN10B	KBN25B	KBN65B	KBN900
Structure				
Hardness (HV)	2,800	2,700	3,150	3,150
Fracture Toughness (MPa $\sqrt{m}$)	5.0	5.0	7.0	7.0
Flexural Strength (MPa)	90～110	120～130	110～120	100～110
Application	General purpose · Finishing	General purpose · Interrupted Cut	Cast Iron	Heavy and Interrupted Cut
Features	Good performance of wear resistance and anti-crack. For hardened material.	For interrupted cut of hardened steel. High speed and high feed rate machining are available.	Long tool life with high cutting speed for cast iron.	Heavy cutting and interrupted cutting of high hard material. High economy with multi corner use.

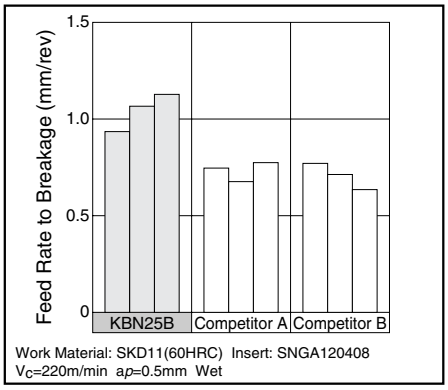
■ Cutting Performance

● **KBN25B** Wear Resistance



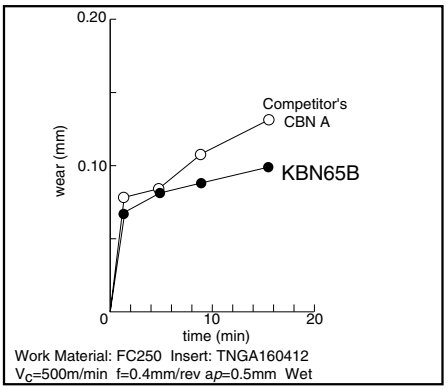
Work Material: SKD11(60HRC) Insert: SNGA120408
V_C=120m/min f=0.2mm/rev a_p=0.2mm Wet

● **KBN25B** Anti-crack Performance



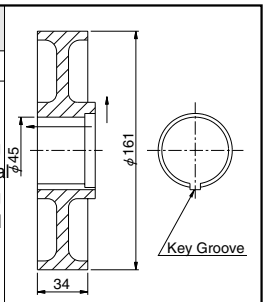
Work Material: SKD11(60HRC) Insert: SNGA120408
V_C=220m/min a_p=0.5mm Wet

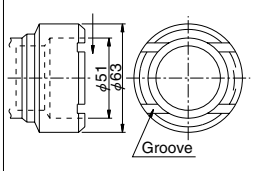
● **KBN65B** Wear Resistance

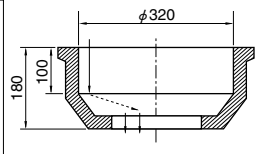


Work Material: FC250 Insert: TNGA160412
V_C=500m/min f=0.4mm/rev a_p=0.5mm Wet

■ Cutting Data

SCr420H		
CAM		
● Hardness 58HRC ● V_C=100m/min ● a_p=0.3mm facing ● a_p=0.15mm Internal ● f=0.1mm/rev facing ● f=0.07mm/rev Internal ● Dry		
KBN25B	66 pcs/corner	
Competitor's CBN A	40 pcs/corner	

SCr420	
Shaft	
● Hardness 60HRC ● V_C=80m/min ● a_p=0.3mm ● f=0.1mm/rev ● Dry	
KBN25B	600 pcs/corner
Competitor's CBN B	150 pcs/corner

FC230	
Brake Drum	
● V_C=800m/min ● a_p=2～3mm ● f=0.5mm/rev ● Dry ● SNMN120412	
KBN900	480 pcs/corner
Competitor's CBN C	200 pcs/corner

● Diamond

Synthetic diamond sintered together under high temperatures and pressures.

● Advantages

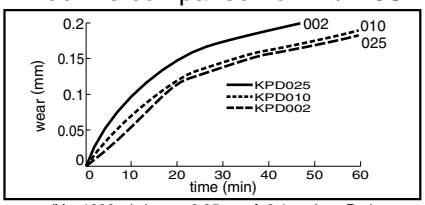
- Long tool life due to high hardness.
- Stable machining is available due to high thermal conductivity.
- High productivity due to high cutting speed.
- High precision machining is available due to less built-up edge.
- Diversified applications for various type of machining of non-ferrous metals and non-ferrous materials

■ Kyocera's Diamond Lineup & Features

Grade	Application	Features	Grade	Application	Features
KPD001 (Av. Grain size under 1 μm)	· For non-ferrous metal such as Aluminum, Brass. · For fiber glass, plastics. · For Tungsten carbide and Ceramic.	· Micro grain diamond. · Strong cutting edge, good wear resistance.	**KPD010** (Av. Grain size 10 μm)	· For non-ferrous metal such as Aluminum, Brass. · For fiber glass, plastics. · For Tungsten carbide and Ceramic.	· Good wear resistance and toughness. · General purpose
KPD002 (Av. Grain size 2 μm)	· For interrupted cut of non-ferrous steel. For plastic, wood etc.	· Good surface finishing. Tough enough for roughing machining.	**KPD025** (Av. Grain size 25 μm)	· For high silicon content materials with high cutting speed. For tungsten carbide and ceramic.	· High wear resistance. · High diamond content

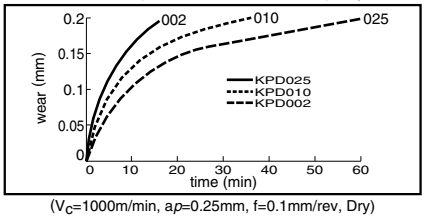
■ Cutting Performance

● Tool life comparison on Aℓ-18S



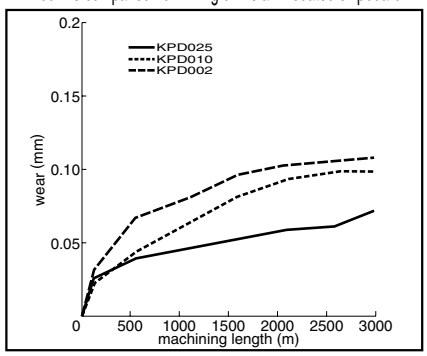
(V_C=1000m/min, ap=0.25mm, f=0.1mm/rev, Dry)

● Tool life comparison on silicated epoxy resin.

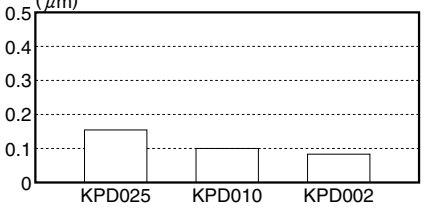


(V_C=1000m/min, ap=0.25mm, f=0.1mm/rev, Dry)

● Tool life comparison of milling of melanin coated chipboard



● Surface roughness after machining aluminum alloy. (Ra) (μm)



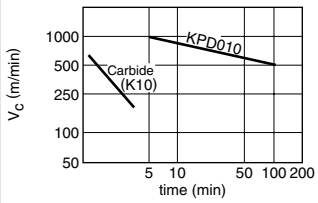
(V_C=1000m/min, f=0.08mm/rev, ap=0.25mm, TPGN160308, Wet)

■ Cutting Data

● KPD010

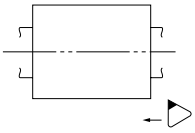
Non-ferrous Metal (High Silicon content Aluminum)

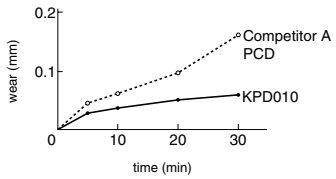
Work Material		18%Si-Al
Shape		TPGN160308
Cutting Conditions	V_C	Variable
	ap	2mm
	f	0.2mm/rev
Standards of wear		V_B=0.4mm
Coolant		Water Based



- Tool life of KPD010 is more than 200 times of carbide (K10).
- Hourly machining amount of KPD010 is 8 times of carbide (K10).

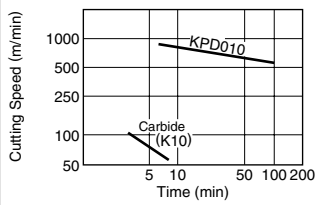
Work Material		Aluminum Alloy 18%Si-Al
Shape		TPGN160308
Cutting Conditions	V_C	700m/min
	ap	0.2mm
	f	0.1mm/rev
Coolant		No





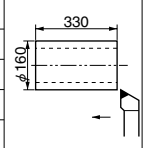
Non-Metal

Work Material		Silica filling resin
Shape		TPGN160308
Cutting Conditions	V_C	Variable
	ap	1mm
	f	0.32mm/rev
Standards of wear		V_B =0.4mm
Coolant		No



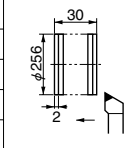
- Machining speed of KPD010 is 10 times of carbide (K10).
- Hourly machining amount of KPD010 is 15 times of carbide (K10).

Work Material		Insulating tube (50% Fiber glass)
Shape		33-3
Cutting Conditions	V_C	236m/min
	ap	2~3mm
	f	0.1mm/rev
Coolant		No



- Tool life of KPD010 : 1000 pcs/c
- Much better surface finish than carbide K10

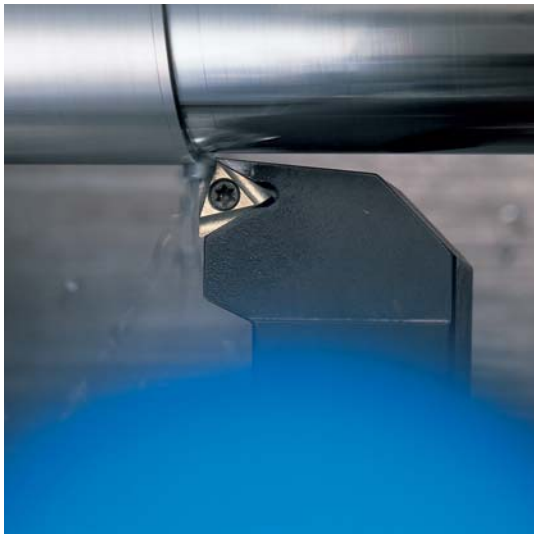
Work Material		FRP Disk
Shape		33-3
Cutting Conditions	V_C	426m/min
	ap	3mm
	f	0.12mm/rev
Coolant		No



15 pcs Packaged

- Tool life of KPD010 : 800pcs /c
- Cutting condition of carbide K05. V_C=38m/min ap=3mm f=0.22mm/rev

Insert Grades
Carbide



● Carbide

Carbide is a very popular grade due to its superior mechanical characteristics. Not only KW10 for non-ferrous metal and cast iron and PW30 for steel milling, but also micro grain carbides and specific carbides for wear parts are available from Kyocera.

● Advanteges

- Tough and hard
- Good thermal conductivity and suitable for machining non-ferrous metals and non-metals with sharp cutting edge.
- Stable machining at slow cutting speed and milling applications.

■ Kyocera's Carbide Lineup & Features

KW10 ISO K10 grade.
High wear resistance and anti-chipping performance for cast iron and non-ferrous metals.

PW30 ISO P30 grade.
High wear resistance and anti-chipping performace at milling operation

■ Application

Work Material		General Steel (Carbon Steel/Alloy Steel)					Stainless Steel (Stainless Steel/Steel Castings)					Cast Iron (Gray Cast Iron/Ductile Cast Iron)			
Cutting Range		Finishing ⟷ Roughing					Finishing ⟷ Roughing					Finishing ⟷ Roughing			
JIS Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling Drilling	Carbide				PW30								KW10		

Work Material		Non-ferrous Material (Aluminium/Non-ferrous Metal)				Hard-to-machine Material (Titanium Alloy / Ni Alloy)				High Hard Mat'l (Heat Treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ⟷ Roughing				Finishing ⟷ Roughing				Finishing ⟷ Roughing			
JIS Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning Milling Drilling	Carbide		KW10				KW10						

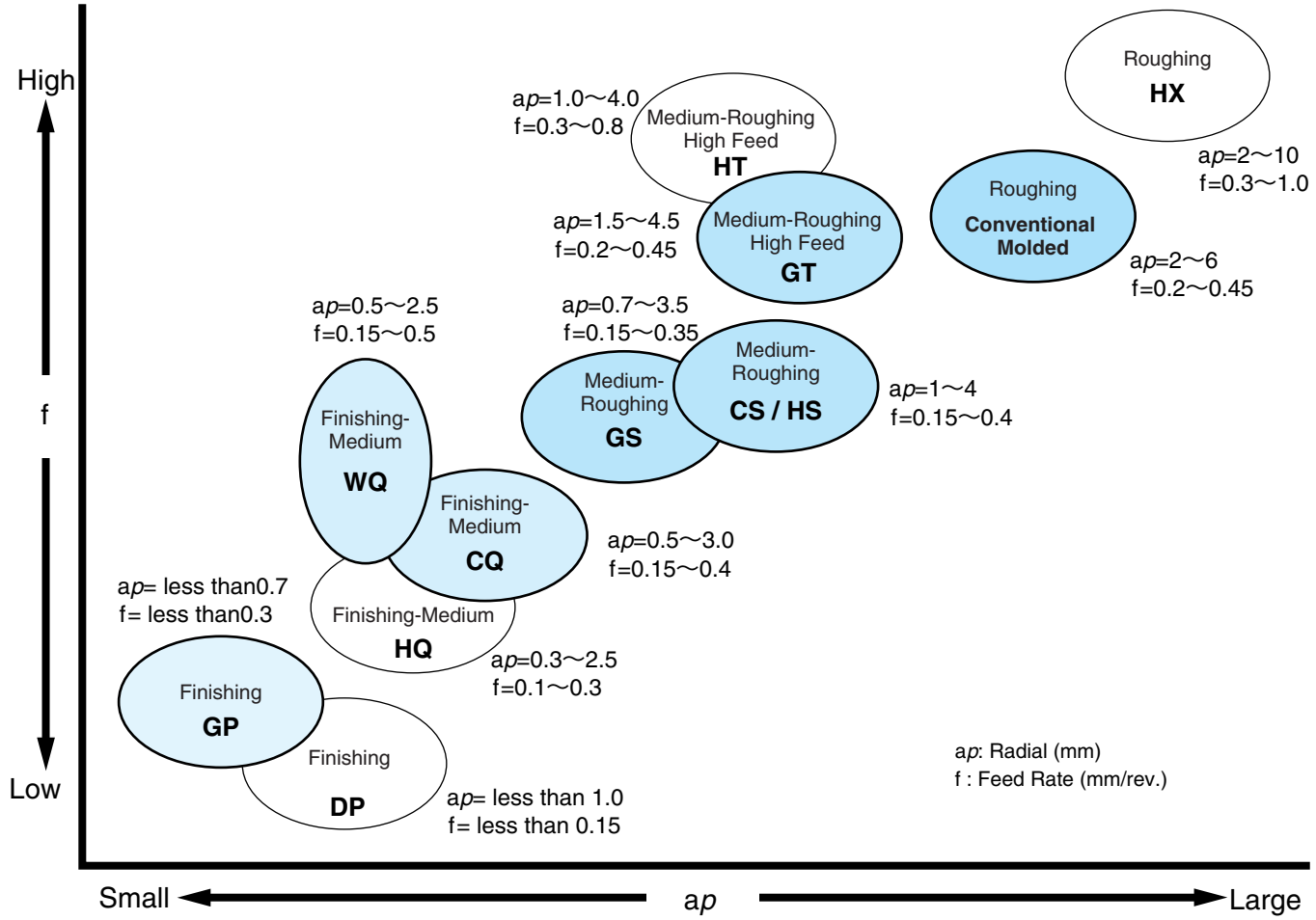
Turning Indexable Inserts

25～88

※See Page.441-466 for CBN & Diamond Tools.

General Steel

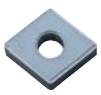
1 Molded Chipbreaker



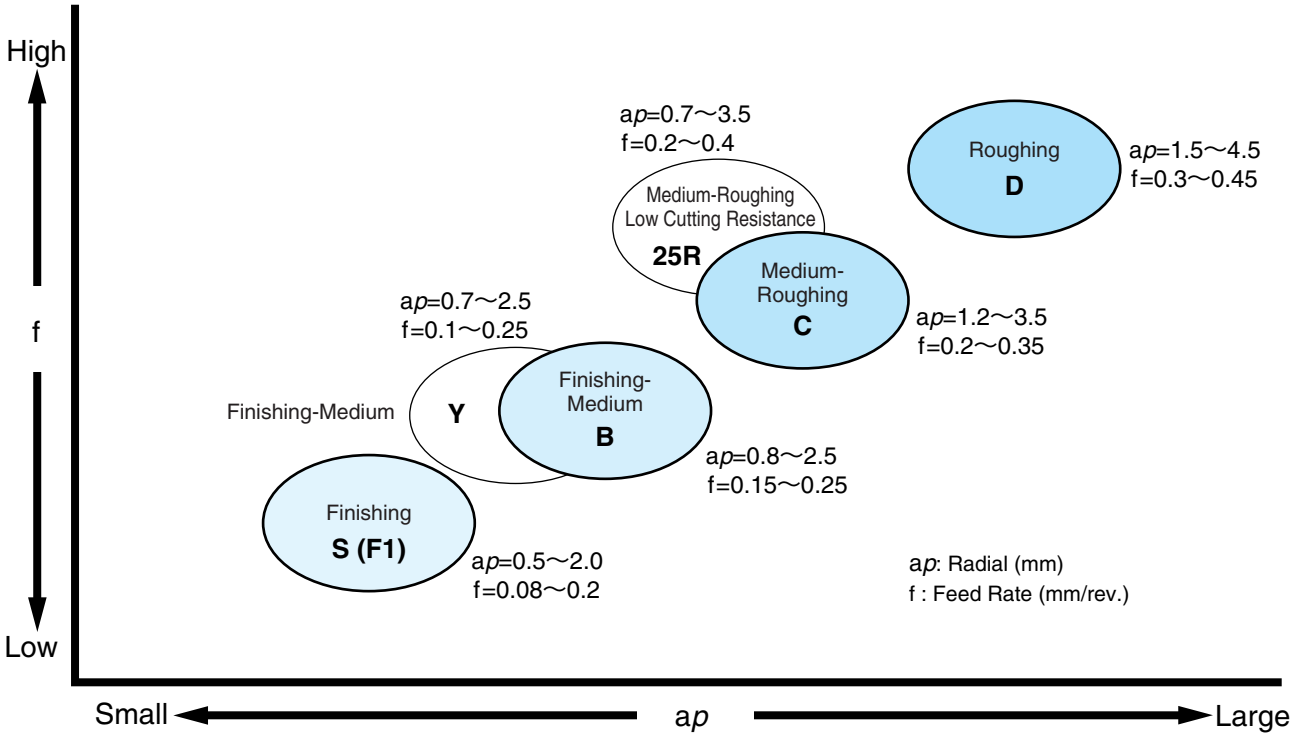
Main Chipbreaker

Cutting Range	Name	Shape			Advantages
Finishing	GP			 GP	Finishing to Light Cutting. Good Chip Control.
Finishing-Medium (With Wiper Edge)	WQ			 WQ	Wiper Insert. Double Feed Rate Available while maintaining Surface Roughness. High Efficiency and Good Chip Control.
Finishing-Medium	CQ			 CQ	Good Chip Control at Varied *ap* such as Copying. Suitable for Pull-up Facing too.
Medium-Roughing	GS			 GS	Strong Edge Chipbreaker. Stable at Repeat Machining and Light Interrupted Cutting.
Medium-Roughing	CS			 CS	Strong Edge Chipbreaker for General Purpose. Stable at Repeat Machining and Light Interrupted Cutting.
Medium-Roughing High Feed	GT			 GT	Strong Edge Chipbreaker. Wide Land Design and Smooth Chip Control even at High Feed Rate Machining.
Roughing	Conven-tional Molded			 Conventional Molded	Low Cutting Force and Suitable for Large *ap* Roughing.

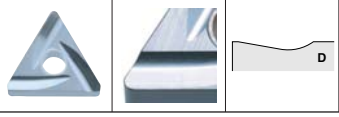
Sub Chipbreaker

Cutting Range	Name	Shape			Advantages
Finishing	DP			 DP	Finishing Operation with Minute *ap* and Feed Rate.
Finishing-Medium	HQ			 HQ	Sharp Cutting Performance and Wide Range Chip Control with 3-D Rake Angle and Double Projection Design.
Medium-Roughing	HS			 HS	General Purpose Chipbreaker. Suitable for Copying too.
Medium-Roughing High Feed	HT			 HT	Low Cutting Force at High Feed Rate Machining. Strong Edge and Suitable for Interrupted Cutting too.
Single Sided Roughing High Feed	HX			 HX	Roughing and High Feed Rate Operation. Low Cutting Force Chipbreaker.

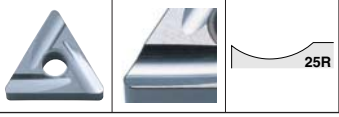
2 Ground Chipbreaker



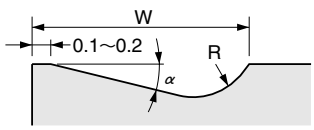
Main Chipbreaker

Cutting Range	Name	Shape	Advantages
Finishing	S		Sharp Edge and Less Cutting Force. Good Chip Control and Smooth Chip Evacuation.
Finishing-Medium	B		Suitable for General Purpose Machining at Feed Rate 0.15 to 0.25mm/rev.
Medium-Roughing	C		Suitable for General Purpose Machining at Feed Rate 0.20 to 0.35mm/rev.
Roughing	D		Suitable for General Purpose Machining at Feed Rate 0.30 to 0.45mm/rev.

Sub Chipbreaker

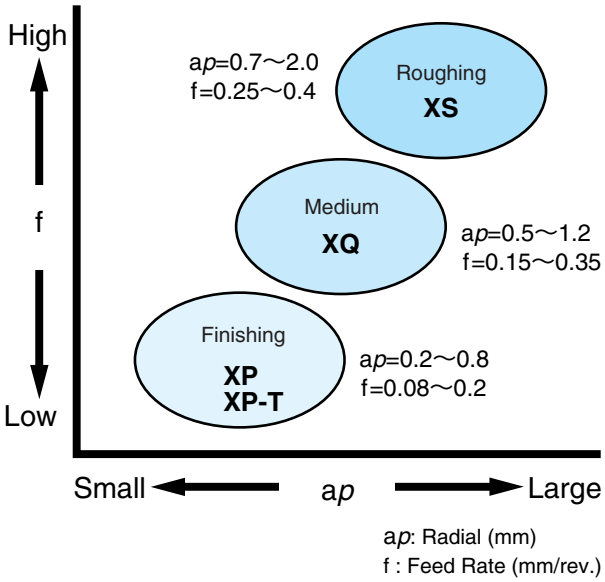
Cutting Range	Name	Shape	Advantages
Finishing	F1		Good Chip Control from Light Cutting to Finishing. Suitable for Sticky Material too.
Finishing-Medium	Y		Light Cutting and Small Curled Chip. Suitable for Small Dia. Copying too.
Medium-Roughing Low Cutting Resistance	25R		Suitable for Sticky Material such as Low Carbon Steel. Large Rake Angle and Suitable for Stainless Steel too.

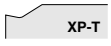
• Specification of B, C, D and Parallel Ground Chipbreaker (With Hand: Without Indication)



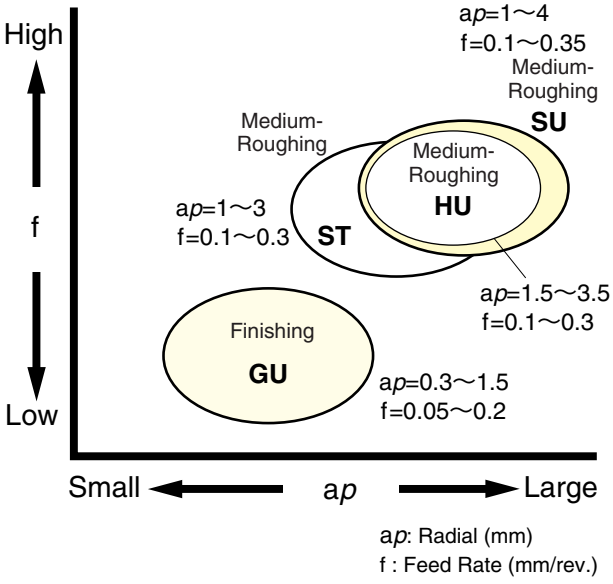
Insert Type	Size	Chipbreaker Name	W	α	R
CNGG	09,12	Without Indication (similar to C)	2.2	14°	1.0
WNGG	06	Without Indication (similar to C)	2.2	14°	1.0
TNGG	11,16	B	1.5	14°	0.5
	16,22	C	2.2	14°	1.0
	16,22	D	2.8	10°	1.5
DNGG	11,15	Without Indication (similar to C)	2.5	14°	2.0
VNGG	16	Without Indication (similar to B)	1.5	14°	0.5
SNGG	09,12	B	1.5	14°	0.5
	12	C	2.2	14°	1.0

Soft Steel (SP/Pipe/SS)



Cutting Range	Name	Shape			Advantages
Finishing	XP				Shortly Broken Chip at Finishing due to Rake Face for Sharp Cutting and Special Projection Design.
Finishing	XP-T				Tough Edge Type for Finishing. Recommended to Interrupted Cutting and Unstable Finish Operation.
Medium	XQ				Sure Chip Breaking at Medium Cutting due to Gentle Rake Face and Special Projection Design.
Roughing	XS				Sure Chip Breaking at Roughing due to Specific Rake Face and Acute Projection Design.

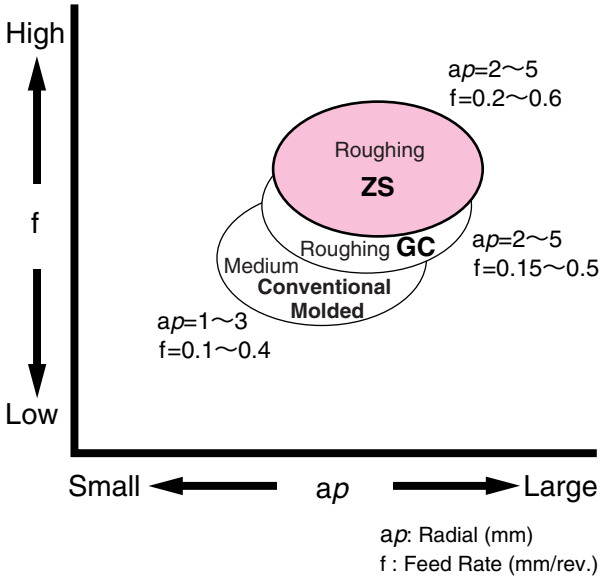
Stainless Steel



Cutting Range	Name	Shape			Advantages
Finishing	GU				Sharp Cutting Performance and Low Cutting Force due to 3-D Rake Angle. Suitable for Small Shaft Machining.
Medium-Roughing	HU				Sharp Cutting Performance and Strong Edge due to 3-D Rake Angle. Suitable for Small Shaft Machining.
Medium-Roughing	SU				Less Cutting Resistance due to Large Rake Angle. Less Notching by Special Design.
Medium-Roughing	ST				Less Cutting Load to the Edge and Longer Tool Life due to Smoothly Curled Chips of even Stainless Steel.

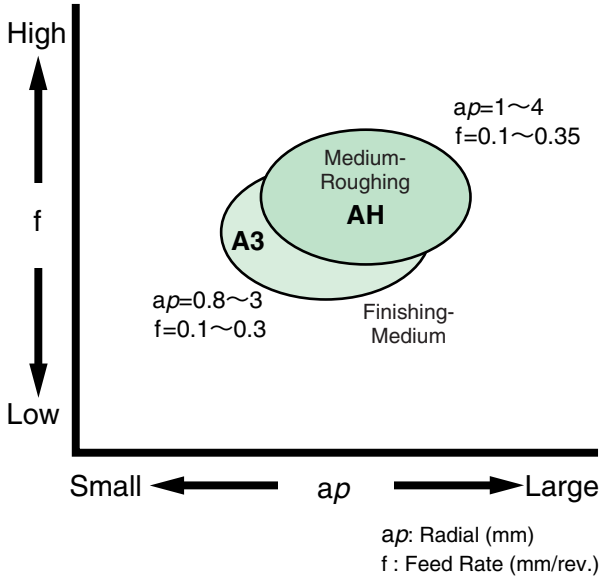
Chipbreaker Selection (Negative Inserts) Cast Iron/Non-ferrous Metal

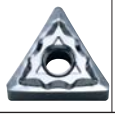
Cast Iron



Cutting Range	Name	Shape			Advantages
Medium	Conven-tional Molded				Basic Chipbreaker for Cast Iron
Roughing	ZS				Land Support Structure. Stable at High Feed Rate Roughing.
Roughing	GC				Strong Edge Chipbreaker. Good for Ductile Cast Iron.

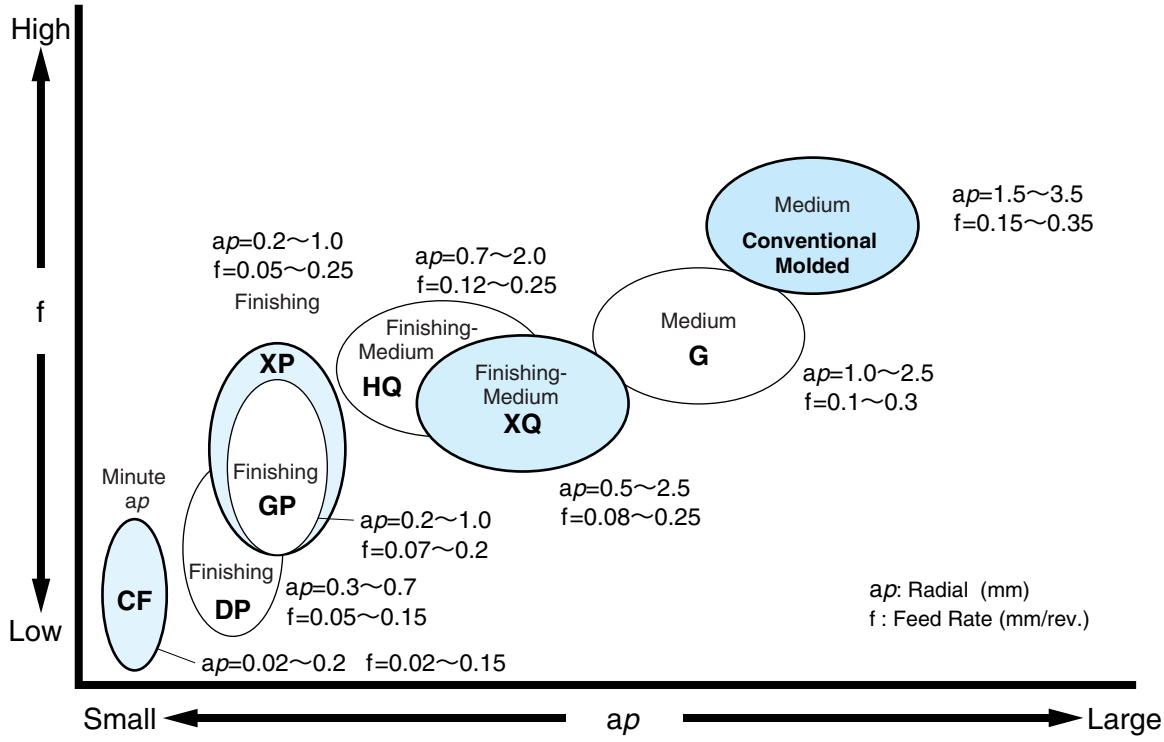
Non-ferrous Metal



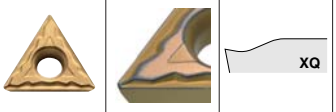
Cutting Range	Name	Shape			Advantages
Finishing-Medium	A3				Large Rake Angle and Smooth Surface. Good Chip Control and Less Adhesion.
Medium-Roughing	AH				Polished Chipbreaker. Smooth Chip Control and Less Adhesion.

General Steel

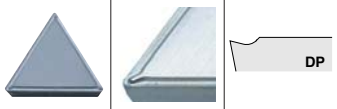
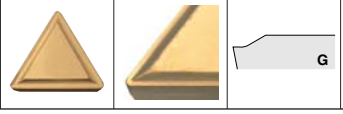
1 Molded Chipbreaker



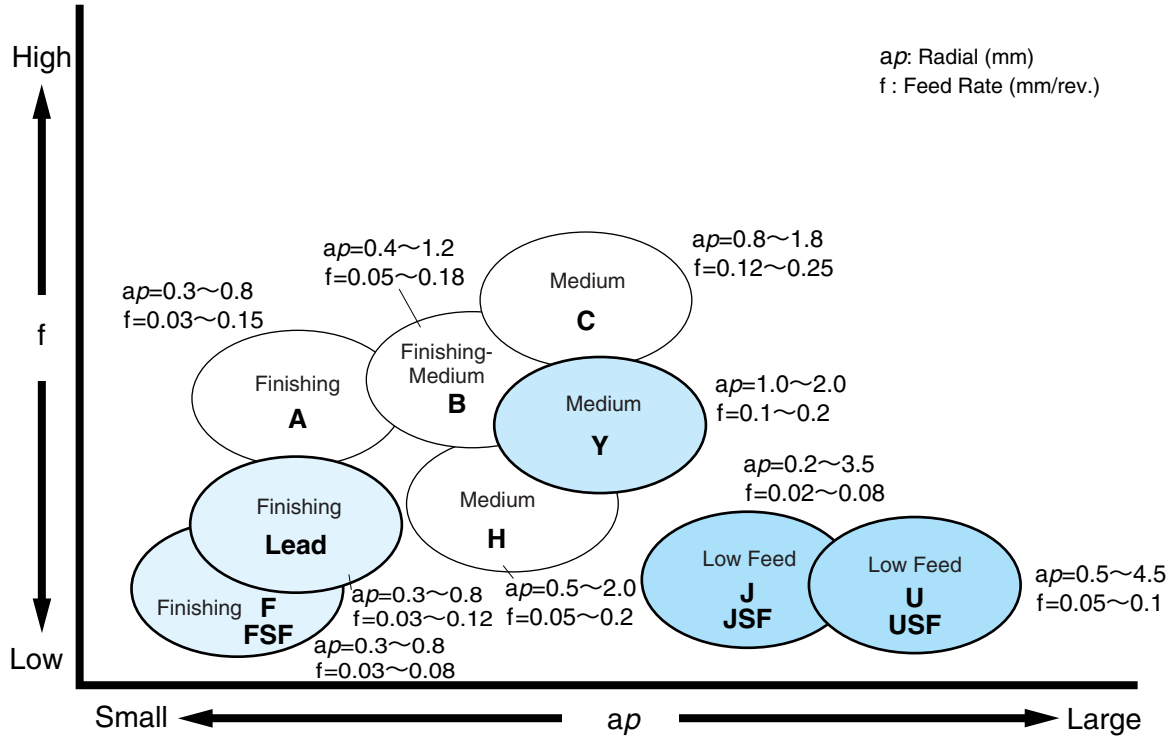
Main Chipbreaker

Cutting Range	Name	Shape	Advantages
Minute ap	CF		Available to Minute ap (0.02 - 0.2mm) Finishing.
Finishing	XP		Sure Chip Breaking Performance even to Sticky Material.
Finishing-Medium	XQ		Wide Chip Control Range and Sharp Cutting Performance. Suitable for Sticky Material.
Medium	Conven-tional Molded		Strong Edge Chipbreaker for Medium Cutting Range.

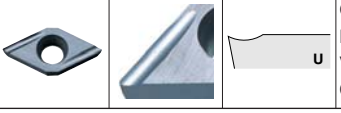
Sub Chipbreaker

Cutting Range	Name	Shape	Advantages
Finishing	GP		Good Chip Control at Finishing. Suitable for Sticky Material like Low Carbon Steel, Pipe Material.
Finishing	DP		Sure Chip Breaking Performance at Finishing.
Finishing-Medium	HQ		General Purpose Chipbreaker for Medium Cutting.
Medium	G		Chipbreaker for Short Chips at Medium Cutting.

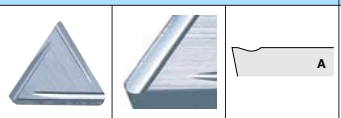
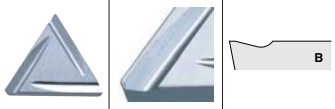
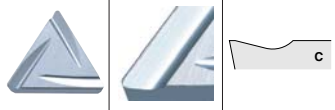
2 Ground Chipbreaker



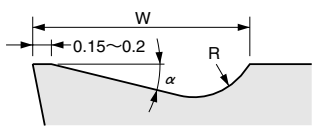
Main Chipbreaker

Cutting Range	Name	Shape	Advantages
Finishing	**Lead** (Without Indication)		Good Chip Control at Finishing to Light Cutting with Less Cutting Force.
Finishing	**F FSF**		Good Chip Control at Finishing to Light Cutting with Less Cutting Force.
Medium	**Y**		Sharp Cutting Performance and Good Surface Finish.
Low Feed	**J JSF**		Slant Chipbreaker Width and Chip Control at Various ap Suitable for Automatic Lathe.
Low Feed	**U USF**		Good Chip Control at Low Feed Rate and Varied ap with Less Cutting Force.

Sub Chipbreaker

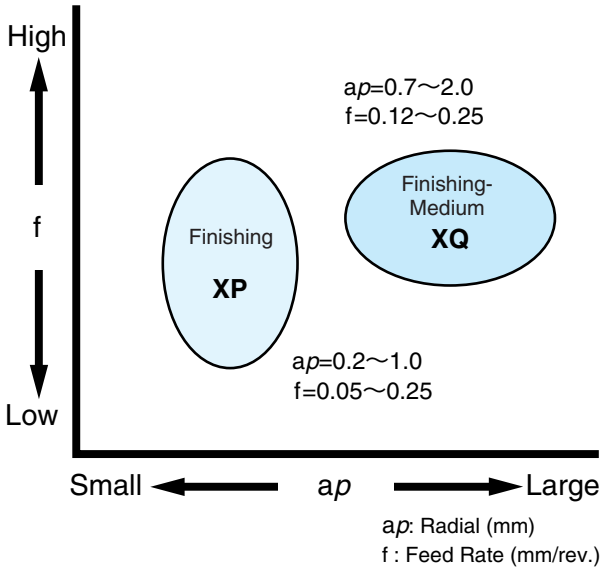
Cutting Range	Name	Shape	Advantages
Finishing	**A**		Large Rake Angle and Less Cutting Force. Narrow Chipbreaker Width and Sure Chip Control.
Finishing-Medium	**B**		General Purpose at Light Cutting Range. Good Balance between Chip Control and Sharp Cutting.
Medium	**C**		Suitable for High Load Cutting. Good Chip Flow and Less Resistance.
Medium	**H**		Sharp Cutting Performance and Small Curled Chips.

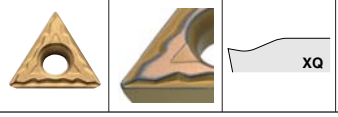
• Specification of A, B, C and and Parallel Ground Chipbreaker (With Hand: Without Indication)



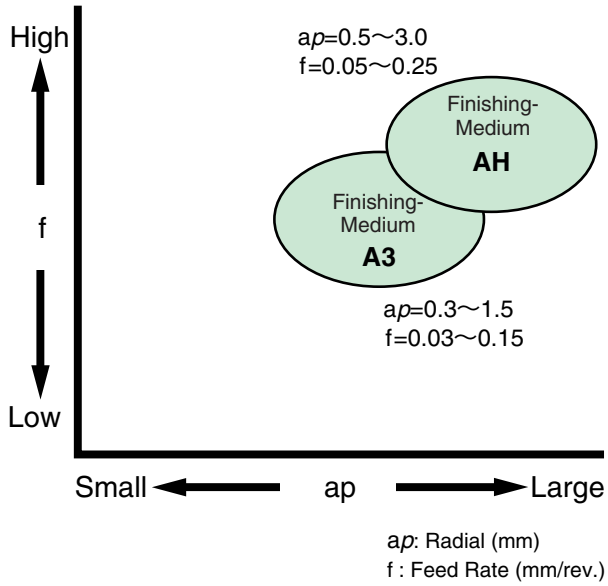
Insert Type	Size	Chipbreaker Name	W	α	R
TPGR	11	A	1.0	17°	0.5
	11,16	B	1.5	14°	0.5
	16	C	2.2	14°	1.0
SPGR	09	Without Indication (similar to B)	1.5	14°	0.5
	12	Without Indication (similar to C)	2.2	14°	1.0

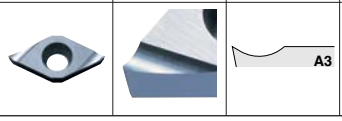
Soft Steel



Cutting Range	Name	Shape	Advantages
Finishing	XP		Suitable for Sticky Material such as Soft Steel.
Finishing-Medium	XQ		Wide Chip Control Range and Sharp Cutting Performance. Suitable for Sticky Material.

Non-ferrous Metal



Cutting Range	Name	Shape	Advantages
Finishing-Medium	AH		Arc Shape Rake Face and Good Chip Control with Less Cutting Force. Polished Surface and Less Adhesion.
Finishing-Medium	A3		Large Rake Angle, Smooth Chip Flow and Less Adhesion. Sharp Edge and Good Surface Finish.

Turning Indexable Inserts Identification System

Symbol	Shape
H	120° Hexagon
O	135° Octagon
P	108° Pentagon
R	Round
S	90° Square
T	60° Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
M	86° Rhombic
F	50° Rhombic
V	35° Rhombic
L	90° Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
W	80° Hexagon

Angle Showed means Acute Angle for Rhombic and Parallelogram Inserts.

①Shape Symbol

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P※	11°

※Simbol P may have 10°as an Exception. Relief Angle mentioned here is the One to the Major Cutting Edge.

②Relief Angle Symbol

Symbol	Corner Height(mm)	Thickness (mm)	IC Size(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.025	±0.013
C	±0.013	±0.025	±0.025
H	±0.013	±0.025	±0.013
E	±0.025	±0.025	±0.025
G	±0.025	±0.13	±0.025
J	±0.05	±0.025	±0.05～±0.13
K※	±0.013	±0.025	±0.05～±0.13
L※	±0.025	±0.025	±0.05～±0.13
M※	±0.08～±0.18	±0.13	±0.05～±0.13
N※	±0.08～±0.18	±0.025	±0.05～±0.13
U※	±0.13～±0.38	±0.13	±0.08～±0.25

※Insert's Periphery is as Fired. Tolerance differs depending on Insert Size.

③Tolerance Symbol

New Symbol	Hole	Hole Shape	Chip-breaker	Hole Shape	Old Symbol Normal	Old Symbol Small
N	Without Hole	–	No		N	E
R			One Side		R	S
F			Two Sides		F	L
A	With Hole	With Hole	No		A	D
M			One Side		M	P
G			Two Sides		G	K
W		With Hole and One Countersink 40° ～60°	No		A	D
T			One Side		M	P
Q		With Hole and Two Countersink 40° ～60°	No		A	D
U			Two Sides		G	K
B		With Hole and One Countersink 70° ～90°	No		A	D
H			One Side		M	P
C		With Hole and Two Countersink 70° ～90°	No		A	D
J			Two Sides		G	K
X	–	–	–	–	X	X

④Hole/Chipbreaker Symbol

C	N	M	G	12	04	08	CS
①	②	③	④	⑤	⑥	⑦	⑧

IC Size (mm)	⑤Edge Length Symbol (New) T	S	C	D	V	R	W	⑤IC Simbol (Old) Normal	Small
3.97	06	03	03	04					5
4.76	08	04	04	05					6
						05			
5.56	09	05	05	06			03		7
6.0						06			
6.35	11	06	06	07			04	2	(8)
7.94	13	07	08	09			05		0
8.0						08			
9.525	16	09	09	11	16	09	06	3	
10.0						10			
12.0						12			
12.70	22	12	12	15	19	12	08	4	
15.875	27	15	16	19		15	10	5	
16.0						16			
19.05	33	19	19	23		19	13	6	
20.0						20			
22.225	38	22	22	27				7	
25.0						25			
25.40	44	25	25	31		25		8	
31.75	53	31	32	38		31		0	
32.0						32			

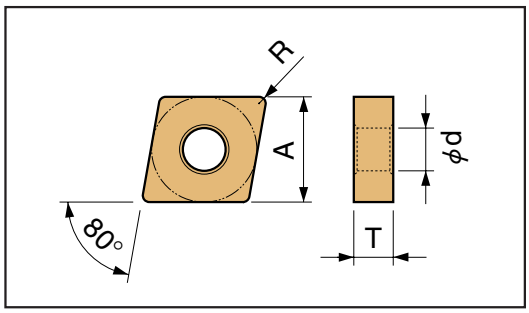
⑥Thickness Symbol Thickness (mm)	New Symbol	Old Symbol Normal	Old Symbol Small
1.59	01	–	2
2.38	02	–	3
2.78	T2	–	–
3.18	03	2	4
3.97	T3	–	5
4.76	04	3	6
6.35	06	4	–
7.94	07	5	–
9.52	09	6	–

⑦Corner-R Symbol Corner-R (mm)	Symbol (New)	Symbol (Old)
Sharp Corner	00	V
0.2	02	O
0.4	04	1
0.8	08	2
1.2	12	3
1.6	16	4
2.0	20	5
2.4	24	6
2.8	28	7
3.2	32	8
Round Insert	00 (inch) or M0 (metric)	0

⑧Major

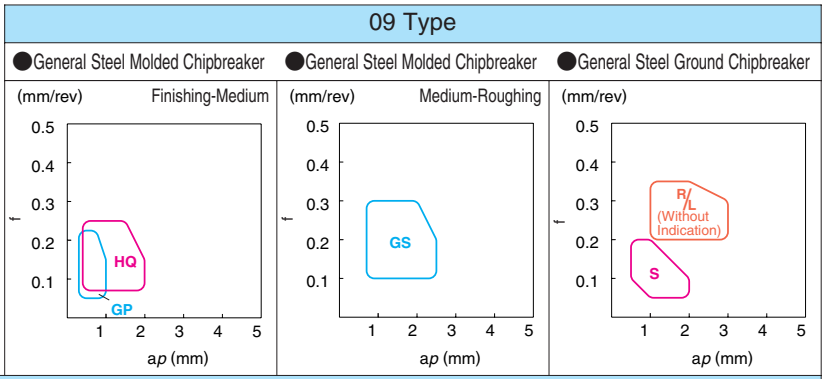
Major Edge Symbol, Hand Symbol, Chipbreaker Symbol, etc.

■ Rhombic 80° · Negative · with Hole

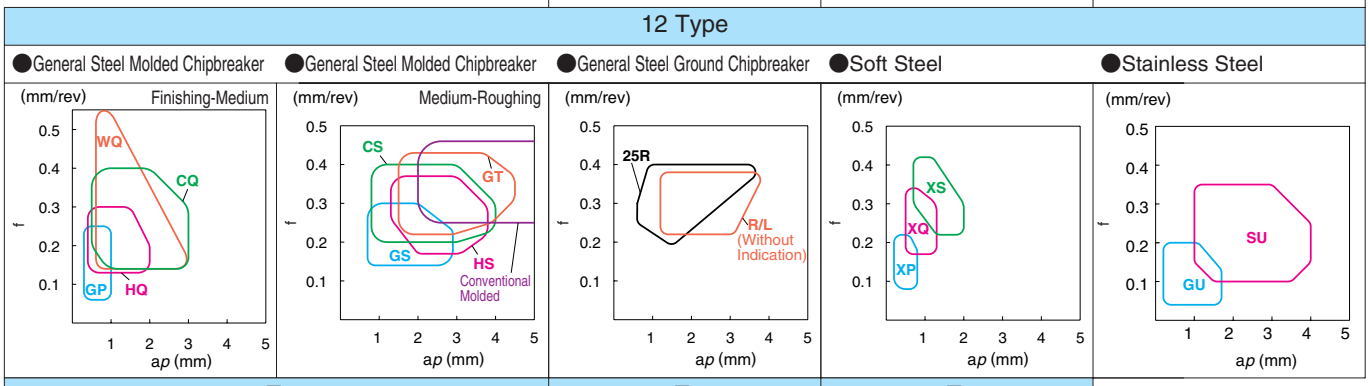


Application Range

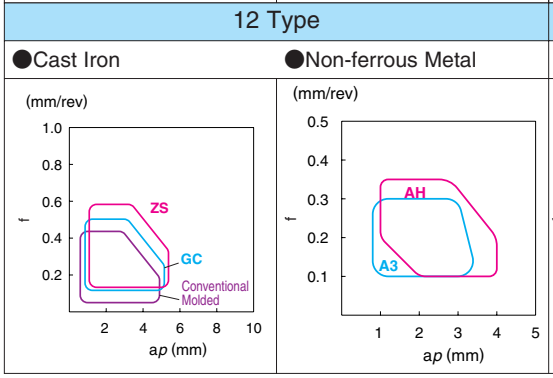
09 Type



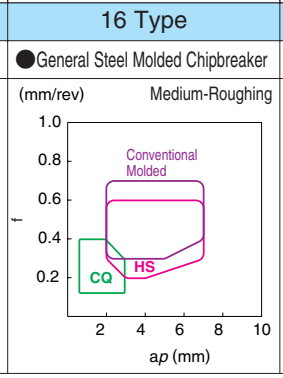
12 Type



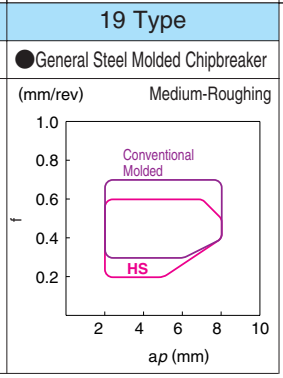
12 Type

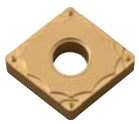
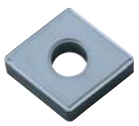


16 Type



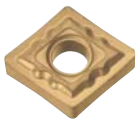
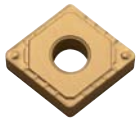
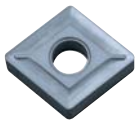
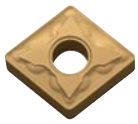
19 Type



Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	CNMG 090404GP	9.525	4.76	3.81	0.4			●						○		○		○	○							95
	CNMG 090408GP				0.8			○						○		○		○	○							188
	CNMG 120402GP	12.70	4.76	5.16	0.2			●					○	●		○		○	○							95
	CNMG 120404GP				0.4	●	●	●			●		○	○		○		○	○							189
	CNMG 120408GP				0.8	●	●	●			●		○	●		○		○	○							
 Finishing	CNGG 120404DP	12.70	4.76	5.16	0.4			●		○																95
	CNGG 120408DP				0.8			●		○																188
 Finishing-Medium	CNMG 090304HQ	9.525	3.18	3.81	0.4			●																		–
	CNMG 090308HQ				0.8			●																		
	CNMG 090404HQ	9.525	4.76	3.81	0.4			○						○		○		○	●							95
	CNMG 090408HQ				0.8			○						○		○		○	●							188
	CNMG 120404HQ	12.70	4.76	5.16	0.4	●	●	●	○		●	●	○	●		○	●	●	●	○						95
	CNMG 120408HQ				0.8	●	●	●	○		●	●	○	●		●	●	●	●	○						189
	CNMG 120412HQ				1.2		○	●				●	○	○		●	●	●	○							

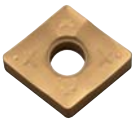
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 80° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	CNMG 120404CQ 120408CQ 120412CQ	12.70	4.76	5.16	0.4 0.8 1.2	● ●		○ ●			● ●		○ ○ ○	○ ○ ●		● ● ●	 ● ●	 ● ●	 ● ●								95 188
	CNMG 160608CQ 160612CQ	15.875	6.35	6.35	0.8 1.2											● ●											95
 Finishing-Medium	CNMP 120404TK 120408TK	12.70	4.76	5.16	0.4 0.8											● ●	● ●	● ●				● ●			● ●		95 189
NEW  Finishing-Medium With Wiper Edge	CNMG 120404WQ 120408WQ 120412WQ	12.70	4.76	5.16	0.4 0.8 1.2	● ● ●		● ● ●			● ● ●	 ● ●	● ● ●		● ● ●	● ● ●											
 Medium	CNMG 120404HK 120408HK	12.70	4.76	5.16	0.4 0.8			○ ○								○ ○				○ ○							
 Medium	CNMG 120404TN-V 120408TN-V	12.70	4.76	5.16	0.4 0.8			○ ○		○ ○																	
 Medium-Roughing	CNMG 090304GS 090308GS	9.525	3.18	3.81	0.4 0.8											● ●										–
	CNMG 090404GS 090408GS	9.525	4.76	3.81	0.4 0.8			○ ○						○ ○		○ ○		○ ○	● ●								95 188
	CNMG 120404GS 120408GS 120412GS	12.70	4.76	5.16	0.4 0.8 1.2				○ ○		● ●		○ ○ ○	● ● ○		○ ○ ○		● ● ○	● ● ○								95 189
 Medium-Roughing	CNMG 120404HS 120408HS 120412HS 120416HS	12.70	4.76	5.16	0.4 0.8 1.2 1.6	● ●	● ○	● ● ● ●	○ ○		● ●	 ○	○ ○ ○	○ ○ ○		○ ○ ○ ●	 ● ● ●	○ ○ ○ ●	○ ○ ○ ●	○ ○ ○ ○		○ ○ ○ ○					95 188
	CNMG 160612HS 160616HS	15.875	6.35	6.35	1.2 1.6											● ●		●	○	○		○ ○					95
 Medium-Roughing	CNMG 190608HS 190612HS 190616HS	19.05	6.35	7.94	0.8 1.2 1.6											○ ●		○ ○	○ ○ ●	○ ○ ○		○ ○ ○					95
 Medium-Roughing	CNMG 120404CS 120408CS 120412CS	12.70	4.76	5.16	0.4 0.8 1.2								○ ○ ○	 ● ○		● ● ●	● ● ●	● ● ●	● ● ●							
 Medium-Roughing / High Feed	CNMG 120408GT 120412GT	12.70	4.76	5.16	0.8 1.2				○					● ○		● ●		● ●	● ●							95 189
 Medium-Roughing / High Feed	CNMG 120408HT 120412HT	12.70	4.76	5.16	0.8 1.2			● ○						● ○		● ●	● ●	● ●	● ●	○						

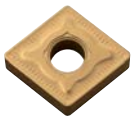
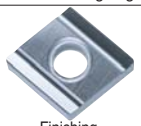
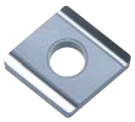
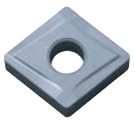
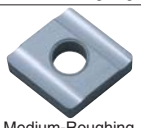
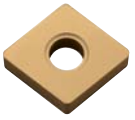
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 80° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Roughing	CNMG 120404 120408 120412 120416	12.70	4.76	5.16	0.4 0.8 1.2 1.6	● ●	○ ●	● ● ●		○ ○ ○		○ ○	○ ○ ○	○ ● ○	● ● ● ●	 ● ● ●	● ● ● ●	○ ○ ○ ○	● ○ ● ○	 ○ ○		○ ○ ○ ○					95 189
	CNMG 160608 160612 160616	15.875	6.35	6.35	0.8 1.2 1.6										● ●	● ●		● ● ●	● ● ●	○		○ ○ ○					95
	CNMG 190608 190612 190616 190624	19.05	6.35	7.94	0.8 1.2 1.6 2.4											○ ●		● ● ○ ○	 ● ○			● ○ ○					95
 Single Sided Roughing / High Feed	CNMM 120408HX 120412HX	12.70	4.76	5.16	0.8 1.2											● ●			● ●			● ○					95 189
	CNMM 160612HX 160616HX	15.875	6.35	6.35	1.2 1.6											● ●			● ●						●		95
	CNMM 190612HX 190616HX 190624HX	19.05	6.35	7.94	1.2 1.6 2.4											● ● ●			● ●			● ○			●		95
 Soft Steel Finishing	CNMG 120404XP 120408XP	12.70	4.76	5.16	0.4 0.8			● ●			● ●	●	○ ○	● ●		○ ○		● ●	● ●								95 189
 Soft Steel Finishing / Tough Edge	CNMG 120404XP-T 120408XP-T	12.70	4.76	5.16	0.4 0.8			○ ○					○ ○	○ ○		○ ○		○ ○	 ○								
 Soft Steel Medium	CNMG 120404XQ 120408XQ	12.70	4.76	5.16	0.4 0.8			● ●			● ●		○ ○	● ●		○ ●		● ○	○ ○								
 Soft Steel Roughing	CNMG 120408XS	12.70	4.76	5.16	0.8			●					○	●		●		●	○								
 Stainless Steel Finishing	CNMG 120404GU 120408GU	12.70	4.76	5.16	0.4 0.8								● ●			● ●			 ○			● ●					
 Stainless Steel Medium-Roughing	CNMG 120408HU 120412HU	12.70	4.76	5.16	0.8 1.2											○ ●	● ●			○		● ●					
 Stainless Steel Medium-Roughing	CNMG 120404SU 120408SU 120412SU	12.70	4.76	5.16	0.4 0.8 1.2												● ● ●										

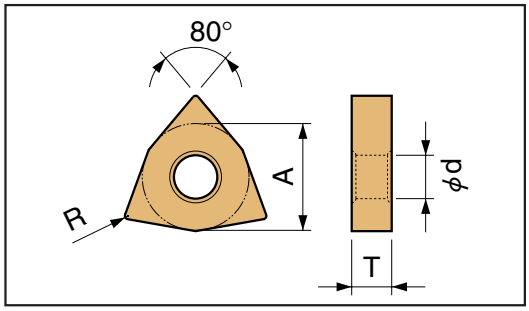
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 80° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
NEW  Cast Iron Roughing	CNMG 120408ZS 120412ZS	12.70	4.76	5.16	0.8 1.2										● ●												
 Cast Iron Roughing	CNMG 120408GC 120412GC	12.70	4.76	5.16	0.8 1.2										● ●			● ●	● ●								95 189
	CNMG 120408GC-R03 120412GC-R03	12.70	4.76	5.16	0.8 1.2												● ●										
 Non-ferrous Metal Medium-Roughing	CNMG 120404AH 120408AH	12.70	4.76	5.16	0.4 0.8																				● ●	
 Finishing Surface Roughness Oriented	CNGG 090402R/L-S 090404R/L-S 090408R/L-S	9.525	4.76	3.81	0.2 0.4 0.8			○ ○ ○						○ ○ ○													95 188
 Medium	CNGG 090404R/L 090408R/L	9.525	4.76	3.81	0.4 0.8			○ ○						○ ○													95 188
	CNGG 120404R/L 120408R/L	12.70	4.76	5.16	0.4 0.8			○ ○																			95 189
 Medium-Roughing	CNGG 120404Z 120408Z	12.70	4.76	5.16	0.4 0.8			○ ○																			95 189
 Medium-Roughing Low Cutting Resistance	CNGG 120404R/L-25R 120408R/L-25R	12.70	4.76	5.16	0.4 0.8			○ ○																		○ ○	
 Stainless Steel Medium-Roughing	CNMG 120404R/L-ST 120408R/L-ST	12.70	4.76	5.16	0.4 0.8													● ●									
 Non-ferrous Metal Finishing-Medium	CNGG 120404R/L-A3 120408R/L-A3	12.70	4.76	5.16	0.4 0.8																				● ●	
 Without Chipbreaker	CNMA 120404 120408 120412 120416	12.70	4.76	5.16	0.4 0.8 1.2 1.6		○ ○					● ● ●			● ● ● ○			● ● ● ●								○ ○	95 189
	CNMA 160612	15.875	6.35	6.35	1.2										●			●									95
	CNMA 190612	19.05	6.35	7.94	1.2													○									95
	CNGA 120404 120408	12.70	4.76	5.16	0.4 0.8					○ ○																○ ○	95 189

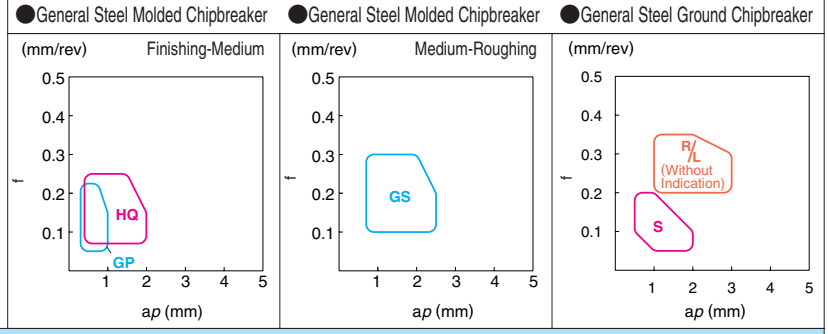
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Hexagon 80° · Negative · with Hole

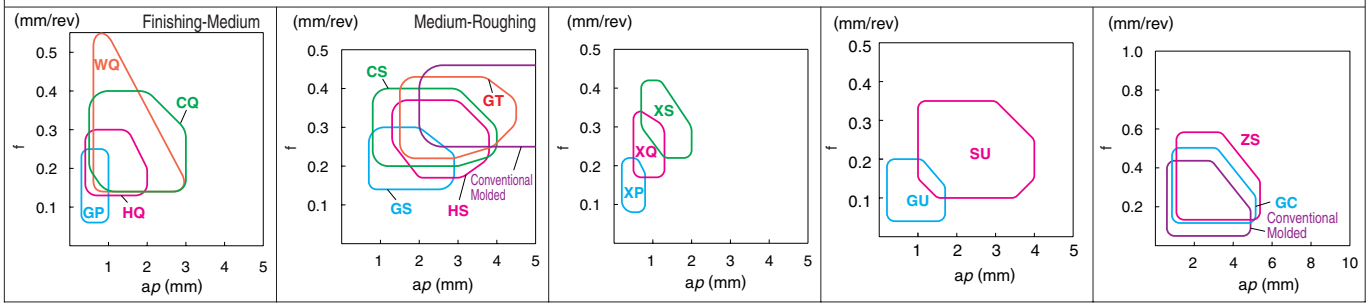


Application Range

06 Type



08 Type



Shape Handed Insert shows Right-hand	Description	Dimension (mm)				Insert Grade																		Ref. Page for Toolholder
						Cermet					PVD Cermet				CVD Coated						PVD Coated						Carbide	
		A	T	ϕd	R	TN6020	TN30	TN60	TN90	TC30	PV7020	PV30	PV60	PV90	CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PR610	PR660	PR905	PR915	PR930	KW10	
 Finishing	WNMG 060404GP 060408GP	9.525	4.76	3.81	0.4 0.8			○ ○						● ●		○ ○		● ●	○ ○							96 190
	WNMG 080404GP 080408GP	12.70	4.76	5.16	0.4 0.8			○ ○					○ ○	○ ●				○ ○								96 191 192
 Finishing-Medium	WNMG 06T304HQ 06T308HQ	9.525	3.97	3.81	0.4 0.8			● ●								○ ○			● ○							–
	WNMG 060404HQ 060408HQ	9.525	4.76	3.81	0.4 0.8			● ●						● ●		○ ○	● ●	● ●	● ●							96 190
	WNMG 080404HQ 080408HQ 080412HQ	12.70	4.76	5.16	0.4 0.8 1.2	● ●		● ● ●	○		● ●	● ●	○ ○ ○	● ● ●		○ ● ○	● ●	○ ○ ○	● ○ ○	○						96 191 192
 Finishing-Medium	WNMG 080404CQ 080408CQ 080412CQ	12.70	4.76	5.16	0.4 0.8 1.2			○ ●					○ ○ ○	○ ○ ●		● ● ●		● ●	○ ○							
 Finishing-Medium	WNMP 080404TK 080408TK	12.70	4.76	5.16	0.4 0.8											● ●	● ●	● ●						● ●		96 191 192
NEW  Finishing-Medium With Wiper Edge	WNMG 06T312WQ	9.525	3.97	3.81	1.2	●		●			●	●		●	●	●										
	WNMG 060412WQ	9.525	4.76	3.81	1.2	●		●			●	●		●	●	●										
	WNMG 080404WQ 080408WQ 080412WQ	12.70	4.76	5.16	0.4 0.8 1.2	● ● ●		● ● ●			● ● ●	● ●		● ● ●		● ● ●										

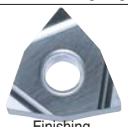
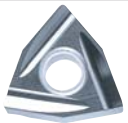
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Hexagon 80° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium-Roughing	WNMG 060404GS 060408GS	9.525	4.76	3.81	0.4 0.8			○ ○						○ ●		● ●	● ●	● ●	○ ●								96 190
	WNMG 080404GS 080408GS 080412GS	12.70	4.76	5.16	0.4 0.8 1.2				●				○ ○ ○	● ● ○		○ ○ ○		● ● ●	● ● ●								96 191 192
 Medium-Roughing	WNMG 080404HS 080408HS 080412HS	12.70	4.76	5.16	0.4 0.8 1.2	● ●		● ● ●			● ●		○ ○ ○	○ ○ ○		○ ○ ○		● ● ○	● ● ●	○ ○		○ ○ ○					96 191 192
 Medium-Roughing	WNMG 080408CS	12.70	4.76	5.16	0.8								○	●		●		●	●								
 Medium-Roughing / High Feed	WNMG 080408GT 080412GT	12.70	4.76	5.16	0.8 1.2									● ○		● ●		● ●	● ●								
 Medium-Roughing / High Feed	WNMG 080408HT 080412HT	12.70	4.76	5.16	0.8 1.2			○ ○						● ○		● ●		● ●	● ○								
 Roughing	WNMG 080404 080408 080412	12.70	4.76	5.16	0.4 0.8 1.2		○ ○	● ○ ○				○ ○			● ● ●	● ● ●	● ● ●	○ ○ ○				○ ○ ○					96 191 192
 Soft Steel Finishing	WNMG 080404XP 080408XP	12.70	4.76	5.16	0.4 0.8			● ●					○ ○	● ●		○ ○		○ ○	● ●								
 Soft Steel Medium	WNMG 080404XQ 080408XQ	12.70	4.76	5.16	0.4 0.8			● ●					○ ○	● ●		○ ●		● ●	● ●								
 Soft Steel Roughing	WNMG 080408XS	12.70	4.76	5.16	0.8			○					○	●		●		●	○								
 Stainless Steel Finishing	WNMG 080404GU 080408GU	12.70	4.76	5.16	0.4 0.8												● ●			○		○ ○					
 Stainless Steel Medium-Roughing	WNMG 080408HU 080412HU	12.70	4.76	5.16	0.8 1.2											●				○		● ●					

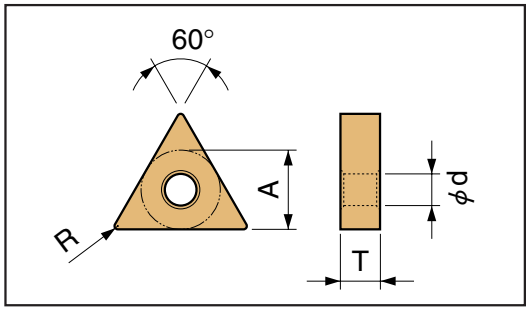
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Hexagon 80° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Stainless Steel Medium-Roughing	**WNMG 080404SU** **080408SU**	12.70	4.76	5.16	0.4 0.8												● ●										96 191 192
NEW  Cast Iron Roughing	**WNMG 080408ZS** **080412ZS**	12.70	4.76	5.16	0.8 1.2										● ●												
 Cast Iron Roughing	**WNMG 080408GC** **080412GC**	12.70	4.76	5.16	0.8 1.2										● ●			● ●									
	WNMG 080408GC-R03 **080412GC-R03**	12.70	4.76	5.16	0.8 1.2												● ●										
 Non-ferrous Metal Medium-Roughing	**WNMG 080404AH** **080408AH**	12.70	4.76	5.16	0.4 0.8																				● ●	
 Finishing Surface Roughness Oriented	**WNGG 060402R/L-S** **060404R/L-S** **060408R/L-S**	9.525	4.76	3.81	0.2 0.4 0.8			R ● ○						○ ● ●													96 190
 Medium	**WNGG 060404R/L** **060408R/L**	9.525	4.76	3.81	0.4 0.8			○ ○						○ ○													
 Medium	**WNMX 080404ER/L** **080408ER/L**	12.70	4.76	3.81	0.4 0.8													● ●									96 191 192
 Without Chipbreaker	**WNMA 080404** **080408** **080412**	12.70	4.76	5.16	0.4 0.8 1.2		○ ○					● ● ●			● ● ●			● ●									

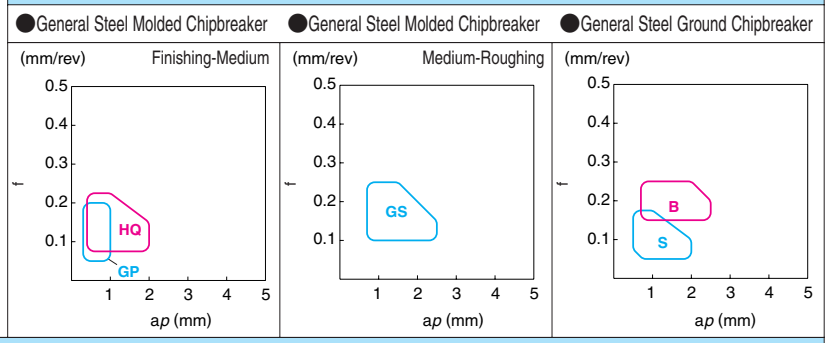
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Negative · with Hole

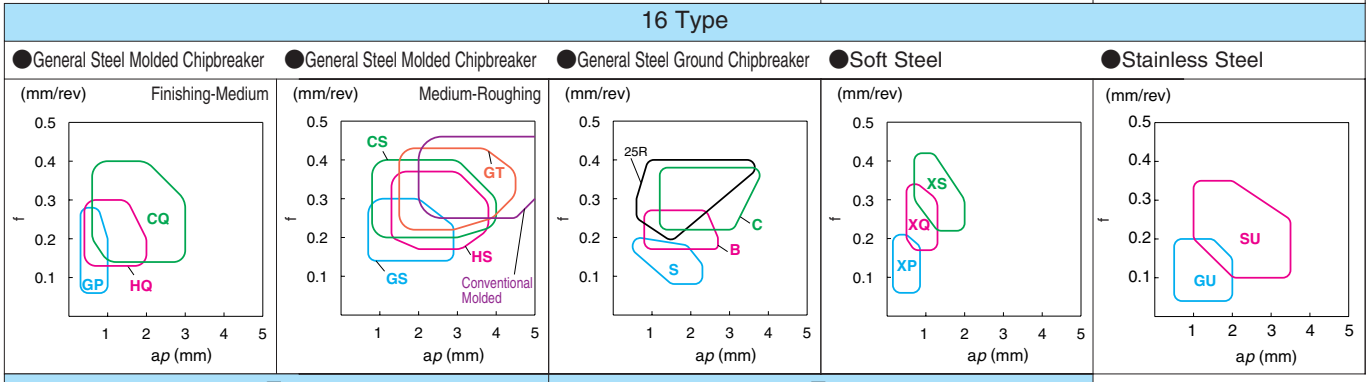


Application Range

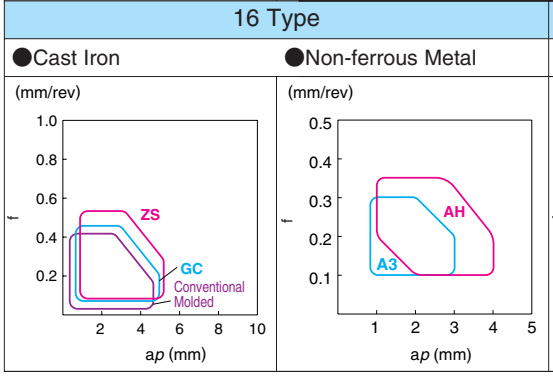
11 Type



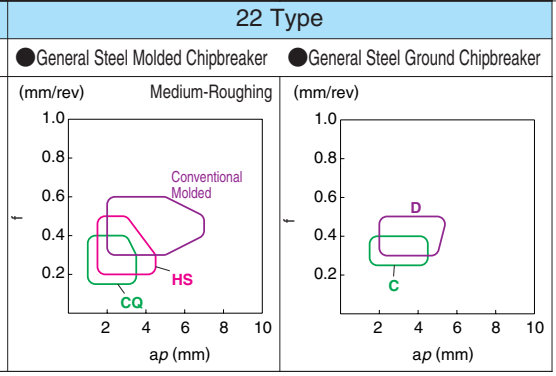
16 Type



16 Type



22 Type



Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	ϕd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	TNMG 110404GP	6.35	4.76	2.26	0.4			○						○		○		○	○								97
	TNMG 110408GP				0.8			○						○		○		○									193
	TNMG 160402GP	9.525	4.76	3.81	0.2	●		●	○		●		○	●		○		○	○								97
	TNMG 160404GP				0.4	●	●	●	○		●		○	●		○		●	○								98
	TNMG 160408GP				0.8	●	●	●	○		●		○	●		○		○	○								194
 Finishing	TNGG 160404DP	9.525	4.76	3.81	0.4					○																	97
	TNGG 160408DP				0.8					○																	98
	TNMG 160404DP	9.525	4.76	3.81	0.4			○																			194
	TNMG 160408DP				0.8			○																			
 Finishing-Medium	TNMG 110404HQ	6.35	4.76	2.26	0.4			○						○		○		○	○								97
	TNMG 110408HQ				0.8			○						○		○		○	○								193
	TNMG 160404HQ	9.525	4.76	3.81	0.4	●	●	●	○		●	●	○	●		○	●	●	●	○							97
	TNMG 160408HQ				0.8	●	●	●	○		●	●	○	●		○	●	○	●	○							98
	TNMG 160412HQ				1.2		●	●					○	●		○		○	○			●					194

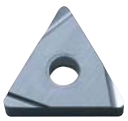
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	TNMG 160404CQ	9.525	4.76	3.81	0.4			●					○	●		●		○									97
	TNMG 160408CQ				0.8	●		●			●		○	●		●		●	○								98
	TNMG 160412CQ				1.2			●					○	●		●		●									194
	TNMG 220408CQ	12.70	4.76	5.16	0.8											●											97
	TNMG 220412CQ				1.2											●											
 Finishing-Medium	TNMP 160404TK	9.525	4.76	3.81	0.4											●	●					●			●		97
	TNMP 160408TK				0.8											●	●					●			●		98 194
 Medium	TNMG 160404HK	9.525	4.76	3.81	0.4			○								○				○							97
	TNMG 160408HK				0.8			○								○				○							98
	TNMG 160412HK				1.2			○																			194
	TNMG 220404HK	12.70	4.76	5.16	0.4			○																			97
	TNMG 220408HK				0.8			●																			
 Medium	TNMG 160404TN-V	9.525	4.76	3.81	0.4					○																	97
	TNMG 160408TN-V				0.8					○																	98 194
 Medium-Roughing	TNMG 110404GS	6.35	4.76	2.26	0.4			○						○		○		○	●								97
	TNMG 110408GS				0.8			○						○		○		○	○								193
	TNMG 160404GS	9.525	4.76	3.81	0.4				○		●		○	●		○		●	●								97
	TNMG 160408GS				0.8				○		●		○	●		○		●	●								98
	TNMG 160412GS				1.2								○	○				○									194
 Medium-Roughing	TNMG 160404HS	9.525	4.76	3.81	0.4	●	○	●	○		●		○	○		○		○	○	○		○					97
	TNMG 160408HS				0.8	●	○	●	○		●		○	○		○		○	○	○		○					98
	TNMG 160412HS				1.2			●					○	○		○		○	○	○		○					194
	TNMG 220404HS	12.70	4.76	5.16	0.4			●								○		○	●	○		○					97
	TNMG 220408HS				0.8			●						○		●		●	●	○		○					98
	TNMG 220412HS				1.2											●		●	●			○					
 Medium-Roughing	TNMG 160404CS	9.525	4.76	3.81	0.4								○			●			○								
	TNMG 160408CS				0.8								○			●		●	●								
 Medium-Roughing / High Feed	TNMG 160408GT	9.525	4.76	3.81	0.8				○					○		●		●	●								97
	TNMG 160412GT				1.2				○					○		●		●	●								98 194
 Medium-Roughing / High Feed	TNMG 160408HT	9.525	4.76	3.81	0.8			○						○		●			○								
	TNMG 160412HT				1.2			○						○		●											
 Roughing	TNMG 160404	9.525	4.76	3.81	0.4	●	○	●		○		○	○	○	●	○	●	○	○	○		○					
	TNMG 160408				0.8	●	○	●		○		○	○	○	●	●	●	○	○	○		○					97
	TNMG 160412				1.2		○	●		○				○	●	○		●	○	○		○					98
	TNMG 160416				1.6										●			●				○					194
	TNMG 160420				2.0										●			○									
	TNMG 220404	12.70	4.76	5.16	0.4					○					●			○				○					
	TNMG 220408				0.8			○							●	●		●	○			●					97
	TNMG 220412				1.2			○							●	●		●	●			●					98
	TNMG 220416				1.6													●									194

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Soft Steel Finishing	TNMG 160404XP 160408XP	9.525	4.76	3.81	0.4 0.8			● ●			● ●		○ ○	● ●		○ ○		○ ●	○ ○								97 98 194
 Soft Steel Finishing / Tough Edge	TNMG 160404XP-T 160408XP-T	9.525	4.76	3.81	0.4 0.8			○ ●					○ ○	○ ○		○ ○		○ ○									
 Soft Steel Medium	TNMG 160404XQ 160408XQ	9.525	4.76	3.81	0.4 0.8			● ●			● ●		○ ○	● ●		● ●		○ ○	○ ○								
 Soft Steel Roughing	TNMG 160408XS	9.525	4.76	3.81	0.8			●					○	○		●		●	○								
 Stainless Steel Finishing	TNMG 160404GU 160408GU	9.525	4.76	3.81	0.4 0.8												● ●			○ ○		○ ○					
 Stainless Steel Medium-Roughing	TNMG 160408HU 160412HU	9.525	4.76	3.81	0.8 1.2											○				○		● ○					
 Stainless Steel Medium-Roughing	TNMG 160404SU 160408SU	9.525	4.76	3.81	0.4 0.8												● ●									
NEW  Cast Iron Roughing	TNMG 160408ZS 160412ZS	9.525	4.76	3.81	0.8 1.2										● ●											
 Cast Iron Roughing	TNMG 160408GC 160412GC	9.525	4.76	3.81	0.8 1.2													● ●								
 Non-ferrous Metal Medium-Roughing	TNMG 160404AH 160408AH	9.525	4.76	3.81	0.4 0.8																				● ●	
 Finishing	TNGG 160404R/L-F1 160408R/L-F1	9.525	4.76	3.81	0.4 0.8					○																

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Negative · with Hole

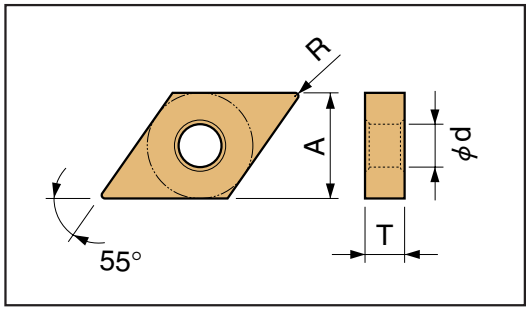
Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing Surface Roughness Oriented	TNGG 110402R/L-S	6.35	4.76	2.26	0.2			○						○													97
	TNGG 110404R/L-S				0.4			L						○													193
	TNGG 110408R/L-S				0.8			○						○													
	TNGG 160402R/L-S	9.525	4.76	3.81	0.2	●	●	○		○	●	○	○	●										○		97
	TNGG 160404R/L-S				0.4	●	●	○		○	●	○	○	●										●		98
	TNGG 160408R/L-S				0.8		●	R		○			○											●		194
 Finishing Sharp Edge / Precision	TNEG 160402R/L-SSF	9.525	4.76	3.81	0.2			○																○		97
	TNEG 160404R/L-SSF				0.4			○																●		98
 Finishing-Medium	TNGG 160404R/L-Y	9.525	4.76	3.81	0.4		○			○																194
	TNGG 160408R/L-Y				0.8		○			L																
 -B: Finishing-Medium -C: Medium-Roughing -D: Roughing	TNGG 110302R/L-B	6.35	3.18	2.26	0.2		●	○																		97
	TNGG 110304R/L-B				0.4		●	○		○																
	TNGG 110308R/L-B				0.8					L																
	TNGG 110402R/L	6.35	4.76	2.26	0.2			○						○												97
	TNGG 110404R/L				0.4			○						○												193
	TNGG 110408R/L				0.8			○						○												
	TNGG 160304R/L-B	9.525	3.18	3.81	0.4			○																		–
	TNGG 160402R/L-B	9.525	4.76	3.81	0.2	●	●	○		○	●	○	○											○	○	97
	TNGG 160404R/L-B				0.4	●	●	○		○	●		○											○		98
	TNGG 160408R/L-B				0.8			○																○		194
	TNGG 160304R/L-C	9.525	3.18	3.81	0.4					R																–
	TNGG 160308R/L-C				0.8					L																
	TNGG 160404R/L-C	9.525	4.76	3.81	0.4	●	○	R		○	R	●	○	○										○	○	97
	TNGG 160408R/L-C				0.8	●	○	○		○	●	○	○	○										○	○	98
	TNGG 160412R/L-C				1.2			○		R																194
	TNGG 160416R/L-C				1.6					R																
	TNMG 160404R/L-C	9.525	4.76	3.81	0.4	●	○	●		○	●	○	○	●												
	TNMG 160408R/L-C				0.8	●	○	●		○	●	○	○	●												
	TNMG 160412R/L-C				1.2			○																		
	TNGG 220404R/L-C	12.70	4.76	5.16	0.4		○	○		○																97
	TNGG 220408R/L-C				0.8		○	○		○																
	TNGG 220412R/L-C				1.2					R																
	TNGG 220408R/L-D	12.70	4.76	5.16	0.8					○																
	TNGG 220412R/L-D				1.2			○																		
 Medium-Roughing Low Cutting Resistance	TNGG 160404R/L-25R	9.525	4.76	3.81	0.4	●	○	●		R	●		○									○		○	●	97
	TNGG 160408R/L-25R				0.8	●	○	○		R	●		○									○		○	○	98
																										194
 Stainless Steel Medium-Roughing	TNMG 160404R/L-ST	9.525	4.76	3.81	0.4			R								●	●	●	●	○		●				97
	TNMG 160408R/L-ST				0.8			●								●	●	●	●	○		R				98
																										194
	TNMG 220404R/L-ST	12.70	4.76	5.16	0.4											●			R							97
	TNMG 220408R/L-ST				0.8											●			R							

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Negative · with Hole

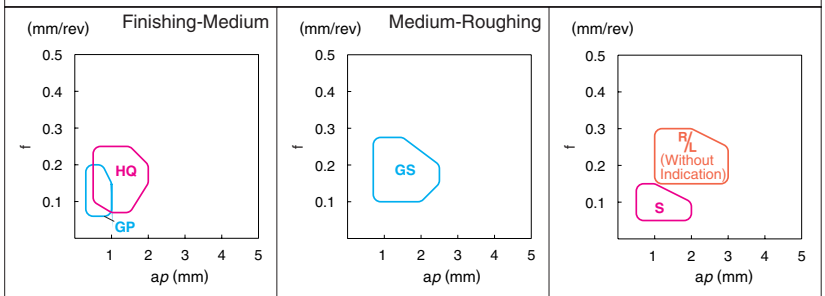
Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Non-ferrous Metal Finishing-Medium	**TNGG 160404R/L-A3** **160408R/L-A3**	9.525	4.76	3.81	0.4 0.8																					R ○	97 98 194
 Without Chipbreaker	**TNMA 160404** **160408** **160412** **160416** **160420**	9.525	4.76	3.81	0.4 0.8 1.2 1.6 2.0		○ ○	○ ○				● ● ●			● ● ● ● ●			● ● ● ● ●									97 98 194
	TNMA 220408 **220412**	12.70	4.76	5.16	0.8 1.2													● ○									97
	TNGA 110304 **110308**	6.35	3.18	2.26	0.4 0.8					○																	97
	TNGA 160404 **160408**	9.525	4.76	3.81	0.4 0.8					○ ○																● ●	97～8 194
	TNGA 220404 **220408**	12.70	4.76	5.16	0.4 0.8					○																	97
 Without Hole Without Chipbreaker	**TNMN 160404** **160408** **160412** **160416** **160420**	9.525	4.76	–	0.4 0.8 1.2 1.6 2.0													○ ○ ○ ○ ○									109
	TNMN 220408	12.70	4.76	–	0.8			●																			–
	TNGN 160308 **160312**	9.525	3.18	–	0.8 1.2			● ●																			–
	TNGN 160404 **160408** **160412**	9.525	4.76	–	0.4 0.8 1.2					○ ○																	109

■ Rhombic 55° · Negative · with Hole

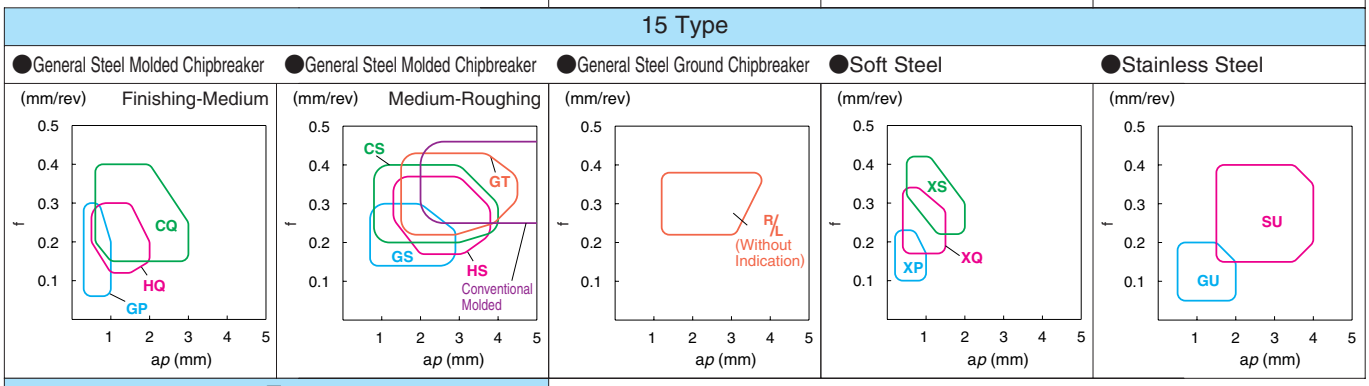


Application Range

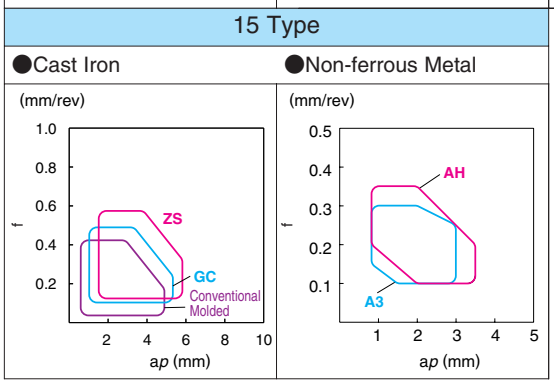
11 Type

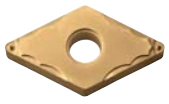
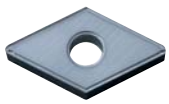


15 Type



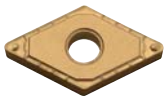
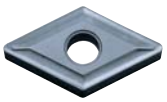
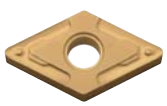
15 Type



Shape Handed Insert shows Right-hand	Description	Dimension (mm) A	T	ϕd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	DNMG 110404GP	9.525	4.76	3.81	0.4			●						●		○		○	○								99
	DNMG 110408GP				0.8			●						○		○		○	○								195
	DNMG 150402GP	12.70	4.76	5.16	0.2	●		●			●		○	●		○		○	○								
	DNMG 150404GP				0.4	●	○	●	○		●		○	○		○		○	○								
	DNMG 150408GP				0.8	●	●	●			●		●	●		○		○	○								99
	DNMG 150602GP	12.70	6.35	5.16	0.2	●					●															
	DNMG 150604GP				0.4	●					●															
	DNMG 150608GP				0.8	●					●															
 Finishing	DNGG 150404DP	12.70	4.76	5.16	0.4			○		○																	99
	DNGG 150408DP				0.8			○		○																	

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 55° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	DNMG 110402HQ	9.525	4.76	3.81	0.2			●						○		○		○	●								99
	DNMG 110404HQ				0.4			●						●		○	●	○	●								195
	DNMG 150404HQ	12.70	4.76	5.16	0.4	●	●	●	○		●	○	○	○		●	○	●	○	○							99
	DNMG 150408HQ				0.8	●	○	●	○		●	○	●	●		●	○	●	○	○							
	DNMG 150412HQ				1.2		●	●	○				○	○		○		○	○								
	DNMG 150604HQ	12.70	6.35	5.16	0.4	●		●			●	●		●			●	●								
	DNMG 150608HQ				0.8	●		●			●	●		●			●	●								
	DNMG 150612HQ				1.2							●						●								
 Finishing-Medium	DNMG 150404CQ	12.70	4.76	5.16	0.4	●		○			●		○	○		○		○	○								
	DNMG 150408CQ				0.8	●		○			●		○	○		●		○	○								
	DNMG 150412CQ				1.2			●					○	○		●		○	○								
	DNMG 150604CQ	12.70	6.35	5.16	0.4	●					●			●		●	●										
	DNMG 150608CQ				0.8	●					●			●		●	●		●								
	DNMG 150612CQ				1.2											●			●								
 Finishing-Medium	DNMP 150604TK	12.70	6.35	5.16	0.4											●	●					●					99
	DNMP 150608TK				0.8											●	●								●		
 Medium	DNMG 150404HK	12.70	4.76	5.16	0.4			○								○				○							
	DNMG 150408HK				0.8			○								○				○							
 Medium	DNMG 150404TN-V	12.70	4.76	5.16	0.4			○		○																	
	DNMG 150408TN-V				0.8			○		○																	
 Medium-Roughing	DNMG 110404GS	9.525	4.76	3.81	0.4			○						○		○		●	○								99
	DNMG 110408GS				0.8			●						●		○	●	●	●								195
	DNMG 150404GS	12.70	4.76	5.16	0.4						●		○	●		○		○	○								
	DNMG 150408GS				0.8				○		●		○	○		○		○	○								
	DNMG 150412GS				1.2								○	○		○		●	○								
	DNMG 150604GS	12.70	6.35	5.16	0.4						●			●				●	●								
	DNMG 150608GS				0.8						●			●				●	●								
	DNMG 150612GS				1.2									●				○									
 Medium-Roughing	DNMG 150404HS	12.70	4.76	5.16	0.4	●	○	●	○		●		○	○		○		○	○	○		○					99
	DNMG 150408HS				0.8	●	○	●			●	○	○	○		○		○	○	○		○					
	DNMG 150412HS				1.2		○	●				○	○	○		○		○	○	○		○					
	DNMG 150604HS	12.70	6.35	5.16	0.4	●		●			●			○		○	●	○	○								
	DNMG 150608HS				0.8	●		●			●			○		○	●	○	○	○							
	DNMG 150612HS				1.2			●						○		○		○	○								
 Medium-Roughing	DNMG 150404CS	12.70	4.76	5.16	0.4								○			○			○								
	DNMG 150408CS				0.8								○			○			●								
	DNMG 150604CS	12.70	6.35	5.16	0.4											●		●									
	DNMG 150608CS				0.8									●		●		●									
 Medium-Roughing / High Feed	DNMG 150408GT	12.70	4.76	5.16	0.8									○		●		●	●								
	DNMG 150412GT				1.2				○					○		○		●	●								
	DNMG 150608GT	12.70	6.35	5.16	0.8									○		●		●	●								
	DNMG 150612GT				1.2									○		●		○	●								

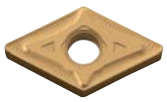
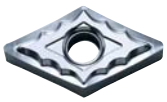
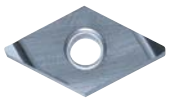
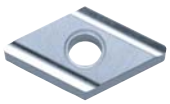
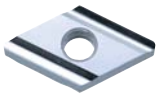
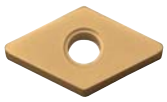
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 55° · Negative · with Hole

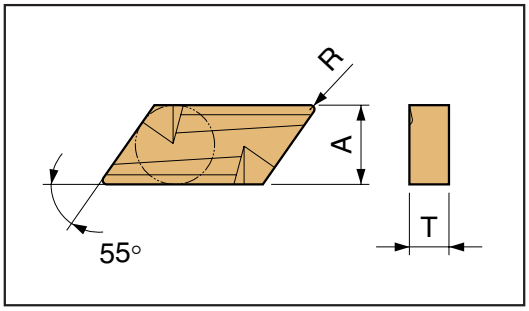
Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium-Roughing / High Feed	DNMG 150408HT 150412HT	12.70	4.76	5.16	0.8 1.2			○ ○						○ ○		○ ○			○								
	DNMG 150608HT 150612HT	12.70	6.35	5.16	0.8 1.2									● ○		● ●		● ●	● ○								
 Roughing	DNMG 150404 150408 150412	12.70	4.76	5.16	0.4 0.8 1.2	● ●	○ ○	● ○				○ ○	○ ○	○ ○ ○	● ● ●	○ ○	○ ○	○ ○ ○	○ ○	○		○ ○ ○					
	DNMG 150604 150608 150612	12.70	6.35	5.16	0.4 0.8 1.2	● ●						● ●				● ●	● ●	○ ○ ○	○ ○ ○	○		○ ○ ○					
 Single Sided Roughing / High Feed	DNMM 150408HX	12.70	4.76	5.16	0.8														○								
	DNMM 150608HX	12.70	6.35	5.16	0.8											●			●								
 Soft Steel Finishing	DNMG 150404XP 150408XP	12.70	4.76	5.16	0.4 0.8			● ●			● ●		○ ○	● ●		○ ○		○ ○	○ ○								
	DNMG 150604XP 150608XP	12.70	6.35	5.16	0.4 0.8			● ●			● ●			● ●													
 Soft Steel Finishing / Tough Edge	DNMG 150404XP-T 150408XP-T	12.70	4.76	5.16	0.4 0.8			○ ○					○ ○	○ ○		○ ○		○ ○									99
 Soft Steel Medium	DNMG 150404XQ 150408XQ	12.70	4.76	5.16	0.4 0.8			● ●			● ●		○ ○	● ●		○ ●		○ ●	○ ○								
	DNMG 150604XQ 150608XQ	12.70	6.35	5.16	0.4 0.8			● ●			● ●			● ●		● ●											
 Soft Steel Roughing	DNMG 150408XS	12.70	4.76	5.16	0.8			●					○	○		○		○	○								
	DNMG 150608XS	12.70	6.35	5.16	0.8											●		●									
 Stainless Steel Finishing	DNMG 150404GU 150408GU	12.70	4.76	5.16	0.4 0.8												○ ○		○ ○	○ ○		○ ○					
	DNMG 150604GU 150608GU	12.70	6.35	5.16	0.4 0.8												● ●										
 Stainless Steel Medium-Roughing	DNMG 150408HU 150412HU	12.70	4.76	5.16	0.8 1.2											○				○		○ ○					
	DNMG 150608HU 150612HU	12.70	6.35	5.16	0.8 1.2																	● ●					
 Stainless Steel Medium-Roughing	DNMG 150404SU 150408SU	12.70	4.76	5.16	0.4 0.8												● ○										
	DNMG 150604SU 150608SU	12.70	6.35	5.16	0.4 0.8												● ●										
NEW  Cast Iron Roughing	DNMG 150408ZS 150412ZS	12.70	4.76	5.16	0.8 1.2										● ●												

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 55° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Cast Iron Roughing	DNMG 150408GC 150412GC	12.70	4.76	5.16	0.8 1.2													○ ○									99
	DNMG 150608GC 150612GC	12.70	6.35	5.16	0.8 1.2													● ●									
 Non-ferrous Metal Medium-Roughing	DNMG 150404AH 150408AH	12.70	4.76	5.16	0.4 0.8																				○ ○	
	DNMG 150604AH 150608AH	12.70	6.35	5.16	0.4 0.8																				● ●	
 Finishing Surface Roughness Oriented	DNGG 110402R/L-S 110404R/L-S 110408R/L-S	9.525	4.76	3.81	0.2 0.4 0.8			○ ○ ○						○ ● ●												99 195
 Medium	DNGG 110404R/L 110408R/L	9.525	4.76	3.81	0.4 0.8			○ ○						○ R												99 195
	DNGG 150404R/L 150408R/L	12.70	4.76	5.16	0.4 0.8	● ●	○ ○	● R		○ ○	○ ○		○ ○	○ ○										○ ○	R R	99
 Stainless Steel Medium-Roughing	DNMG 150404R/L-ST 150408R/L-ST	12.70	4.76	5.16	0.4 0.8												○ R		R	○ R						
	DNMG 150604R/L-ST 150608R/L-ST	12.70	6.35	5.16	0.4 0.8										● ●	● ●	● ●	● ●	● ●							
 Non-ferrous Metal Finishing-Medium	DNGG 150404R/L-A3 150408R/L-A3	12.70	4.76	5.16	0.4 0.8																				● ●	99
 Without Chipbreaker	DNMA 150404 150408	12.70	4.76	5.16	0.4 0.8		○ ○					○			●			○ ○								○ ○	
	DNMA 150604 150608	12.70	6.35	5.16	0.4 0.8							● ●			●											
	DNGA 150404 150408	12.70	4.76	5.16	0.4 0.8					○ ○																

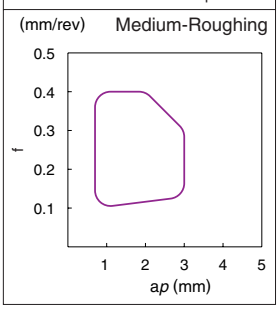
■ Parallelogram 55° · Negative · without Hole

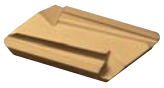


Application Range

16 Type

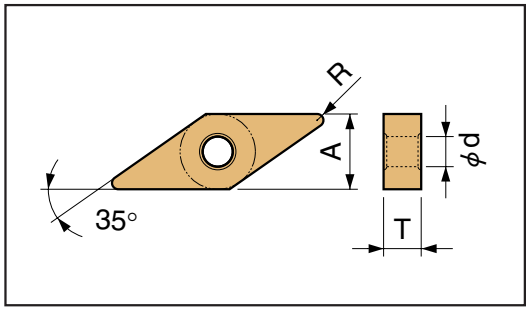
●General Steel Ground Chipbreaker



Shape Handed Insert shows Right-hand	Description	Dimension (mm)				Insert Grade																		Ref. Page for Toolholder
						Cermet					PVD Cermet				CVD Coated						PVD Coated					Carbide	
		A	T	ϕd	R	TN6020	TN30	TN60	TN90	TC30	PV7020	PV30	PV60	PV90	CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PR610	PR660	PR905	PR915	PR930	KW10	
 Medium-Roughing	**KNMX 160405R/L-1** **160410R/L-1**	9.525	4.76	–	0.5 1.0											L ○			● R ● R							–

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

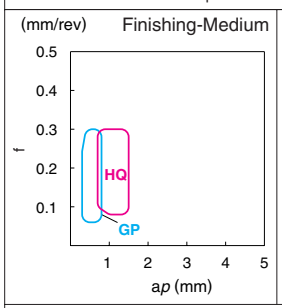
■ Rhombic 35° · Negative · with Hole



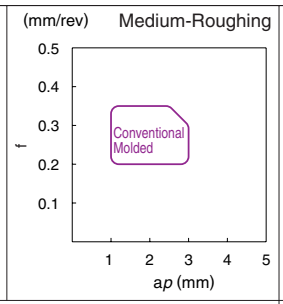
Application Range

16 Type

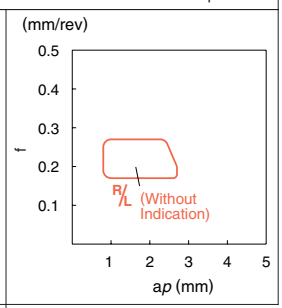
●General Steel Molded Chipbreaker



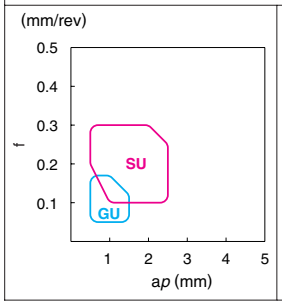
●General Steel Molded Chipbreaker



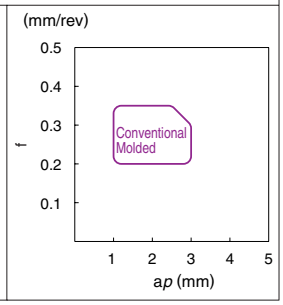
●General Steel Ground Chipbreaker

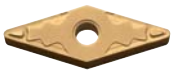


●Stainless Steel



●Cast Iron

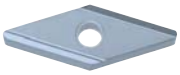
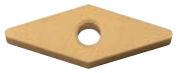


Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	ϕd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	VNMG 160402GP 160404GP 160408GP	9.525	4.76	3.81	0.2 0.4 0.8	● ● ●	 ● ●	● ● ●	○ ○		● ● ●		○ ○ ○	● ● ●		○ ○ ○		○ ○ ○	○ ● ○								100 101
 Finishing	VNMG 160404DP 160408DP	9.525	4.76	3.81	0.4 0.8			○ ○		○ ○																	
 Medium	VNMG 160404HQ 160408HQ 160412HQ	9.525	4.76	3.81	0.4 0.8 1.2	● ●		● ● ●	○		● ●		○ ○ ○	● ● ○		● ● ●	● ● 	● ● ●	● ● 								
 Medium	VNMG 160404TN-V 160408TN-V 160412TN-V	9.525	4.76	3.81	0.4 0.8 1.2			○ ○ ○		○ ○ ○																	
 Roughing	VNMG 160404 160408	9.525	4.76	3.81	0.4 0.8	● ●	● ○	● ●			● ●	○ ○	○ ○	● ●	● ●	● ●	● ●	○ ○	○ ○	○ ○							
 Soft Steel Finishing	VNMG 160404XP	9.525	4.76	3.81	0.4			●	●					●											●		

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

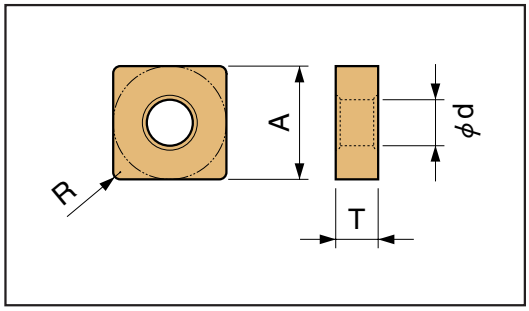
Turning Indexable Inserts [Cermet · Coated · Carbide]

■ Rhombic 35° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Stainless Steel Finishing	**VNMG 160404GU** **160408GU**	9.525	4.76	3.81	0.4 0.8												● ●		○ ○	○		○ ○						100 101
 Stainless Steel Medium-Roughing	**VNMG 160404SU** **160408SU**	9.525	4.76	3.81	0.4 0.8												● ●										
 Medium	**VNGG 160402R/L** **160404R/L** **160408R/L**	9.525	4.76	3.81	0.2 0.4 0.8	○ ○	○ ○	○ ○ ○		○ ○	○ ○	○ ○	○ ○	○ ○ ○											R ● ○	○ ○	
 Without Chipbreaker	**VNGA 160404** **160408**	9.525	4.76	3.81	0.4 0.8					○ ○																● ○	

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

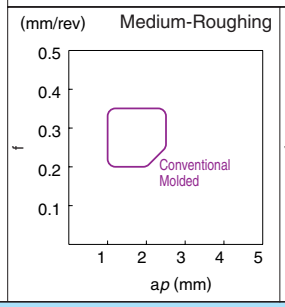
■ Square 90° · Negative · with Hole



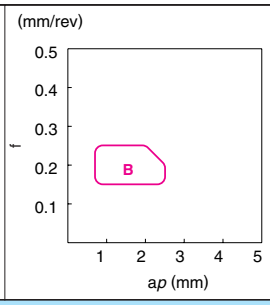
Application Range

09 Type

●General Steel Molded Chipbreaker

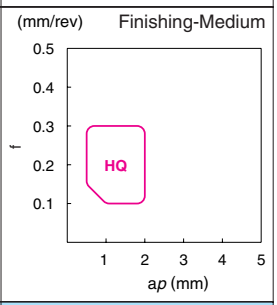


●General Steel Ground Chipbreaker



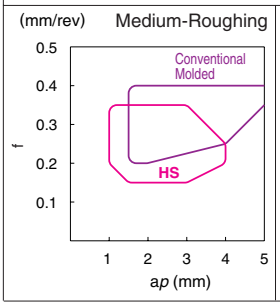
12 Type

●General Steel Molded Chipbreaker

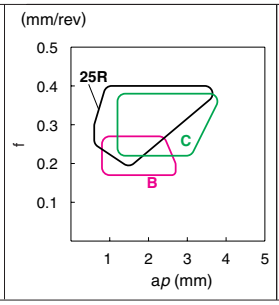


12 Type

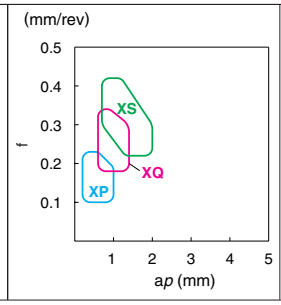
●General Steel Molded Chipbreaker



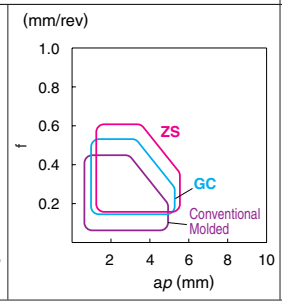
●General Steel Ground Chipbreaker



●Soft Steel

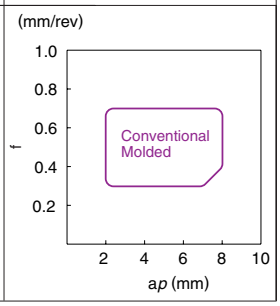


●Cast Iron



19 Type

●General Steel Molded Chipbreaker



Shape Handed Insert shows Right-hand	Description	Dimension (mm)				Insert Grade																			Ref. Page for Toolholder
						Cermet					PVD Cermet				CVD Coated						PVD Coated					Carbide	
		A	T	ϕd	R	TN6020	TN30	TN60	TN90	TC30	PV7020	PV30	PV60	PV90	CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PR610	PR660	PR905	PR915	PR930	KW10	
 Finishing	**SNGG 120404DP** **120408DP**	12.70	4.76	5.16	0.4 0.8					○ ○																102 103
 Finishing-Medium	**SNMG 120404HQ** **120408HQ** **120412HQ**	12.70	4.76	5.16	0.4 0.8 1.2	● ●	○ ○ ●	● ● ●			● ●	○ ○	○ ● ●	○ ○ ○	● ● ●	● ● ●	○ ● ●	○ ● ○	● ○ ○	○ ○ ○							
 Medium	**SNMG 120404HK** **120408HK** **120412HK**	12.70	4.76	5.16	0.4 0.8 1.2			○ ○ ○																		
 Medium	**SNMG 120404TN-V** **120408TN-V** **120412TN-V**	12.70	4.76	5.16	0.4 0.8 1.2					- ○ -																
 Medium-Roughing	**SNMG 120408HS** **120412HS** **120416HS**	12.70	4.76	5.16	0.8 1.2 1.6			● ● ○					○ ○	○ ○		● ● ○		○ ○ ○	● ○ ○	○ ○							
 Medium-Roughing / High Feed	**SNMG 120408HT** **120412HT**	12.70	4.76	5.16	0.8 1.2			○ ○						○ ○		○			● ●							

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

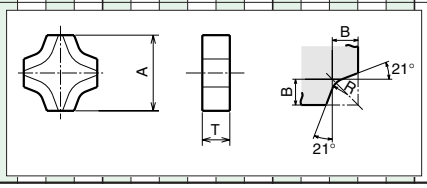
■ Square 90° · Negative · with Hole

Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Roughing	SNMG 090304 090308	9.525	3.18	3.81	0.4 0.8			● ●								○ ○			○ ○								
	SNMG 120404 120408 120412 120416 120420	12.70	4.76	5.16	0.4 0.8 1.2 1.6 2.0	● ●	○ ○ ○ ○	● ● ● ○ ○		○ ○ ○ ○			○ ○ ○	● ○ ○ ○	● ● ● ●	● ● ●	● ○ ○ ○ ○	○ ○ ○									102 103
	SNMG 190612 190616	19.05	6.35	7.94	1.2 1.6											● ●		● ●	○							–
 Single Sided Roughing / High Feed	SNMM 190612HX 190616HX	19.05	6.35	7.94	1.2 1.6												● ●		● ●		● ●						–
 Soft Steel Finishing	SNMG 120408XP	12.70	4.76	5.16	0.8			●					●	●		○		●	○								102 103
 Soft Steel Medium	SNMG 120408XQ	12.70	4.76	5.16	0.8			●					○	●		●		●									
 Soft Steel Roughing	SNMG 120408XS	12.70	4.76	5.16	0.8			○					○	●		●		●	○								
NEW  Cast Iron Roughing	SNMG 120408ZS 120412ZS	12.70	4.76	5.16	0.8 1.2										● ●												
 Cast Iron Roughing	SNMG 120408GC 120412GC	12.70	4.76	5.16	0.8 1.2													● ●									
 Finishing-Medium	SNGG 120404R/L-Y 120408R/L-Y	12.70	4.76	5.16	0.4 0.8					○ -																	
 -B: Finishing-Medium -C: Medium-Roughing	SNGG 090304R/L-B 090308R/L-B	9.525	3.18	3.81	0.4 0.8		● R	○ ○		○ ○																	
	SNGG 120404R/L-B 120408R/L-B	12.70	4.76	5.16	0.4 0.8					L																	
	SNGG 120404R/L-C 120408R/L-C 120412R/L-C	12.70	4.76	5.16	0.4 0.8 1.2		○ ○	○ ○		○ ○ L				○ ○													
	SNMG 120404R/L-C 120408R/L-C	12.70	4.76	5.16	0.4 0.8			○ R																			

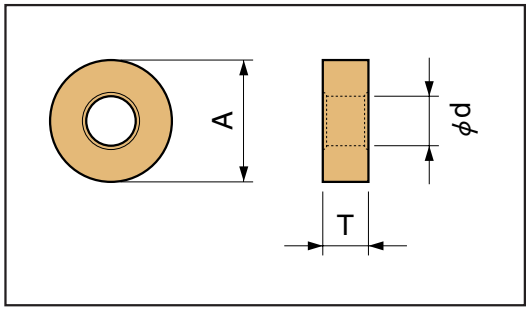
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Square 90° · Negative · with Hole

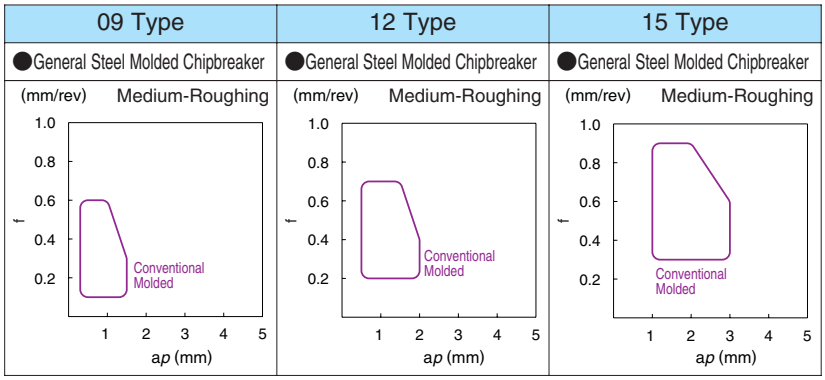
Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium-Roughing Low Cutting Resistance	**SNGG 120404R/L-25R**	12.70	4.76	5.16	0.4			○																			102
	120408R/L-25R				0.8			○																			
 Stainless Steel Medium-Roughing	**SNMG 120408R/L-ST**	12.70	4.76	5.16	0.8														●								
 Without Chipbreaker	**SNMA 120404**	12.70	4.76	5.16	0.4		○											○									103
	120408				0.8		○								●			●									
	120412				1.2										●			○									
	120416				1.6										●			○									
	120420				2.0										●			○									
	SNGA 090304	9.525	3.18	3.81	0.4																				●	
	090308				0.8																				●	
	SNGA 120404	12.70	4.76	5.16	0.4																					
	120408				0.8					○																
	120412				1.2					○																
 Without Hole Without Chipbreaker	**SNMN 120408**	12.70	4.76	–	0.8													○									112
	120412				1.2													○									113
	120416				1.6													○									
	SNGN 120408	12.70	4.76	–	0.8					○																	198
	120412				1.2					○																	453
	120416				1.6					○																	454
	120420				2.0					○																	
	SNGN 150416	15.875	4.76	–	1.6				●																		–
		A	T	B	R																						
 Bearing Machining	**SNMF 120406-21**	12.70	4.76	1.5	0.6				●																		107
	120410-21			3.0	1.0				●																		
	120416-21			3.1	1.6				●																		196
	120421-21			3.2	2.1				●																		
	120426-21			3.3	2.6				●																		



■ Round · Negative · with Hole

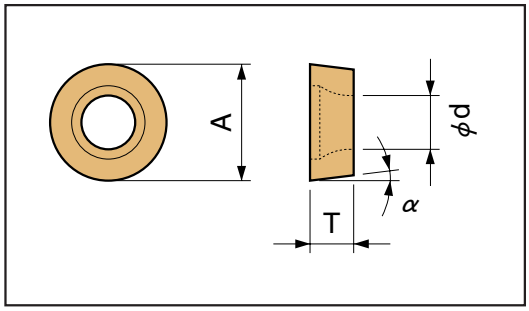


Application Range

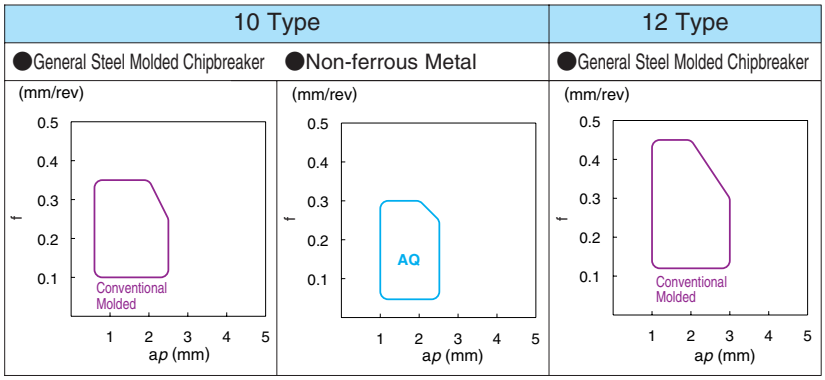


Shape	Description	Dimension (mm) A	T	ϕd	R	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium-Roughing	**RNMG 090300**	9.525	3.18	3.8	–			●		○						○			○								104
	RNMG 120400	12.70	4.76	5.16	–			●		○						●			○								
	RNMG 150600	15.875	6.35	6.35	–											○											–

■ Round · Positive · with Hole



Application Range

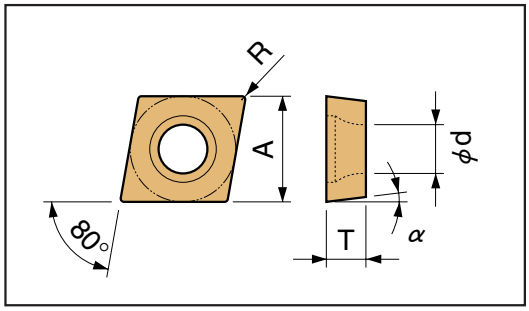


Shape	Description	Dimension (mm) A	T	ϕd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium	**RCMX 1003M0**	10.0	3.18	3.6	–	7°		●	●								○	●	●	●	○		○					105
	RCMX 1204M0	12.0	4.76	4.2	–	7°		○	●								○	●	○	●	○		●					
 Non-ferrous Metal Finishing-Medium	**RCGX 1003M0-AQ**	10.0	3.18	3.6	–	7°																					○	
 Bearing Machining	**RCMT 1204M0-BB**	12.0	4.76	4.2	–	7°				●																		106
	1606M0-BB	16.0	6.35	5.5						●																		
	RPMT 1203M0-BB	12.0	3.18	4.2	–	11°				●																		196
	1604M0-BB	16.0	4.76	5.5						●																		

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

Turning Indexable Inserts [Cermet · Coated · Carbide]

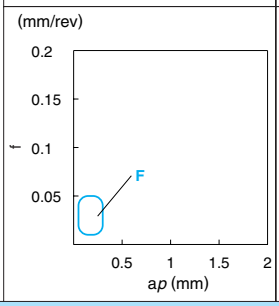
■ Rhombic 80° · Positive · with Hole



Application Range

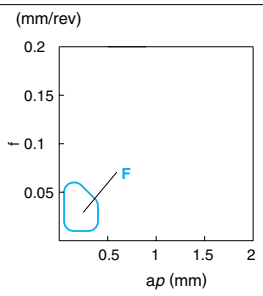
03 Type

●General Steel Ground Chipbreaker



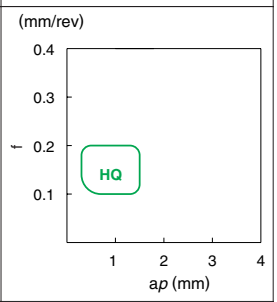
04 Type

●General Steel Ground Chipbreaker



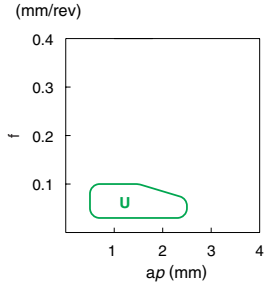
06 Type

●General Steel Molded Chipbreaker



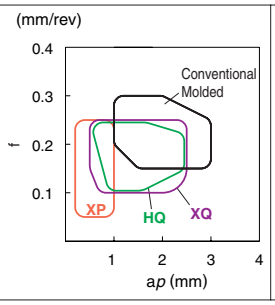
06 Type

●General Steel Ground Chipbreaker

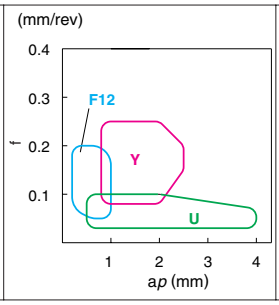


08/09 Type

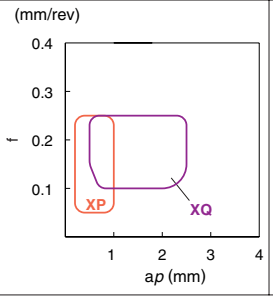
●General Steel Molded Chipbreaker



●General Steel Ground Chipbreaker

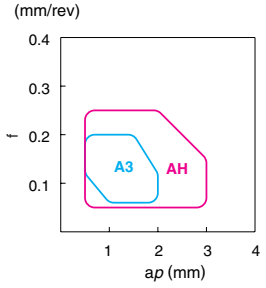


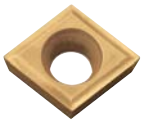
●Soft Steel



09/12 Type

●Non-ferrous Metal

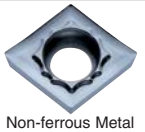
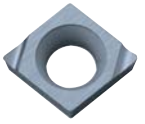
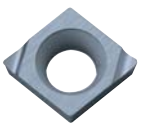
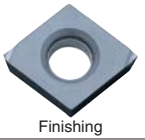
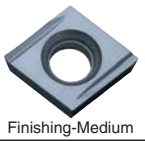


Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	ϕd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	CPMT 080204GP	7.94	2.38	3.3	0.4	11°			○			●		○	●		○		○	○						○		162 164
	CPMT 090304GP 090308GP	9.525	3.18	4.5	0.4 0.8	11°	●		○ ●			● ●		○ ○	● ●		● ○		○ ○	○ ●						○ ○		
 Finishing-Medium	CCMT 060202HQ 060204HQ	6.35	2.38	2.8	0.2 0.4	7°	● ●	○ ●	● ●			● ●		○ ○	● ●		○ ●	● ●	● ●	● ●	○ ○		○ ●				● ●		130~1 162,164
	CCMT 09T302HQ 09T304HQ 09T308HQ	9.525	3.97	4.4	0.2 0.4 0.8	7°	● ● ●	○ ● ●	● ● ●			● ● ●		○ ○ ○	● ● ●		● ● ●	● ● ●	● ● ●	● ● ●	○ ○ ○		○ ○ ○				● ● ●		130 131 164
 Finishing-Medium	CPMH 080204HQ 080208HQ	7.94	2.38	3.5	0.4 0.8	11°	● ●		● ●			● ●		○ ○	○ ○		○ ○	● ●	○ ○	● ○	○ ○		○ ○				● ●		162
	CPMH 090304HQ 090308HQ	9.525	3.18	4.5	0.4 0.8	11°	● ●	● ○	● ●			● ●	○ ○	○ ○	● ●		○ ○	● ●	○ ○	● ●	○ ○		○ ○				○ ○		164
 Medium	CCGT 060201 060202 060204	6.35	2.38	2.8	0.1 0.2 0.4	7°	● ● ●	● ● ●	● ● ●			● ● ●		○ ○ ○	○ ● ●												○ ● ●		130~1 162,164
	CCGT 09T301 09T302 09T304	9.525	3.97	4.4	0.1 0.2 0.4	7°	● ● ●	● ● ●	● ● ●			● ● ●		○ ○ ○	● ● ●												● ● ●		130 131 164
	CCMT 09T308	9.525	3.97	4.4	0.8	7°			●					○	○		●	●	●	○	○						●		
 Medium	CPMH 080204 080208	7.94	2.38	3.5	0.4 0.8	11°	● ●		● ●	○ ○		● ●		○ ○	○ ○		○ ○	● ●	○ ○	○ ○	○ ○		○ ○				○ ○		162
	CPMH 090304 090308	9.525	3.18	4.5	0.4 0.8	11°	● ●	○ ○	● ●	○ ○		● ●	○ ○	○ ○	○ ○		○ ●	● ●	○ ○	● ●	○ ○		○ ○				○ ○		164

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

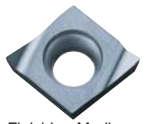
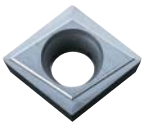
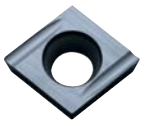
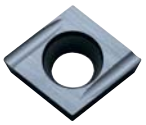
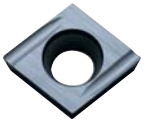
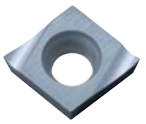
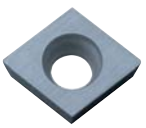
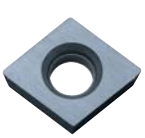
Turning Indexable Inserts

■ Rhombic 80° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium	**CCMT 060204GK**	6.35	2.38	2.8	0.4	7°	●		●			●			●			●							●	●		130~1 162,164
	CCMT 09T304GK	9.525	3.18	4.4	0.4	7°	●		●			●			●			●							●	●		130 131 164
 Medium	**CCMT 09T304HF**	9.525	3.97	4.4	0.4	7°			●						●		●						●					130 131 164
 Medium	**CCMT 120408FG**	12.70	4.76	5.5	0.8	7°									●				●	●								131
 Soft Steel Finishing	**CPMT 080204XP**	7.94	2.38	3.3	0.4	11°						●		○	○		○									○		
	CPMT 090304XP **090308XP**	9.525	3.18	4.5	0.4 0.8	11°						● ●		○ ○	○ ○		● ○									● ○		162 164
 Soft Steel Finishing-Medium	**CPMT 090304XQ** **090308XQ**	9.525	3.18	4.5	0.4 0.8	11°						● ●		○ ○	● ●		● ●			○ ○								
NEW  Non-ferrous Metal Finishing-Medium	**CCGT 09T304AH** **09T308AH**	9.525	3.97	4.5	0.4 0.8	7°																				● ●	130 131 164
 Finishing	**CCGT 0301003R/L-F** **030101R/L-F** **030102R/L-F** **030104R/L-F**	3.5	1.4	1.9	0.03 0.1 0.2 0.4	7°	L L		● L ● ●			L L		L L	L L							● L L				○ ● ● ●	L ●	
	CCGT 0401003R/L-F **040101R/L-F** **040102R/L-F** **040104R/L-F**	4.3	1.8	2.3	0.03 0.1 0.2 0.4	7°	L L		○ ● ●			L L		L L	L L							L				○ ○ ● ●	○ ● ○	160
Super Fine  Finishing Sharp Edge / Precision	**CCET 0301003R/L-FSF** **030101R/L-FSF** **030102R/L-FSF** **030104R/L-FSF**	3.5	1.4	1.9	0.03 0.1 0.2 0.4	7°			○ R ○																○ ○ ● ○		161
	CCET 0401003R/L-FSF **040101R/L-FSF** **040102R/L-FSF** **040104R/L-FSF**	4.3	1.8	2.3	0.03 0.1 0.2 0.4	7°			○ ● ○																○ ○ ● L		
 Finishing	**CPMH 080204R/L-F12** **080208R/L-F12**	7.94	2.38	3.5	0.4 0.8	11°																						
	CPMH 090304R/L-F12 **090308R/L-F12**	9.525	3.18	4.5	0.4 0.8	11°					L ○																	162
 Finishing-Medium	**CPMH 080204R/L-Y** **080208R/L-Y**	7.94	2.38	3.5	0.4 0.8	11°	L		● ○			L			○ ○											○ ○	● ○	164
	CPMH 090304R/L-Y **090308R/L-Y**	9.525	3.18	4.5	0.4 0.8	11°	L		● ○			L			○ ○											○ ○	○ ○	

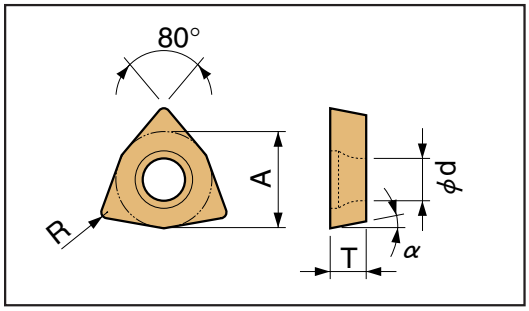
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 80° · Positive · with Hole

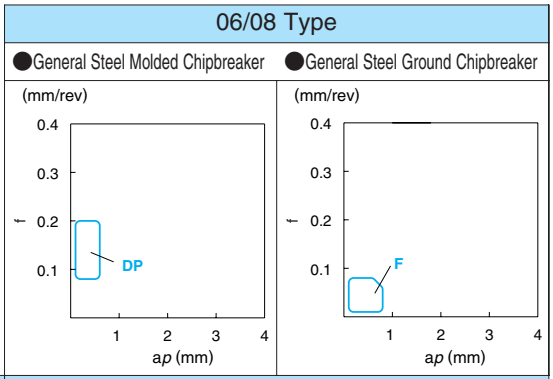
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	CCGT 060202R/L-FS	6.35	2.38	2.8	0.2	7°			●																			130~1
	CCGT 060204R/L-FS				0.4				●																	●		162,164
	CCGT 09T302R/L-FS	9.525	3.97	4.5	0.2	7°			●																		●	130
	CCGT 09T304R/L-FS				0.4				●																		●	131
	CCGT 09T308R/L-FS				0.8				●																			164
 Medium	CCGT 060202FN-Z	6.35	2.38	2.8	0.2	7°			●																	●		130~1
	CCGT 060204FN-Z				0.4				●																	●		162,164
	CCGT 09T302FN-Z	9.525	3.97	4.5	0.2	7°			●																	●		130
	CCGT 09T304FN-Z				0.4				●																	●		131
	CCGT 09T308FN-Z				0.8				●																	●		164
 Low Feed / Sharp Edge	CCGT 0602003FR/L-U	6.35	2.38	2.8	0.03	7°			○																	○	○	130~1
	CCGT 060201FR/L-U				0.1			R	●				○	○												○	●	162
	CCGT 060202FR/L-U				0.2			R	●				○	○	●							L				L	●	164
	CCGT 09T3003FR/L-U	9.525	3.97	4.4	0.03	7°			○																	○	○	130
	CCGT 09T301FR/L-U				0.1			●	●				R									R				○	●	131
	CCGT 09T302FR/L-U				0.2			●	●				R									R				○	●	164
Super Fine  Low Feed Sharp Edge / Precision	CCET 0602003FR/L-USF	6.35	2.38	2.8	0.03	7°			R																	○		130~1
	CCET 060201FR/L-USF				0.1				○																	○		162
	CCET 060202FR/L-USF				0.2				○																	●		164
	CCET 09T3003FR/L-USF	9.525	3.97	4.4	0.03	7°			R																	○		130
	CCET 09T301FR/L-USF				0.1				○																	○		131
	CCET 09T302FR/L-USF				0.2				○																	L		164
 Low Feed / With Honing	CCGT 060201ER/L-U	6.35	2.38	2.8	0.1	7°			○																	○		130~1
	CCGT 060202ER/L-U				0.2			○	○				○	○	L											○		162
	CCGT 060204ER/L-U				0.4				○					○	L											L		164
	CCGT 09T301ER/L-U	9.525	3.97	4.4	0.1	7°		R	●				○													○		130
	CCGT 09T302ER/L-U				0.2			R	●				○													R		131
	CCGT 09T304ER/L-U				0.4			○	●				○													●		164
 Non-ferrous Metal Finishing-Medium	CCGT 09T302R/L-A3	9.525	3.97	4.4	0.2	7°																				●	130
	CCGT 09T304R/L-A3				0.4																					●	131
	CCGT 09T308R/L-A3				0.8																					○	164
	CCGT 120402R/L-A3	12.70	4.76	5.5	0.2	7°																				○	
	CCGT 120404R/L-A3				0.4																					○	131
	CCGT 120408R/L-A3				0.8																					○	
 Without Chipbreaker	CCGW 060201	6.35	2.38	2.8	0.1	7°																				●	130~1
	CCGW 060202				0.2																					○	162,164
	CCGW 09T301	9.525	3.97	4.4	0.1	7°																				●	130
	CCGW 09T302				0.2																					○	131
	CCGW 09T304				0.4																					●	164
 Without Chipbreaker	CPMB 080202	7.94	2.38	3.5	0.2	11°																				○	
	CPMB 080204				0.4																					○	
	CPMB 080208				0.8																					○	162
	CPMB 090302	9.525	3.18	4.5	0.2	11°																				○	164
	CPMB 090304				0.4																					○	
	CPMB 090308				0.8																					○	

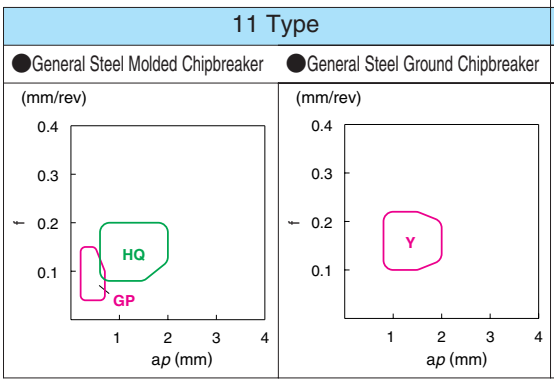
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

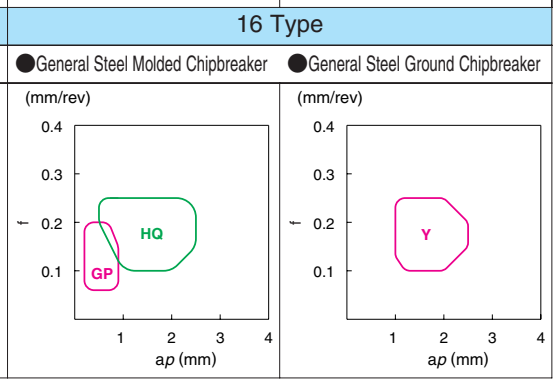
■ Hexagon 80° · Positive · with Hole

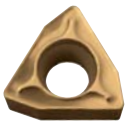
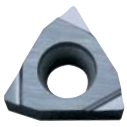


Application Range



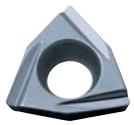




Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	ϕd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	WPMT 110204GP	6.35	2.38	2.8	0.4	11°			○					○	●				○							○		169
	WPMT 160304GP	9.525	3.18	4.4	0.4	11°			○					○	●				○	○						○		170
 Finishing	WBMT 060102R/L-DP	3.97	1.59	2.3	0.2	5°			●					L			L			●	L				●		167
	060104R/L-DP				0.4				●					L			L			●	L				L		168
	WBMT 080202R/L-DP	4.76	2.38	2.3	0.2	5°			●					L			○			●	L				●		167
	080204R/L-DP				0.4				●					L			○			●	L				●		~169
 Finishing-Medium	WPMT 110202HQ	6.35	2.38	2.8	0.2	11°			●					○	●		●		●	●	○		○		●		
	110204HQ				0.4		●		●			○		○	○		●	●	●	●	○		○		●		169
	WPMT 160304HQ	9.525	3.18	4.4	0.4	11°	●		●			●		●	●		●	●	●	●	○		○		●		170
	160308HQ				0.8				●					●	●		●	●	●	●	○		○		●		
 Finishing	WBGT 0601003R/L-F	3.97	1.59	2.3	0.03	5°			L																●	L	
	060101R/L-F				0.1				●																○	○	167
	060102R/L-F				0.2		L	L	●			L	○	L	●							L			●	●	168
	060104R/L-F				0.4		●	○	●			●	○	L	L							L			L	●	
	WBGT 0802003R/L-F	4.76	2.38	2.3	0.03	5°																			●		
	080201R/L-F				0.1				○																○	○	167
	080202R/L-F				0.2		L	○	●			L	○	L	L							L			○	●	~169
	080204R/L-F				0.4		●	○	●			●	○	L	L							L			○	●	
Finishing	WCGT 020101R/L-F	3.97	1.59	2.3	0.1	7°			L																		
	020102R/L-F				0.2				●																		–
	020104R/L-F				0.4				●																		

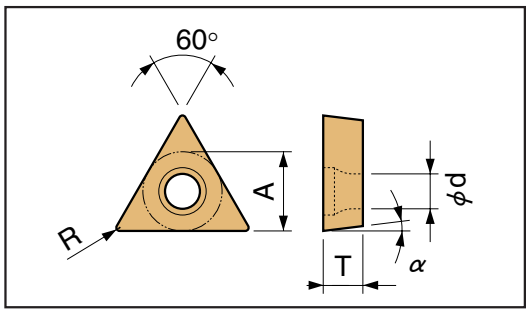
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Hexagon 80° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	WPGT 110202R/L-Y	6.35	2.38	2.8	0.2	11°			●					L	L											L	○	169
	WPGT 110204R/L-Y				0.4				●					L	L											L	○	
	WPGT 160304R/L-Y	9.525	3.18	4.4	0.4	11°			●					L	L											L	○	170
	WPGT 160308R/L-Y				0.8				●					L	L											L	○	
 Without Chipbreaker	WBGW060102R/L	3.97	1.59	2.3	0.2	5°			L																	L	167
	WBGW060104R/L				0.4				L																	L	168
	WBGW080202R/L	4.76	2.38	2.3	0.2	5°			L																	L	167 ~169
	WBGW080204R/L				0.4				L																	L	
 Without Chipbreaker	WPMW110202	6.35	2.38	2.8	0.2	11°													○								
	WPMW110204				0.4														○								
	WPMW160304	9.525	3.18	4.4	0.4	11°													○								169
	WPMW160308				0.8														○								
	WPGW110202	6.35	2.38	2.8	0.2	11°																				○	170
	WPGW110204				0.4																					○	
	WPGW160304	9.525	3.18	4.4	0.4	11°																				○	
	WPGW160308				0.8																					○	

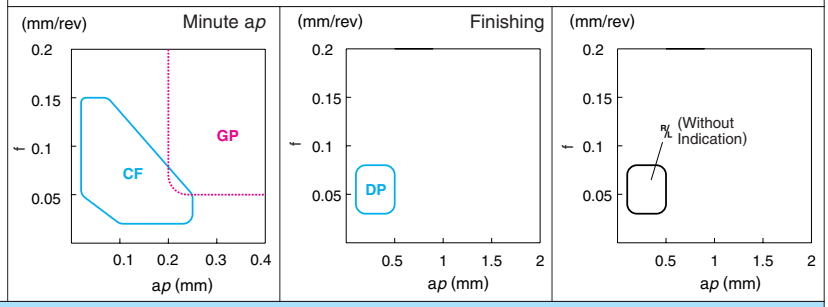
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · with Hole

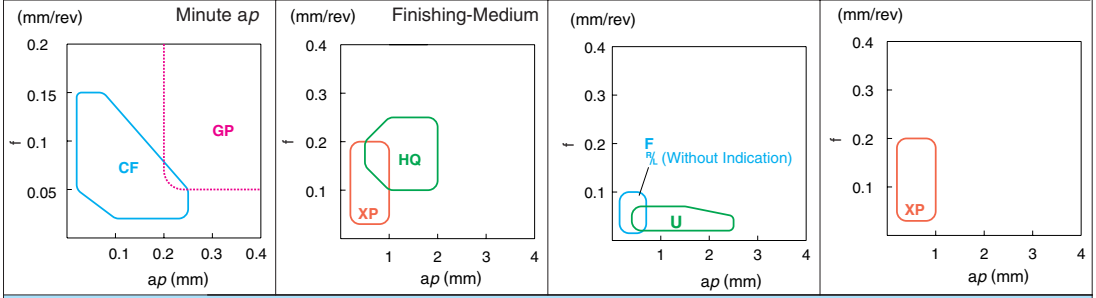


Application Range

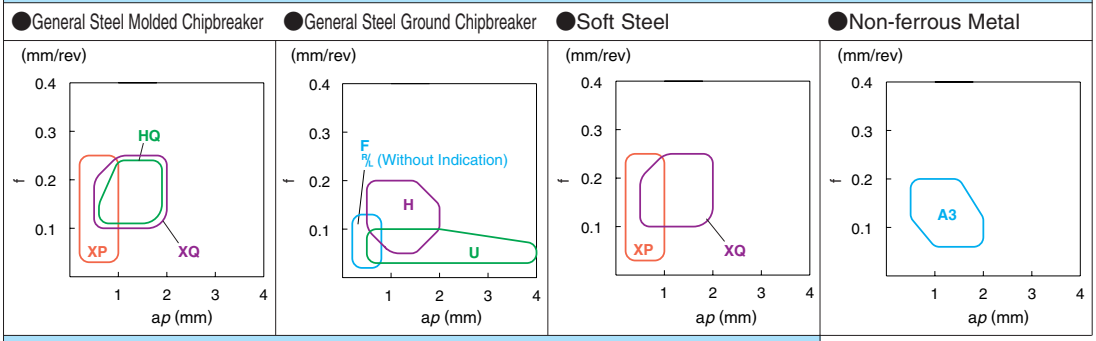
06 Type



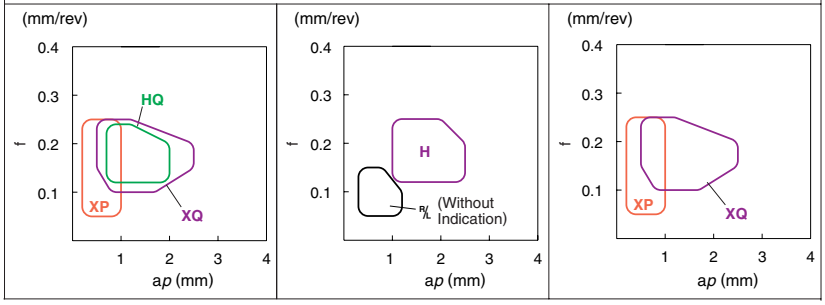
08/09 Type



11 Type



16 Type



Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	ϕd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Minute ap	NEW TBGT 060102CF	3.969	1.59	2.3	0.2	5°																			○	○		171 172
	TPGT 080202CF	4.76	2.38	2.3	0.2	11°																			○	○		132 171~6
	TPGT 090202CF	5.56	2.38	2.8	0.2	11°																			●	●		171~6

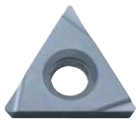
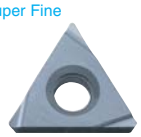
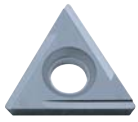
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	TPMT 090202GP 090204GP	5.56	2.38	2.8	0.2 0.4	11°	● ●		○ ○			● ●		○ ●	● ●		○ ○		○ ○	○ ○						○ ○		171 ~176
	TPMT 110304GP 110308GP	6.35	3.18	3.3	0.4 0.8	11°	● ●		○ ●			● ●		○ ○	● ●		○ ○		○ ○	● ○						○ ○		132 172~8
	TPMT 160304GP 160308GP	9.525	3.18	4.4	0.4 0.8	11°			○					● ●	● ●		○ ●		○	● ○						○		172 ~178
 Finishing	TBMT 060102DP 060104DP	3.969	1.59	2.3	0.2 0.4	5°			● ●								○ ○			● ●	○ ○					●		171 172
	TCMT 090202HQ 090204HQ	5.56	2.38	2.5	0.2 0.4	7°		● ●	● ●				● ●		● ●		● ●	● ●										–
	TCMT 110202HQ 110204HQ 110208HQ	6.35	2.38	2.8	0.2 0.4 0.8	7°		● ● ●	● ● ●				● ●		● ●		● ● ●	● ● ●	● ● ●	● ● ●						● ●		–
	TCMT 16T304HQ 16T308HQ 16T312HQ	9.525	3.97	4.4	0.4 0.8 1.2	7°		● ●	● ●				● ● ●		● ●		● ● ●	● ● ●	● ● ●				● ●					–
	TPMT 090202HQ 090204HQ	5.56	2.38	2.8	0.2 0.4	11°	● ●	○ ○	○ ○			● ●		○ ○	● ●		○ ●	● ●	○ ●	○ ●	○ ○		○ ○			● ●		171 ~176
	TPMT 110302HQ 110304HQ 110308HQ	6.35	3.18	3.3	0.2 0.4 0.8	11°	● ●	○ ● ●	○ ● ●			● ●		○ ○ ○	● ●		○ ○ ●	○ ● ●	○ ● ○	○ ● ●	○ ○ ○		○ ○			○ ● ○		132 172 ~178
Finishing-Medium	TPMT 160302HQ 160304HQ 160308HQ	9.525	3.18	4.4	0.2 0.4 0.8	11°		○ ● ●	○ ● ●					○ ○ ○	○ ○ ○		○ ● ●	○ ● ●	○ ○ ○	● ● ●	○ ○ ○		○ ○			○ ○ ○		172 ~178
 Soft Steel Finishing	TPMT 090204XP	5.56	2.38	2.8	0.4	11°						● ●		○ ○	○ ○		○ ○									○ ○		171~6
	TPMT 110304XP 110308XP	6.35	3.18	3.3	0.4 0.8	11°						● ●		● ○	● ●		● ○									○ ○		132 172~8
	TPMT 160304XP 160308XP	9.525	3.18	4.4	0.4 0.8	11°						● ●		○ ○	○ ○		○ ○											172 ~178
 Soft Steel Finishing-Medium	TPMT 110304XQ 110308XQ	6.35	3.18	3.3	0.4 0.8	11°						● ●		○ ○	● ●		● ●			● ○								132 172 ~178
	TPMT 160304XQ 160308XQ	9.525	3.18	4.4	0.4 0.8	11°						● ●		○ ○	● ●		● ○			○ ○								172 ~178
 Finishing	TBGT 0601003R/L 060101R/L 060102R/L 060104R/L	3.97	1.59	2.3	0.03 0.1 0.2 0.4	5°	L L	● L	L ● ● ●			L L		○ ○	L L							R L L		○ ○	○ ○	○ ○ ● ●	○ ● L	170 ~171
	TCGT 110201R/L 110202R/L 110204R/L	6.35	2.38	2.8	0.1 0.2 0.4	7°			● ● ●																			–

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	A	T	φd	R	α	TN6020	TN30	TN60	TN90	TC30	PV7020	PV30	PV60	PV90	CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PR610	PR660	PR905	PR915	PR930	KW10	Ref. Page for Toolholder
							Insert Grade: Cermet					PVD Cermet				CVD Coated						PVD Coated					Carbide	
 Finishing	TPGH 080201R/L	4.76	2.38	2.3	0.1	11°			R																	L	○	132
	TPGH 080202R/L				0.2		●	○	●		L	●	L	L	L							L		○	○	L	○	171
	TPGH 080204R/L				0.4		●	L	●		○	●	L	○	L							L				●	○	~176
	TPGH 090201R/L	5.56	2.38	3.0	0.1	11°			○																	○	○	171
	TPGH 090202R/L				0.2		●	●	●		L	●	L	L	L									○	○	L	○	~176
	TPGH 090204R/L				0.4		●	L	●		○	●	L	○	L											●	L	
	TPGH 110202R/L	6.35	2.38	3.5	0.2	11°			●					L	L											○	○	178
	TPGH 110204R/L				0.4				●		L			L	L											●	○	
	TPGH 110302R/L	6.35	3.18	3.3	0.2	11°	●	R	●		L	●	○	L	L							L				R	○	132
	TPGH 110304R/L				0.4		●	●	●		○	●	L	○	L											●	L	172
	TPGH 110308R/L				0.8			R	●					L	L											○	○	~178
	TPGH 160302R/L	9.525	3.18	4.5	0.2	11°			○					L	L											○	○	172
	TPGH 160304R/L				0.4		L	●	●		L	L	L	○	L							R				○	○	~178
	TPGH 160308R/L				0.8			○	●		L			L	L											○	○	
Super Fine  Finishing Sharp Edge / Precision	TPET 0802003R/L-FSF	4.76	2.38	2.3	0.03	11°																				○		32
	TPET 080201R/L-FSF				0.1				○																	○		171
	TPET 080202R/L-FSF				0.2				○																	L		~176
	TPET 1103003R/L-FSF	6.35	3.18	3.3	0.03	11°																				○		132
	TPET 110301R/L-FSF				0.1				○																	○		172
	TPET 110302R/L-FSF				0.2				○																	○		~178
 Medium	TPGH 090202R/L-H	5.56	2.38	3.0	0.2	11°			R																			171~6
	TPGH 110302R/L-H	6.35	3.18	3.3	0.2	11°	L	●	●			L		L	L							L				○	●	132
	TPGH 110304R/L-H				0.4		●	●	●			●		●	●											L	○	172
	TPGH 110308R/L-H				0.8		L		●			L		L	L											○	○	~178
	TPGH 160304R/L-H	9.525	3.18	4.5	0.4	11°	L	L	●			L		L	L											●	○	172
	TPGH 160308R/L-H				0.8				●					L	L											○	○	~178
	TPGT 160402R/L-H	9.525	4.76	4.4	0.2	11°			L																			–
	TPGT 160404R/L-H				0.4				L																			
	TPGT 160408R/L-H				0.8				L																			
 Low Feed / Sharp Edge	TCGT 0802003F R/L-U	4.76	2.38	2.3	0.03	7°																				○		132
	TCGT 080201F R/L-U				0.1				●																	○	○	
	TCGT 080202F R/L-U				0.2			R	●				R													○	○	
	TCGT 1103003F R/L-U	6.35	3.18	2.8	0.03	7°																				R	R	
	TCGT 110301F R/L-U				0.1			R	●				R													○	●	
	TCGT 110302F R/L-U				0.2			R	●				R													○	●	
Super Fine  Low Feed Sharp Edge / Precision	TCET 0802003F R/L-USF	4.76	2.38	2.3	0.03	7°																				○		
	TCET 080201F R/L-USF				0.1				○																	○		
	TCET 080202F R/L-USF				0.2				○																	○		
	TCET 1103003F R/L-USF	6.35	3.18	2.8	0.03	7°																				○		
	TCET 110301F R/L-USF				0.1				○																	○		
	TCET 110302F R/L-USF				0.2				○																	○		
Super Fine  Low Feed Sharp Edge / Precision	TPET 0802003F R/L-USF	4.76	2.38	2.3	0.03	11°																				○		132
	TPET 080201F R/L-USF				0.1				○																	○		171
	TPET 080202F R/L-USF				0.2				○																	○		~176
	TPET 1103003F R/L-USF	6.35	3.18	2.8	0.03	11°																				L		132
	TPET 110301F R/L-USF				0.1				○																	○		172
	TPET 110302F R/L-USF				0.2				○																	●		~178
 Low Feed / With Honing	TCGT 080201E R/L-U	4.76	2.38	2.3	0.1	7°			●																	○		
	TCGT 080202E R/L-U				0.2			R	●																	○		
	TCGT 110301E R/L-U	6.35	3.18	2.8	0.1	7°			●																	○		132
	TCGT 110302E R/L-U				0.2				●																	○		
	TCGT 110304E R/L-U				0.4			R	●																	●		

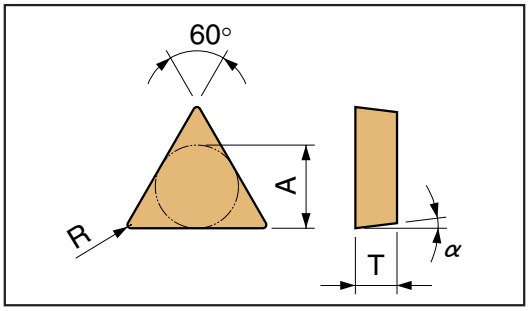
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · with Hole

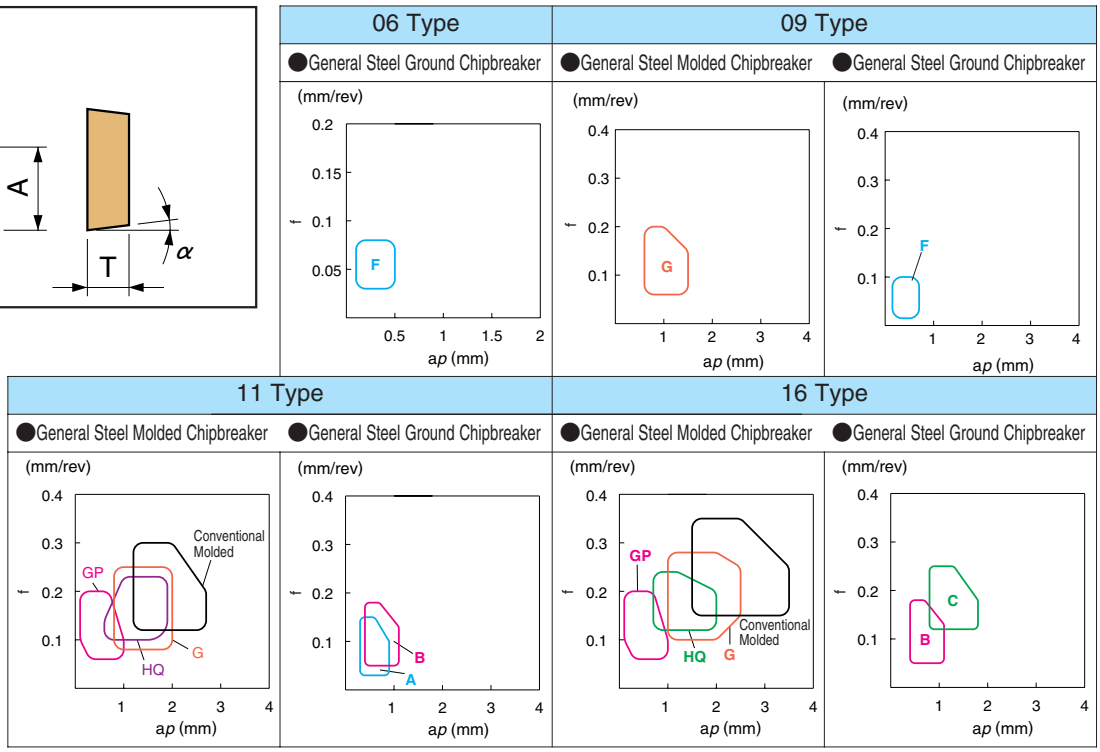
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Non-ferrous Metal Finishing-Medium	**TCGT 110302R/L-A3**	6.35	3.18	2.8	0.2	7°																					○	132
	110304R/L-A3				0.4																						○	
 Without Chipbreaker	**TBGW 060102**	3.97	1.59	2.3	0.2	5°			○					○													○	171
	060104				0.4				○																		○	172
	TCGW 080201	4.76	2.38	2.3	0.1	7°																					○	132
	080202				0.2																						○	
	TCGW 110301	6.35	3.18	2.8	0.1	7°																					○	132
	110302				0.2																						○	
	110304				0.4																						○	
 Without Chipbreaker	**TPGB 080202**	4.76	2.38	2.3	0.2	11°		○	●			○		○													○	132
	080204				0.4		●	○	●																		○	171
	080208				0.8				○																			～176
	TPGB 090202	5.56	2.38	3.0	0.2	11°		○	●			○		○													○	171
	090204				0.4		●	○	○		○																○	～176
	TPGB 1102005	6.35	2.38	3.5	0.05	11°			○																		○	178
	110201				0.1				●																		○	
	110202				0.2			○	●		○																○	
	110204				0.4				○																		○	
	TPGB 1103005	6.35	3.18	3.3	0.05	11°			○																		○	132
	110301				0.1				●					○													○	
	110302				0.2		●	○	●		○	○		○													○	172
	110304				0.4		●	○	●		○	○		○													○	～178
	110308				0.8		●	○	●		○	○															○	
Without Chipbreaker	**TPGB 160304**	9.525	3.18	4.5	0.4	11°		○	●		○																○	172
	160308				0.8				●		○																○	～178

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · without Hole



Application Range



Shape Handed Insert shows Left-hand	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	TPMR 110304GP	6.35	3.18	–	0.4	11°			○						●				○									
	TPMR 160304GP	9.525	3.18	–	0.4	11°			○						●		○		○	○								
 Finishing	TPMR 110304DP 110308DP	6.35	3.18	–	0.4 0.8	11°		● ●	● ●																			
	TPMR 160304DP 160308DP	9.525	3.18	–	0.4 0.8	11°		● ●	● ●																			133
	TPGR 110304DP 110308DP	6.35	3.18	–	0.4 0.8	11°					○																	179
	TPGR 160304DP 160308DP	9.525	3.18	–	0.4 0.8	11°					○ ○																	
 Finishing-Medium	TPMR 110304HQ 110308HQ	6.35	3.18	–	0.4 0.8	11°		● ●	● ●						○ ○		○ ●		○ ●	● ●	○		○ ○					
	TPMR 160304HQ 160308HQ	9.525	3.18	–	0.4 0.8	11°		○ ●	● ●						○ ●		● ●		○ ○	● ●	○ ○		○ ○					
 Medium	TPMR 090202G 090204G	5.56	2.38	–	0.2 0.4	11°		● ●	○ ○								○ ○		○ ○	○ ○	○ ○		○ ○					179
	TPMR 110304G 110308G	6.35	3.18	–	0.4 0.8	11°			● ●						○ ○													133
	TPMR 160304G 160308G	9.525	3.18	–	0.4 0.8	11°			○ ○						○ ○													179
 Medium	TPMR 110304 110308	6.35	3.18	–	0.4 0.8	11°		○ ●	● ○		○						● ●		○ ●	○ ●	○ ○		○ ○					133
	TPMR 160304 160308	9.525	3.18	–	0.4 0.8	11°		● ○	● ●		○ ○		○ ○				● ●		● ●	● ●	○ ○		○ ○					179

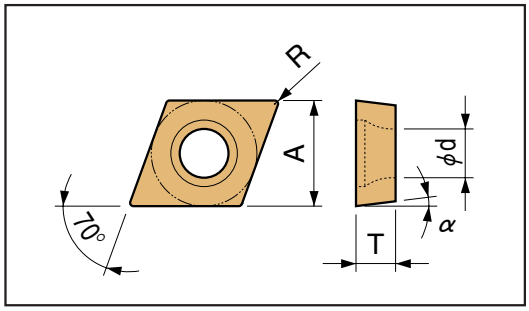
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Triangle 60° · Positive · without Hole

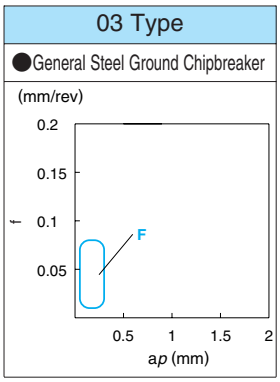
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	TCGR 060102R/L-F 060104R/L-F	3.97	1.59	–	0.2 0.4	7°			L ○																			–
	TPGR 090202R/L-F 090204R/L-F 090208R/L-F	5.56	2.38	–	0.2 0.4 0.8	11°			○ ○ ○																			179
 -A: Finishing -B: Finishing-Medium -C: Medium	TPGR 110302R/L-A 110304R/L-A	6.35	3.18	–	0.2 0.4	11°	L L	L ○	● ●		○ ○	L L		L ○	L L												○	133 179
	TPGR 110304R/L-B 110308R/L-B	6.35	3.18	–	0.4 0.8	11°	L	○ R	● ●		○ L	L		○ L	L L													
	TPGR 160302R/L-B 160304R/L-B 160308R/L-B	9.525	3.18	–	0.2 0.4 0.8	11°	L L L	L ○ L	● ● ●		○ ○ L	L L L		L ○ L	L L L												○ ○	
	TPGR 160304R/L-C 160308R/L-C	9.525	3.18	–	0.4 0.8	11°	L L	L L	● ●		○ ○	L L		● L	L L													
 Without Chipbreaker	TCGN 060102 060104	3.97	1.59	–	0.2 0.4	7°			○ ○																		○ ○	–
	TPUN 160304 160308	9.525	3.18	–	0.4 0.8	11°																	● ●					133 179
	TPMN 110304 110308	6.35	3.18	–	0.4 0.8	11°													● ●								● ●	
	TPMN 160304 160308 160312	9.525	3.18	–	0.4 0.8 1.2	11°							○ ○						● ● ●								● ●	
	TPGN 090202 090204 090208	5.56	2.38	–	0.2 0.4 0.8	11°		○	○ ○ ○		○																○ ○	179
	TPGN 110302 110304 110308	6.35	3.18	–	0.2 0.4 0.8	11°		● ○	● ●		○ ○ ○																○ ○ ○	133
	TPGN 160304 160308 160312	9.525	3.18	–	0.4 0.8 1.2	11°		○ ○	● ●		○ ○																● ○ ○	179

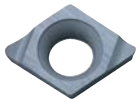
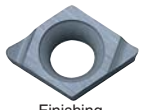
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 70° · Positive · with Hole

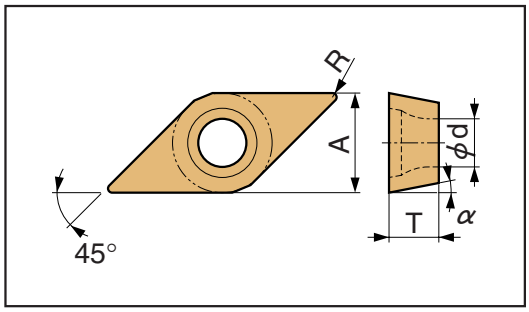


Application Range

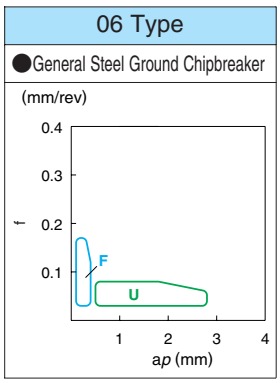


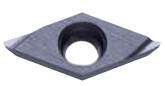
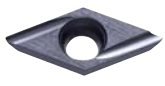
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	JCGT 030101ℝ/𝕃-F 030102ℝ/𝕃-F 030104ℝ/𝕃-F	3.5	1.4	1.9	0.1 0.2 0.4	7°			○ ○ ○												R				● ● ●	○ ○ ○	180
Super Fine  Finishing Sharp Edge / Precision	JCET 030101ℝ/𝕃-FSF 030102ℝ/𝕃-FSF 030104ℝ/𝕃-FSF	3.5	1.4	1.9	0.1 0.2 0.4	7°			○ ○ ○																○ ○ ○		

■ Rhombic 45° · Positive · with Hole



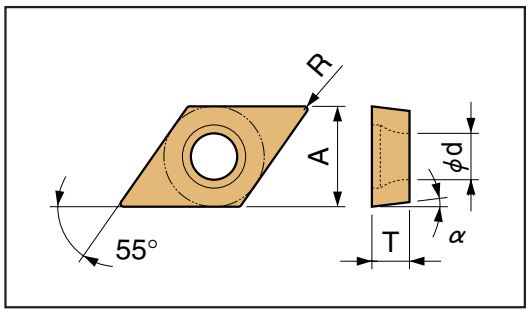
Application Range



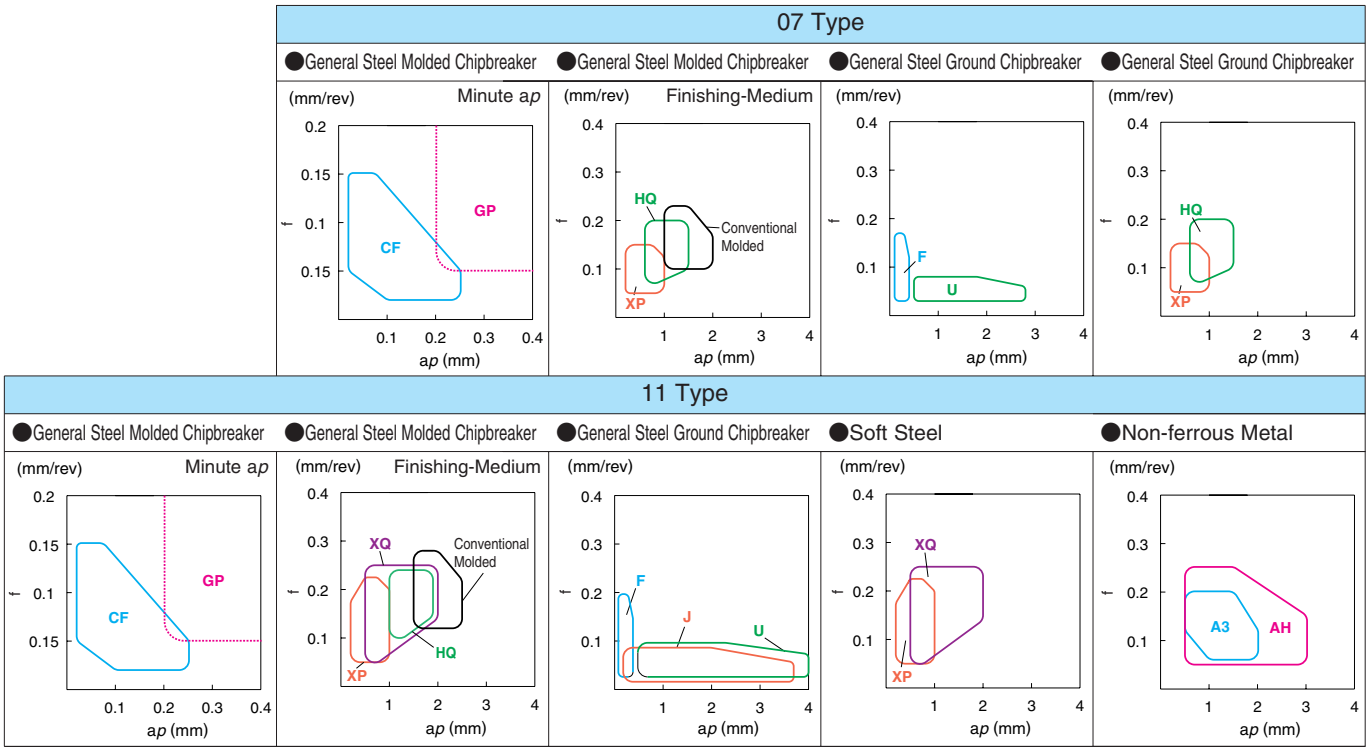
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	YPGT 060201ℝ/𝕃-F 060202ℝ/𝕃-F	4.76	2.38	2.3	0.1 0.2	11°																		- R	- ○			139
 Low Feed / Sharp Edge	YPGT 060201F𝕃-U 060202F𝕃-U	4.76	2.38	2.3	0.1 0.2	11°																		- ○	- R			181

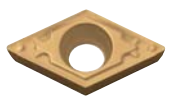
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 55° · Positive · with Hole



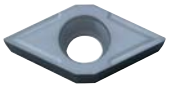
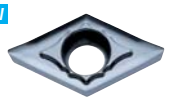
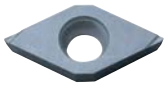
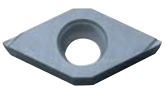
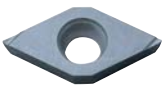
Application Range



Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
NEW  Minute ap	DCGT 070202CF	6.35	2.38	2.8	0.2	7°																			●	○		134 ~138 182
	DCGT 11T302CF	9.525	3.97	4.4	0.2	7°																			●	○		
 Finishing	DCMT 070202GP 070204GP	6.35	2.38	2.8	0.2 0.4	7°	● ●		○ ○			● ●		○ ○	● ●		○ ○		○ ○	○ ○						○ ●		
	DCMT 11T304GP 11T308GP	9.525	3.97	4.4	0.4 0.8	7°	● ●		● ●	●		● ●		○ ○	● ●		○ ●	● ●	○ ○	● ○						○ ○		
 Finishing-Medium	DCMT 070202HQ 070204HQ 070208HQ	6.35	2.38	2.8	0.2 0.4 0.8	7°	● ● ●	● ● ●	● ● ●			● ● ●		○ ○ ○	● ● ●		○ ● ●		○ ● ●	● ● ●	○ ○ ○		○ ● ●			● ● ●		
	DCMT 11T302HQ 11T304HQ 11T308HQ	9.525	3.97	4.4	0.2 0.4 0.8	7°	● ● ●	● ● ●	● ● ●			● ● ●	● ●	○ ○ ○	● ● ●		● ● ●	● ● ●	● ● ●	● ● ●			○ ● ●			● ● ●		

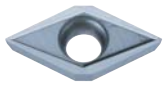
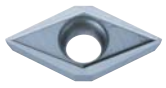
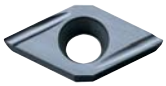
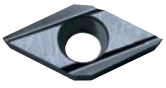
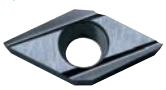
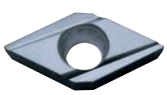
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Rhombic 55° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium	DCGT 070201	6.35	2.38	2.8	0.1	7°	●	●	●			●	○	○	●											●		134 ~138 182
	DCGT 070202				0.2		●	●	●			●	○	○	●											●		
	DCGT 070204				0.4		●	●	●			●	○	○	○											●		
	DCGT 11T301	9.525	3.97	4.4	0.1	7°		●	●				○	○	●											●		
	DCGT 11T302				0.2		●	●	●			●	○	○	●											○		
	DCGT 11T304				0.4		●	●	●			●	○	○	●											●		
	DCMT 11T308	9.525	3.97	4.4	0.8	7°	●	●	●			●	●	○	●			●	○							○		
 Medium	DCMT 070204GK	6.35	2.38	2.8	0.4	7°	●		●			●			●			●							●	●		
	DCMT 11T304GK	9.525	3.97	4.4	0.4	7°	●		●			●			●			●							●	●		
 Medium	DCMT 11T304HF	9.525	3.97	4.4	0.4	7°			●						●		●											
 Soft Steel Finishing	DCMT 070204XP	6.35	2.38	2.8	0.4	7°						●		○	●		●									●		
	DCMT 11T302XP	9.525	3.97	4.4	0.2	7°						●		○	●		●									●		
	DCMT 11T304XP				0.4							●		○	●		○									●		
	DCMT 11T308XP				0.8							●		○	●		○											
 Soft Steel Finishing-Medium	DCMT 11T304XQ	9.525	3.97	4.4	0.4	7°	●					●		●	●		●	●		●								
	DCMT 11T308XQ				0.8		●					●		○	●		●	●		●								
NEW  Non-ferrous Metal Finishing-Medium	DCGT 11T304AH	9.525	3.97	4.4	0.4	7°																					●	
	DCGT 11T308AH				0.8																						●	
 Finishing	DCGT 0702003R/L-F	6.35	2.38	2.8	0.03	7°			●																	○	○	
	DCGT 070201R/L-F				0.1				●																	○	○	
	DCGT 070202R/L-F				0.2				●																	○	○	
	DCGT 070204R/L-F				0.4				●																	○	○	
	DCGT 11T3003R/L-F	9.525	3.97	4.4	0.03	7°																				●	R	
	DCGT 11T301R/L-F				0.1				●																	○	○	
	DCGT 11T302R/L-F				0.2				●																	○	○	
	DCGT 11T304R/L-F				0.4				●																	○	○	
Super Fine  Finishing Sharp Edge / Precision	DCET 0702003R/L-FSF	6.35	2.38	2.8	0.03	7°			○																	●		
	DCET 070201R/L-FSF				0.1				○																	○		
	DCET 070202R/L-FSF				0.2				○																	○		
	DCET 070204R/L-FSF				0.4				○																	●		
	DCET 11T3003R/L-FSF	9.525	3.97	4.4	0.03	7°																				R		
	DCET 11T301R/L-FSF				0.1				●																	○		
	DCET 11T302R/L-FSF				0.2				○																	○		
	DCET 11T304R/L-FSF				0.4				○																	●		
Super Fine  Finishing Sharp Edge / Precision	DPET 0702003R/L-FSF	6.35	2.38	2.8	0.03	11°																				○		138
	DPET 070201R/L-FSF				0.1				○																	○		
	DPET 070202R/L-FSF				0.2				○																	R		
	DPET 11T3003R/L-FSF	9.525	3.97	4.4	0.03	11°																				○		
	DPET 11T301R/L-FSF				0.1				○																	R		
	DPET 11T302R/L-FSF				0.2				○																	○		

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

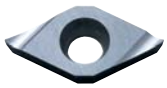
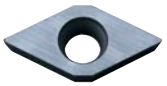
■ Rhombic 55° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	A	T	φd	R	α	Cermet TN6020	Cermet TN30	Cermet TN60	Cermet TN90	Cermet TC30	PVD Cermet PV7020	PVD Cermet PV30	PVD Cermet PV60	PVD Cermet PV90	CVD Coated CA4010	CVD Coated CA5025	CVD Coated CA6015	CVD Coated CR7015	CVD Coated CR7025	CVD Coated CA225	PVD Coated PR610	PVD Coated PR660	PVD Coated PR905	PVD Coated PR915	PVD Coated PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing-Medium	DCGT 070202R/L-FS 070204R/L-FS	6.35	2.38	2.8	0.2 0.4	7°			●																			134 ~138 182
	DCGT 11T302R/L-FS 11T304R/L-FS 11T308R/L-FS	9.525	3.97	4.4	0.2 0.4 0.8	7°			● ● ●																			
 Medium / Sharp Edge	DCGT 070202FN-Z 070204FN-Z	6.35	2.38	2.8	0.2 0.4	7°			● ●																	● ●		
	DCGT 11T302FN-Z 11T304FN-Z 11T308FN-Z	9.525	3.97	4.4	0.2 0.4 0.8	7°			● ● ●																	● ● ●		
 Medium / With Honing	DCGT 11T302EN-Z 11T304EN-Z	9.525	3.97	4.4	0.2 0.4	7°									● ●													
 Low Feed / Sharp Edge	DCGT 0702003FR/L-U 070201FR/L-U 070202FR/L-U	6.35	2.38	2.8	0.03 0.1 0.2	7°	● ●	○	○ ● ●			● ●	R		● ●							R		○	○	○ R ○	○ ● ○	
	DCGT 11T3003FR/L-U 11T301FR/L-U 11T302FR/L-U	9.525	3.97	4.4	0.03 0.1 0.2	7°	● ●	R	● ● ●			● ●	R R									R R		○	○	○ ○ ○	R ● ●	
Super Fine  Low Feed Sharp Edge / Precision	DCET 0702003FR/L-USF 070201FR/L-USF 070202FR/L-USF	6.35	2.38	2.8	0.03 0.1 0.2	7°			○ ○																	○ ○ ●		
	DCET 11T3003FR/L-USF 11T301FR/L-USF 11T302FR/L-USF	9.525	3.97	4.4	0.03 0.1 0.2	7°			R ○ ○																	R ○ R		
Super Fine  Low Feed Sharp Edge / Precision	DPET 0702003FR/L-USF 070201FR/L-USF 070202FR/L-USF	6.35	2.38	2.8	0.03 0.1 0.2	11°			○ ○																	○ ○ ○		138
	DPET 11T3003FR/L-USF 11T301FR/L-USF 11T302FR/L-USF	9.525	3.97	4.4	0.03 0.1 0.2	11°			○ ○																	○ ○ ○		
 Low Feed / With Honing	DCGT 070201ER/L-U 070202ER/L-U 070204ER/L-U	6.35	2.38	2.8	0.1 0.2 0.4	7°		R R	○ ○ ●				R		● ●											○ ○ ○		
	DCGT 11T301ER/L-U 11T302ER/L-U 11T304ER/L-U	9.525	3.97	4.4	0.1 0.2 0.4	7°	● ●	R ○	● ● ●			● ●	○		● ●											○ ● ●		
 Low Feed / Sharp Edge	DCGT 11T3003FR/L-J 11T301FR/L-J 11T302FR/L-J	9.525	3.97	4.4	0.03 0.1 0.2	7°			○ ○														R R			○ ○ ○	○ ○	134 ~138 182
Super Fine  Low Feed Sharp Edge / Precision	DCET 11T3003FR/L-JSF 11T301FR/L-JSF 11T302FR/L-JSF	9.525	3.97	4.4	0.03 0.1 0.2	7°			○ ○																	○ ○ R		
 Low Feed / With Honing	DCGT 11T3003ER/L-J 11T301ER/L-J 11T302ER/L-J 11T304ER/L-J	9.525	3.97	4.4	0.03 0.1 0.2 0.4	7°			○ ○ ○														R R			○ ○ ○	○ ○ ○	

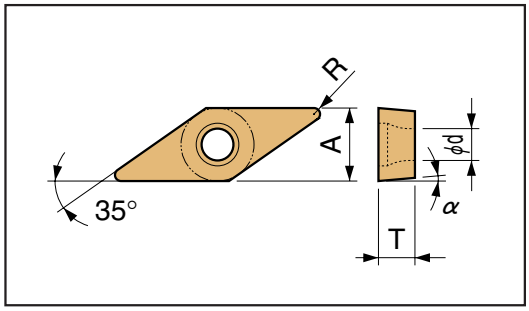
● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

Turning Indexable Inserts [Cermet · Coated · Carbide]

■ Rhombic 55° · Positive · with Hole

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Non-ferrous Metal Finishing-Medium	**DCGT 070202R/L-A3**	6.35	2.38	2.8	0.2	7°																					R	134 ~138 182
	DCGT 11T302R/L-A3	9.525	3.97	4.4	0.2	7°																					●	
	11T304R/L-A3				0.4																						●	
 Without Chipbreaker	**DCGW 070201**	6.35	2.38	2.8	0.1	7°																					●	
	070202				0.2																						○	
	DCGW 11T301	9.525	3.97	4.4	0.1	7°																					●	
	11T302				0.2																						○	
	11T304				0.4																						●	

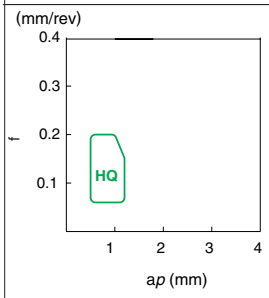
■ Rhombic 35° · Positive · with Hole



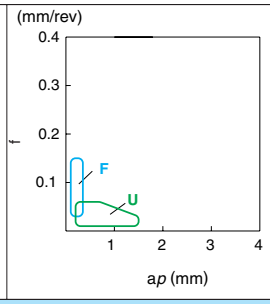
Application Range

08 Type

●General Steel Molded Chipbreaker

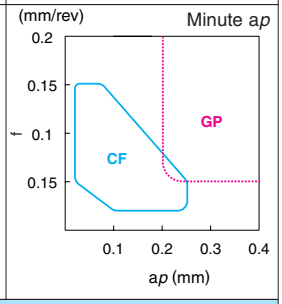


●General Steel Ground Chipbreaker



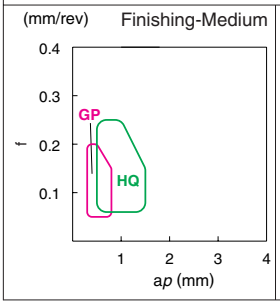
11 Type

●General Steel Molded Chipbreaker

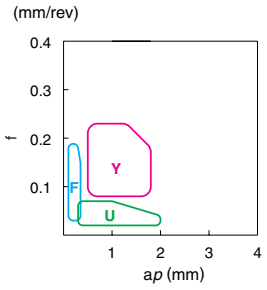


11 Type

●General Steel Molded Chipbreaker

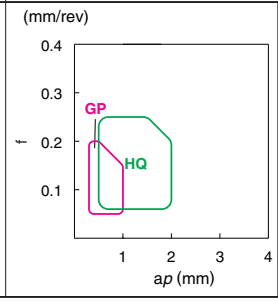


●General Steel Ground Chipbreaker

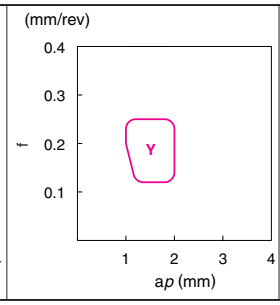


16 Type

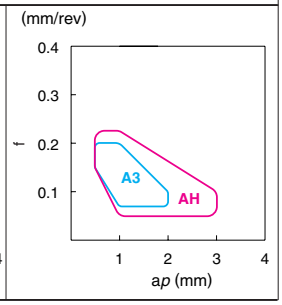
●General Steel Molded Chipbreaker



●General Steel Ground Chipbreaker



●Non-ferrous Metal

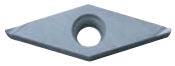
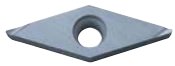
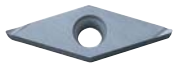
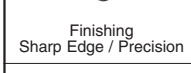
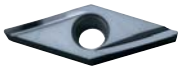
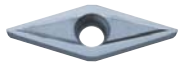
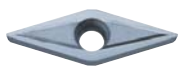
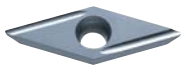
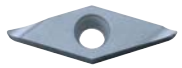


Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	ϕd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
NEW  Minute ap	VPGT 110302CF	6.35	3.18	2.8	0.2	11°																			●	○		142
 Finishing	VBMT 110304GP	6.35	3.18	2.8	0.4	5°	●		●			●		●	●		○		○	●						●		140 ~142 184
	VBMT 160404GP 160408GP	9.525	4.76	4.4	0.4 0.8	5°	● ●	○	● ○			● ●		○ ○	● ●		○ ○		● ○	● ●						○ ○		
 Finishing-Medium	VBMT 110304HQ 110308HQ	6.35	3.18	2.8	0.4 0.8	5°	● ●	● ●	● ●			● ●	○ ○	○ ○	● ○		● ●	● ●	● ●	● ●	○ ○		○ ○			● ●		140 ~142 184
	VBMT 160404HQ 160408HQ 160412HQ	9.525	4.76	4.4	0.4 0.8 1.2	5°	● ●	● ●	● ●	●		● ●	● ●	○ ○	● ● ●		● ● ●	● ●	● ● ○	● ● ○	○ ○ ○		○ ○ ○			● ● ●		
	VCMT 080202HQ 080204HQ	4.76	2.38	2.3	0.2 0.4	7°	●		○ ○			●		○ ○	● ●		● ●	● ●		○ ○						● ●		184
	VCMT 110304HQ 110308HQ	6.35	3.18	2.8	0.4 0.8	7°			●										● ●	● ●						●		140 ~142 184
	VCMT 160404HQ 160408HQ	9.525	4.76	4.4	0.4 0.8	7°			● ●						● ●				● ●	● ●								
NEW  Non-ferrous Metal Finishing-Medium	VCGT 160404AH	9.525	4.76	4.4	0.4	7°																				●	140 ~142 184
 Non-ferrous Metal Medium-Roughing	VCGT 160412	9.525	4.76	4.4	1.2	7°																				●	140 ~142 184
	VCGT 220530	12.70	5.56	5.5	3.0	7°																				●	–

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

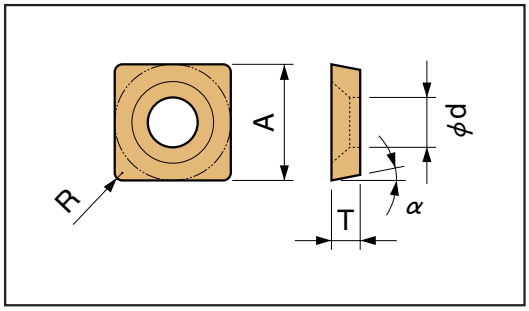
Turning Indexable Inserts [Cermet · Coated · Carbide]

■ Rhombic 35° · Positive · with Hole

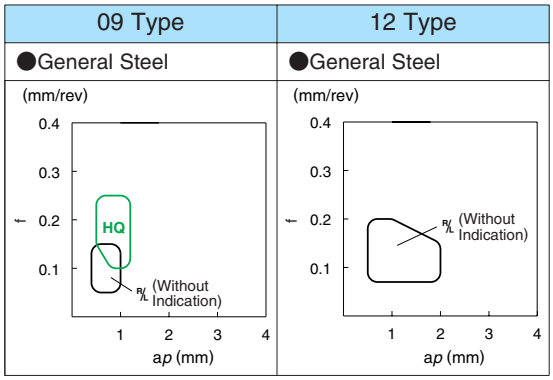
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Finishing	VBGT 1103003R/L-F 110301R/L-F 110302R/L-F	6.35	3.18	2.8	0.03 0.1 0.2	5°	 ●	 	 ○ ●	 	 	 ○	 	 ○ ○	 	 	 	 	 	 	 	 L	 	 	 	○ ○ ○	R ○ ○	140 ~142 184
Super Fine  Finishing Sharp Edge / Precision	VBET 1103003R/L-FSF 110301R/L-FSF 110302R/L-FSF	6.35	3.18	2.8	0.03 0.1 0.2	5°			○ ○ ○																	○ ○ ○		184
Super Fine  Finishing Sharp Edge / Precision	VPET 0802003R/L-FSF 080201R/L-FSF 080202R/L-FSF	4.76	2.38	2.3	0.03 0.1 0.2	11°			○ ○																	○ ○		184
 Finishing Sharp Edge / Precision	VPET 1103003R/L-FSF 110301R/L-FSF 110302R/L-FSF	6.35	3.18	2.8	0.03 0.1 0.2	11°			 ○ ○																	L ○ ○		142
 Finishing-Medium	VBGT 1103003R/L-Y 110301R/L-Y 110302R/L-Y 110304R/L-Y 110308R/L-Y	6.35	3.18	2.8	0.03 0.1 0.2 0.4 0.8	5°	 ● ●	 	 ○ ● ● L	 	 	 ○ ○	 	 ○ ○	 	 	 	 	 	 	 	 L R R	 	 	 	● R ● ● R	R ● ● ○ ○	140 ~142 184
	VBGT 160402R/L-Y 160404R/L-Y 160408R/L-Y	9.525	4.76	4.4	0.2 0.4 0.8	5°	●		○ ● ○			○		○ ○								○				R ● ●	○ ○ ○	
	VCGT 110302R/L-Y 110304R/L-Y	6.35	3.18	2.8	0.2 0.4	7°			● ●																			
	VCGT 160404R/L-Y	9.525	4.76	4.4	0.4	5°			●																			
 Medium / Sharp Edge	VBGT 110301FN-Z 110302FN-Z 110304FN-Z 110308FN-Z	6.35	3.18	2.8	0.1 0.2 0.4 0.8	5°			● ● ● 																	● ● ● ●		140 ~142 184
	VCGT 110301FN-Z 110302FN-Z 110304FN-Z	6.35	3.18	2.8	0.1 0.2 0.4	7°			● ● ●																			
 Medium / With Honing	VBGT 110302EN-Z 110304EN-Z	6.35	3.18	2.8	0.2 0.4	5°									● ●													
 Low Feed / Sharp Edge	VPGT 110301FR/L-U 110302FR/L-U	6.35	3.18	2.8	0.1 0.2	11°																		- ○	- ○			142
Super Fine  Low Feed Sharp Edge / Precision	VPET 0802003FR/L-USF 080201FR/L-USF 080202FR/L-USF	4.76	2.38	2.3	0.03 0.1 0.2	11°			○ R																	○ ○		184
	VPET 1103003FR/L-USF 110301FR/L-USF 110302FR/L-USF	6.35	3.18	2.8	0.03 0.1 0.2	11°			○ ○																	L ○ ○		142
 Non-ferrous Metal Finishing-Medium	VCGT 160404R/L-A3 160408R/L-A3	9.525	4.76	4.4	0.4 0.8	7°																					R ○	140 ~142 184

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Square 90° · Positive · with Hole

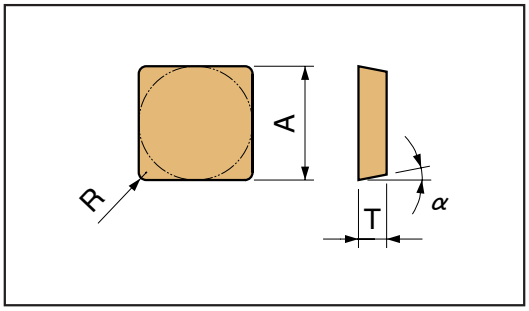


Application Range

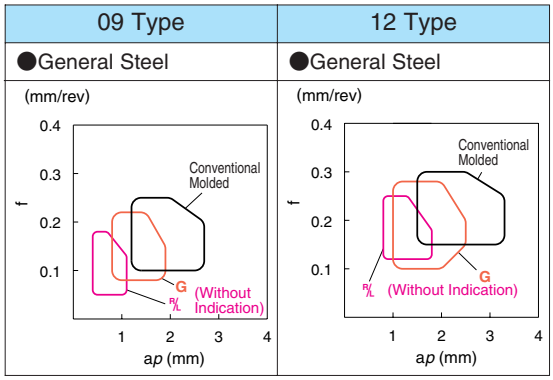


Shape Handed Insert shows Left-hand	Description	Dimension (mm)				Angle (°)	Insert Grade																				Ref. Page for Toolholder
							Cermet					PVD Cermet				CVD Coated						PVD Coated					Carbide	
		A	T	φd	R	α	TN6020	TN30	TN60	TN90	TC30	PV7020	PV30	PV60	PV90	CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PR610	PR660	PR905	PR915	PR930	KW10	
 Finishing-Medium	**SCMT 09T304HQ** **09T308HQ**	9.525	3.97	4.4	0.4 0.8	7°			● ●						●		● ●			● ○								–
 Finishing	**SPGH 090304R/L** **090308R/L**	9.525	3.18	4.5	0.4 0.8	11°			L L																			187
	SPGH 120304R/L **120308R/L**	12.70	3.18	5.5	0.4 0.8	11°			L L																			

■ Square 90° · Positive · without Hole



Application Range

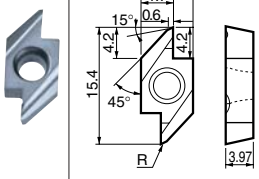
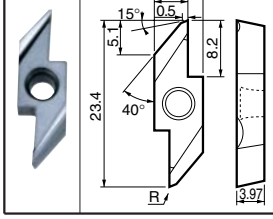


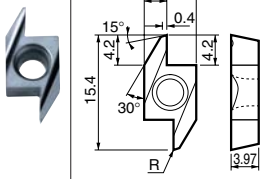
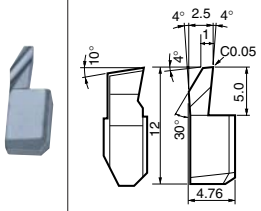
Shape Handed Insert shows Left-hand	Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade: Cermet TN6020	TN30	TN60	TN90	TC30	PVD Cermet PV7020	PV30	PV60	PV90	CVD Coated CA4010	CA5025	CA6015	CR7015	CR7025	CA225	PVD Coated PR610	PR660	PR905	PR915	PR930	Carbide KW10	Ref. Page for Toolholder
 Medium	SPMR 090304G 090308G	9.525	3.18	–	0.4 0.8	11°			●						● ○													
	SPMR 120304G 120308G	12.70	3.18	–	0.4 0.8	11°			● ●						○ ○													
 Medium	SPMR 090304 090308	9.525	3.18	–	0.4 0.8	11°										● ●		● ○	○ ○	○ ○		○ ○						
	SPMR 120304 120308	12.70	3.18	–	0.4 0.8	11°					○ ○					● ●		● ○	○ ○	○ ○		○ ○						
 Finishing	SPGR 090304R/L 090308R/L	9.525	3.18	–	0.4 0.8	11°			● ●		○																	143 ~144 187
	SPGR 120304R/L 120308R/L	12.70	3.18	–	0.4 0.8	11°			● ●		L R																	
 Without Chipbreaker	SPUN 090308	9.525	3.18	–	0.8	11°													●			●						
	SPMN 090304 090308	9.525	3.18	–	0.4 0.8	11°							○															
	SPMN 120304 120308 120312	12.70	3.18	–	0.4 0.8 1.2	11°			○ ○				○						○ ○	● ●							● ●	
	SPGN 090304 090308	9.525	3.18	–	0.4 0.8	11°			●		○ ○																● ●	
	SPGN 120304 120308	12.70	3.18	–	0.4 0.8	11°			●		○ ○																● ●	

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

Inserts for Back Turning [Cermet · Coated · Carbide]

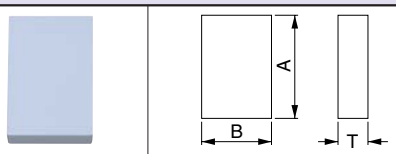
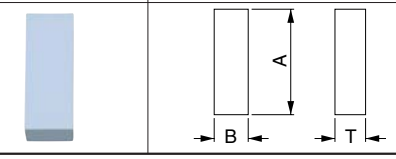
■ Inserts for Back Turning (Small Tool)

Shape (Right-hand Shown)	Description	Corner-R (mm)	Insert Grade: Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Ref. Page for Toolholder
	**ABW 15ºR/L 4005** **15ºR/L 4015**	0.05 0.15	R R	R R	● ●	R R	126
	**ABW 23ºR/L 5005** **23ºR/L 5015**	0.05 0.15	R R	R R	R R	R R	127

Shape (Right-hand Shown)	Description	Corner-R (mm)	Insert Grade: Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Ref. Page for Toolholder
	**ABS 15ºR/L 4005** **15ºR/L 4015**	0.05 0.15	R R	R R	R R	R R	128
	**AB 12ºR/L 250**	C0.05	R			R	129

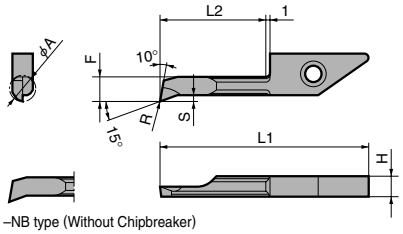
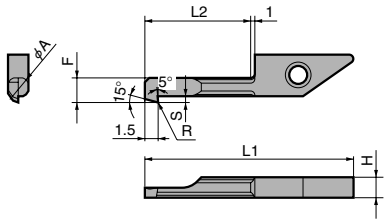
Inserts for Brazed Tools [Cermet]

■ Inserts for Brazed Tools

Shape	Description	Dimension (mm) A	B	T	Insert Grade: Cermet TC60
	**02 -1**	13	9	3	●
	-2	16	11	4	●
	-3	19	13	5	○
	-4	22	15	6	
	**08 -1**	8	3	3	
	-3	13	4	4	○
	-4	15	5	5	●
	-5	17	6	6	
	-6	20	8	8	

■ Micro Boring

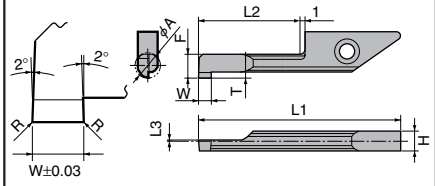
See Page. 154 for Details

Shape (Right-hand Shown)	Description	Min. Bore Dia.	Dimension (mm)						Insert Grade: Cermet	Insert Grade: PVD Coated			Insert Grade: Carbide
		ϕA	H	L1	L2	F	S	R	TC60	PR630	PR915	PR930	KW10
 –NB type (Without Chipbreaker)	VNB R/L 0206-003	2	3.9	25.8	6	1.8	0.25					R	R
	0311-003	3	3.9	30.8	11	2.6	0.4					R	R
	0411-003	4	3.9	30.8	11	3.5	0.5		R	R		●	R
	0420-003			39.8	20				R	R		R	R
	0511-003	5	3.9	30.8	11	4.5	0.7	0.03	R	R		R	R
	0520-003			39.8	20				R	R		R	R
	0620-003	6	3.9	39.8	20	5.3	1.0		R	R		R	R
	0630-003			49.8	30				R	R		R	R
	0720-003	7	3.9	39.8	20	6.2	1.0		R	R		R	R
	0730-003			49.8	30				R	R		R	R
	VNB R/L 0206-02	2	3.9	26.5	6	1.8	0.25					R	R
	0311-02	3	3.9	30.8	11	2.6	0.4				R	R	R
	0411-02	4	3.9	30.8	11	3.5	0.5				R	●	R
	0420-02			39.8	20							R	R
	0511-02	5	3.9	30.8	11	4.5	0.7	0.2				R	R
	0520-02			39.8	20							R	R
	0620-02	6	3.9	39.8	20	5.3	1.0					R	R
	0630-02			49.8	30							R	R
	0720-02	7	3.9	39.8	20	6.2	1.0					R	R
	0730-02			49.8	30							R	R
	VNB R/L 0206-003NB	2	3.9	26.5	6	1.8	0.25					R	R
	0311-003NB	3	3.9	30.8	11	2.6	0.4					R	R
	0411-003NB	4	3.9	30.8	11	3.5	0.5		R	R		R	R
	0420-003NB			39.8	20				R	R		R	R
	0511-003NB	5	3.9	30.8	11	4.5	0.7	0.03	R	R		R	R
	0520-003NB			39.8	20				R	R		R	R
	0620-003NB	6	3.9	39.8	20	5.3	1.0		R	R		R	R
	0630-003NB			49.8	30				R	R		R	R
	0720-003NB	7	3.9	39.8	20	6.2	1.0		R	R		R	R
	0730-003NB			49.8	30				R	R		R	R
	VNB R/L 0206-02NB	2	3.9	26.5	6	1.8	0.25						R
	0311-02NB	3	3.9	30.8	11	2.6	0.4						R
	0411-02NB	4	3.9	30.8	11	3.5	0.5						R
	0420-02NB			39.8	20								R
	0511-02NB	5	3.9	30.8	11	4.5	0.7	0.2					R
	0520-02NB			39.8	20								R
	0620-02NB	6	3.9	39.8	20	5.3	1.0						R
	0630-02NB			49.8	30								R
	0720-02NB	7	3.9	39.8	20	6.2	1.0						R
	0730-02NB			49.8	30								R
	VNBT R/L 0411-003	4	3.9	30.8	11	3.6	1.0	0.03		R		R	R
	0420-003			39.8	20					R		R	R
	0511-003	5	3.9	30.8	11	4.6	1.3			R		R	R
	0520-003			39.8	20					R		R	R
	VNBT R/L 0411-01	4	3.9	30.8	11	3.6	1.0	0.1				R	R
	0420-01			39.8	20							R	R
	0511-01	5	3.9	30.8	11	4.6	1.3					R	R
	0520-01			39.8	20							R	R

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

Micro Internal Grooving

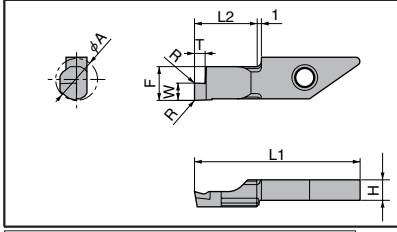
See Page. 230 for Details

Shape (Right-hand Shown)	Description	Min. Cutting Dia.	Dimension (mm)								Insert Grade				
											Cermet	PVD Coated			Carbide
		φA	W	R	H	L1	L2	L3	F	T	TC60	PR630	PR915	PR930	KW10
	VNGR/L 0410-11	4	1.0	0.05	3.9	30.8	11	0.1	3.5	0.8				R	R
	0420-11		2.0	0.1										R	R
	0510-11	5	1.0	0.05	3.9	30.8	11	0.1	4.4	1.0	R	R		R	R
	0520-11		2.0	0.1							R	R		R	R
	0610-20	6	1.0	0.05	3.9	39.8	20	0.3	5.2	1.8	R	R		R	R
	0620-20		2.0	0.1							R	R		R	R
	0710-20	7	1.0	0.05	3.9	39.8	20	0.3	6.2	2.0	R	R		R	R
	0720-20		2.0	0.1							R	R		R	R

· Dimension T shows available grooving depth.
· L3 Dimension means the cutting edge is above the tool's center position.

Micro Face Grooving

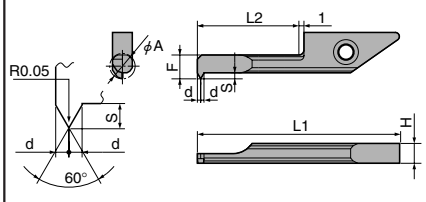
See Page. 245 for Details

Shape (Right-hand Shown)	Description	Min. Cutting Dia.	Dimension (mm)							Insert Grade				
										Cermet	PVD Coated			Carbide
		φA	W±0.03	R	H	L1	L2	F	T	TC60	PR630	PR915	PR930	KW10
	VNFGR/L 0810-10	8	1.0	0.05	3.9	29.6	10	7.3	2.0	R	R		R	R
	0820-10	8	2.0	0.05	3.9	29.6	10	7.3	2.0	R	R		R	R
	0830-10	8	3.0	0.05	3.9	29.6	10	7.3	3.0	R	R		R	R

· Dimension T shows available grooving depth.

Micro Internal Threading

See Page. 294 for Details

Shape (Right-hand Shown)	Description	Min. Bore Dia.	Dimension (mm)							Insert Grade				
										Cermet	PVD Coated			Carbide
		φA	H	L1	L2	F	S	d		TC60	PR630	PR915	PR930	KW10
	VNTR/L 045-11	4.5	3.9	30.8	11	3.6	1.3	0.6					R	R
	060-11	6.0	3.9	30.8	11	4.6	1.6	0.8					R	R

Micro Boring

See Page. 158 for Details

Shape (Right-hand Shown)	Description	Min. Bore Dia.	Dimension (mm)							Insert Grade			
										Cermet	PVD Coated		Carbide
		φA	φD	H	L1	L2	L3	F	S	TC60	PR630	PR930	KW10
PSBR/L 0202 and PSBR/L 0303 type shows Right Figure	PSBR/L 0202-50S	2	1.8	–	50	–	5	0.9	0.25			●	R
	0303-50S	3	2.8	–	50	–	7	1.4	0.3			●	R
	0404-60S	4	3.8	3.6	60	30	10	1.9	0.5	R	○	●	●
	0505-70S	5	4.8	4.4	70	40	12	2.4	0.5	●	○	●	●
	0606-70S	6	5.8	5.2	70	45	12	2.9	0.5	R	○	○	●
	0707-80S	7	6.8	6.2	80	50	12	3.4	0.5	●	○	○	●
	PSBR/L 0202-50NBS	2	1.8	–	50	–	5	0.9	0.25			R	●
	0303-50NBS	3	2.8	–	50	–	7	1.4	0.3			R	●
	0404-60NBS	4	3.8	3.6	60	30	10	1.9	0.5	●	R	R	●
	0505-70NBS	5	4.8	4.4	70	40	12	2.4	0.5	R	R	R	●
	0606-70NBS	6	5.8	5.2	70	45	12	2.9	0.5	R	R	R	R
	0707-80NBS	7	6.8	6.2	80	50	12	3.4	0.5	R	R	R	R
	PSBTR/L 0415-60S	4	3.8	3.6	60	20	8	1.9	1.0		R	●	○
	0515-70S	5	4.8	4.6	70			2.4	1.3		R	●	○

Cermet, Coated, Carbide
-NBS Shape

Micro Internal Grooving

See Page. 231 for Details

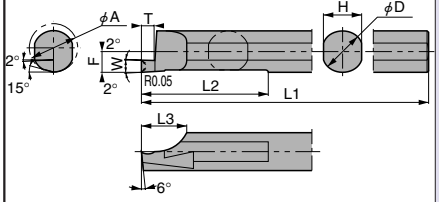
Shape (Right-hand Shown)	Description	Min. Cutting Dia.	Dimension (mm)										Insert Grade			
													Cermet	PVD Coated		Carbide
		φA	W±0.03	C	φD	H	L1	L2	L3	L4	F	T	TC60	PR630	PR930	KW10
	PSGR/L 0510-60S	5	1.0	0.05	3.8	3.6	60	15	8	0.1	1.86	1.5				●
	0520-60S		2.0	0.1												●
	PSGR/L 0610-70S	6	1.0	0.05	4.8	4.4	70	20	8	0.3	2.36	2.0	○	R	○	●
	0620-70S		2.0	0.1									○	R	○	●
	PSGR/L 0710-70S	7	1.0	0.05	5.8	5.2	70	20	10	0.3	2.86	2.0	○	R	○	●
	0720-70S		2.0	0.1									○	R	R	●
	PSGR/L 0810-80S	8	1.0	0.05	6.8	6.2	80	25	10	0.3	3.38	2.0	○	○	○	R
	0820-80S		2.0	0.1									○	○	○	●

· Dimension T shows available grooving depth.
· L4 Dimension means the cutting edge is above the tool's center position.

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

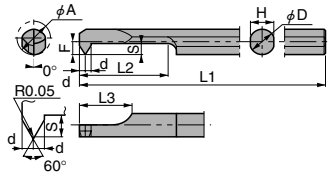
■ Micro Face Grooving

See Page. 246 for Details

Shape (Right-hand Shown)	Description	Min. Cutting Dia.	Dimension (mm)							Insert Grade			
										Cermet	PVD Coated		Carbide
		φA	W±0.03	φD	H	L1	L2	L3	F	TC60	PR630	PR930	KW10
	PSFGR/L 0810-20S 0820-20S 0830-20S	8	1.0 2.0 3.0	6.8	6.2	80	25.5	7	3.4	L ○ ○	○ ○ ○	○ ○ ○	● ● ●

■ Micro Internal Threading

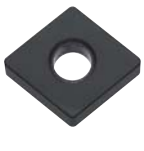
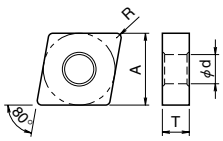
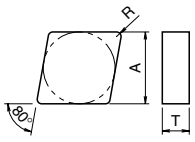
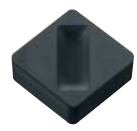
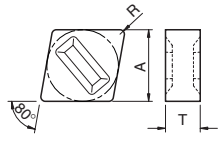
See Page. 295 for Details

Shape (Right-hand Shown)	Description	Min. Bore Dia.	Dimension (mm)									Insert Grade			
												Cermet	PVD Coated		Carbide
		φA	φD	H	L1	L2	L3	F	S	d		TC60	PR630	PR930	KW10
	PSTR/L 0604-60S	4.5	3.8	3.6	60	15	8	1.7	1.6	0.8					R
	PSTR/L 0805-70S	6.0	4.8	4.4	70	20	8	2.2	2.1	1.0					R

● : Std. Stock ○ : Check Availability R : R-hand Only L : L-hand Only

■ Negative

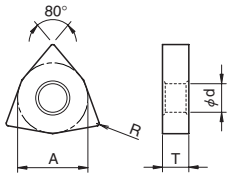
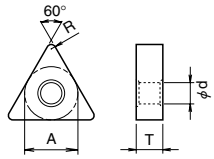
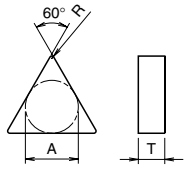
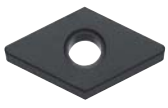
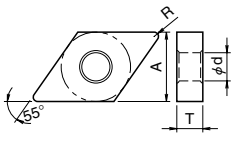
Edge Preparation			
KA30: Without Indication	0.10mm × 25°	-T01525	0.15mm × 25°
A65: Without Indication	0.20mm × 25°	-T02020	0.20mm × 20°
KS500: Without Indication	0.20mm × 25°	-T02025	0.20mm × 25°
KS6000: Without Indication	0.20mm × 25°	-T03030	0.30mm × 30°
A66N: Without Indication	0.15mm × 25°+ honing	-T05015	0.50mm × 15°+ honing
-T05 and TNGN11 Type	0.05mm × 20°	-T15030	1.50mm × 30°
-T30	0.30mm × 30°+ honing	K	2.0mm × 15° + 0.15mm × 25° + honing

Shape	Description	Dimension (mm)				Insert Grade						Ref. Page for Toolholder
						Alumina Ceramic			Silicon Nitride Ceramic		PVD Ceramic	
		A	T	ϕd	R	KA30		A65	KS500	KS6000	A66N	
 	**CNMA 120408** **120412**	12.70	4.76	5.16	0.8 1.2						○	95 189
	CNMA 120408-T30 **120412-T30**	12.70	4.76	5.16	0.8 1.2						○ ○	
	CNGA 120404 **120408** **120412** **120416**	12.70	4.76	5.16	0.4 0.8 1.2 1.6	 ●		● ● ●	 ● ● ●	 ● ● 	● ● ● 	
	CNGA 120404-T05 **120408-T05** **120412-T05**	12.70	4.76	5.16	0.4 0.8 1.2	 ○						
	CNGA 120404-T30 **120408-T30** **120412-T30**	12.70	4.76	5.16	0.4 0.8 1.2						○ ○ ●	
	CNGA 120404T01525 **120408T01525** **120412T01525**	12.70	4.76	5.16	0.4 0.8 1.2						● ● ●	
	CNGA 120408T05015 **120412T05015** **120416T05015**	12.70	4.76	5.16	0.8 1.2 1.6				● ● ●			
	CNGA 160612 **160616**	15.875	6.35	6.35	1.2 1.6				● ●	● 		95
 	**CNMN 120708** **120712**	12.70	7.94	–	0.8 1.2			● ●				108
	CNGN 120404 **120408** **120412** **120416**	12.70	4.76	–	0.4 0.8 1.2 1.6	 ○ ○ ●		● 	 ○ ● ●	 ○ ● ●		
	CNGN 120412T02020	12.70	4.76	–	1.2				●			
	CNGN 120416T05015	12.70	4.76	–	1.6					●		
	CNGN 120704 **120708** **120712** **120716**	12.70	7.94	–	0.4 0.8 1.2 1.6			● ○ ○ ○	 ● ● ●		 ● ● ●	
	CNGN 120712T01525 **120716T01525**	12.70	7.94	–	1.2 1.6						● ●	
	CNGN 120708T02025 **120708T02025** **120708T02025**	12.70	7.94	–	0.8 1.2 1.6					● ● ●		
	CNGN 160612	15.875	6.35	–	1.2					●		–
	CNGN 160708 **160712** **160716**	15.875	7.94	–	0.8 1.2 1.6			○ ○ ●	○ ○ ○	 ●	 ○	108
 	**CNGX 120712T02025** **120716T02025**	12.70	7.94	–	1.2 1.6					● ●		–

● : Std. Stock ○ : Check Availability

■ Negative

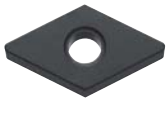
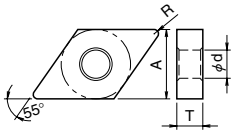
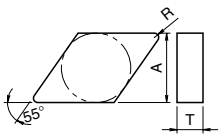
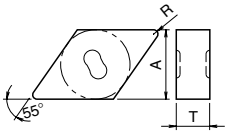
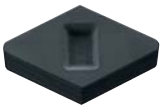
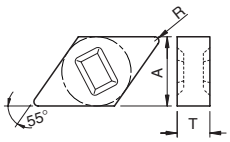
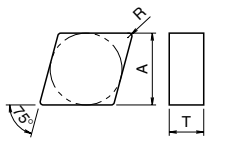
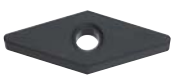
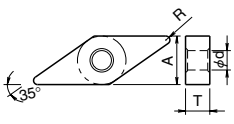
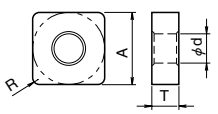
Edge Preparation			
KA30: Without Indication	0.10mm × 25°	-T01525	0.15mm × 25°
A65: Without Indication	0.20mm × 25°	-T02020	0.20mm × 20°
KS500: Without Indication	0.20mm × 25°	-T02025	0.20mm × 25°
KS6000: Without Indication	0.20mm × 25°	-T03030	0.30mm × 30°
A66N: Without Indication	0.15mm × 25°+ honing	-T05015	0.50mm × 15°+ honing
-T05 and TNGN11 Type	0.05mm × 20°	-T15030	1.50mm × 30°
-T30	0.30mm × 30°+ honing	K	2.0mm × 15° + 0.15mm × 25° + honing

Shape	Description	Dimension (mm)				Insert Grade						Ref. Page for Toolholder
						Alumina Ceramic			Silicon Nitride Ceramic		PVD Ceramic	
		A	T	φd	R	KA30		A65	KS500	KS6000	A66N	
												
	WNGA 080408	12.70	4.76	5.16	0.8						●	96 191
	WNGA 080404T01525	12.70	4.76	5.16	0.4						●	
	080408T01525				0.8						●	
	080412T01525				1.2						●	
	WNGA 080408T02025	12.70	4.76	5.16	0.8				●			
	080412T02025				1.2				●	●		
	080416T02025				1.6				●			
												
	TNGA 160404	9.525	4.76	3.81	0.4			●			●	97 194
	160408				0.8	●		●	●	○	●	
	160412				1.2				●	○	●	
	160416				1.6				●			
	160420				2.0				○			
	TNGA 160408-T05	9.525	4.76	3.81	0.8	○						
	160412-T05				1.2							
	TNGA 160408-T30	9.525	4.76	3.81	0.8						●	
	160412-T30				1.2						○	
	TNGA 160404T01525	9.525	4.76	3.81	0.4						●	
	160408T01525				0.8						●	
	160412T01525				1.2						●	
	TNGA 220412T05015	12.70	4.76	5.16	1.2				●			97
												
	TNGN 110304	6.35	3.18	–	0.4			●				452 457
	110308				0.8			○			●	
	110312				1.2			○				
	TNGN 110304T01525	6.35	3.18	–	0.4						●	
	110308T01525				0.8						●	
	110312T01525				1.2						●	
	TNGN 160404	9.525	4.76	–	0.4	●		○			○	109
	160408				0.8	●		○	○	●	●	
	160412				1.2	●		○	○	●	●	
	160416				1.6	●			○	●		
	160420				2.0	●			○			
	TNGN 160404-T05	9.525	4.76	–	0.4	○		○				
	160408-T05				0.8	○		○				
	160412-T05				1.2	○						
	160416-T05				1.6	○						
	160420-T05				2.0	○						
	TNGN 160404T01525	9.525	4.76	–	0.4						●	
	160408T01525				0.8						●	
	TNGN 160704	9.525	7.94	–	0.4			○				
	160708				0.8			●			●	
	160712				1.2			○			●	
	160716				1.6			○			●	
	160720				2.0			○				
												
	DNGA 150404	12.70	4.76	5.16	0.4			○	○		○	99
	150408				0.8	○		○	○		●	
	150412				1.2	●						
	DNGA 150404-T30	12.70	4.76	5.16	0.4							
	150408-T30				0.8						○	
	DNGA 150412T01525	12.70	4.76	5.16	1.2						●	

● : Std. Stock ○ : Check Availability

■ Negative

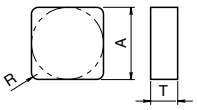
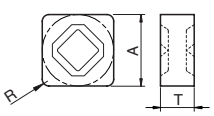
Edge Preparation			
KA30: Without Indication	0.10mm × 25°	-T01525	0.15mm × 25°
A65: Without Indication	0.20mm × 25°	-T02020	0.20mm × 20°
KS500: Without Indication	0.20mm × 25°	-T02025	0.20mm × 25°
KS6000: Without Indication	0.20mm × 25°	-T03030	0.30mm × 30°
A66N: Without Indication	0.15mm × 25°+ honing	-T05015	0.50mm × 15°+ honing
-T05 and TNGN11 Type	0.05mm × 20°	-T15030	1.50mm × 30°
-T30	0.30mm × 30°+ honing	K	2.0mm × 15° + 0.15mm × 25° + honing

Shape	Description	Dimension (mm) A	T	φd	R	Insert Grade: Alumina Ceramic KA30		A65	Silicon Nitride Ceramic KS500	KS6000	PVD Ceramic A66N	Ref. Page for Toolholder
 	**DNGA 150604**	12.70	6.35	5.16	0.4			●			●	99
	150608				0.8			●	●		●	
	150612				1.2			●			●	
	150616				1.6						●	
	DNGA 150604T01525	12.70	6.35	5.16	0.4						●	
	150608T01525				0.8						●	
	150612T01525				1.2						●	
 	**DNGN 150404**	12.70	4.76	–	0.4	○			○			–
	150408				0.8	○			○			
	150412				1.2	●			○			
	150416				1.6	○			○			
	DNGN 150704	12.70	7.94	–	0.4			○			●	110
	150708				0.8			●			●	
	150712				1.2			○			●	
	150716				1.6			○				
 	**DNMX 120704**	10.00	7.94	–	0.4							110
	120708				0.8							
 	**DNGX 150712T02025**	12.70	7.94	–	1.2					●		–
	150716T02025				1.6					●		
 	**ENGN 130704**	12.70	7.94	–	0.4			●				111 198
	130708				0.8			●	○		●	
	130712				1.2			●	○		●	
	130716				1.6			●				
	130720				2.0			●				
	130730				3.0			●				
 	**VNMA 160404**	9.525	4.76	3.81	0.4							100 101
	160408				0.8						○	
	VNGA 160404	9.525	4.76	3.81	0.4			●			●	
	160408				0.8			●			●	
	VNGA 160404T01525	9.525	4.76	3.81	0.4						●	
	160408T01525				0.8						●	
	160412T01525				1.2						●	
	VNGA 160408T02025	9.525	4.76	3.81	0.8						●	
	VNGA 160416T03030	9.525	4.76	3.81	1.6						●	
 	**SNMA 120408-T30**	12.70	4.76	5.16	0.8						○	102 103
	120412-T30				1.2							
	SNGA 120404	12.70	4.76	5.16	0.4						●	
	120408				0.8			○	●	●	●	
	120412				1.2			●	●	●	●	
	120416				1.6				●	○		
	120420				2.0				●			
	SNGA 120408T01525	12.70	4.76	5.16	0.8						●	
	120412T01525				1.2						●	
	SNGA 120412T05015	12.70	4.76	5.16	1.2				●			

● : Std. Stock ○ : Check Availability

■ Negative

Edge Preparation			
KA30: Without Indication	0.10mm × 25°	-T01525	0.15mm × 25°
A65: Without Indication	0.20mm × 25°	-T02020	0.20mm × 20°
KS500: Without Indication	0.20mm × 25°	-T02025	0.20mm × 25°
KS6000: Without Indication	0.20mm × 25°	-T03030	0.30mm × 30°
A66N: Without Indication	0.15mm × 25°+ honing	-T05015	0.50mm × 15°+ honing
-T05 and TNGN11 Type	0.05mm × 20°	-T15030	1.50mm × 30°
-T30	0.30mm × 30°+ honing	K	2.0mm × 15° + 0.15mm × 25° + honing

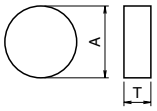
Shape	Description	Dimension (mm)				Insert Grade						Ref. Page for Toolholder
						Alumina Ceramic			Silicon Nitride Ceramic		PVD Ceramic	
		A	T	φd	R	KA30		A65	KS500	KS6000	A66N	
 	SNMN 120408	12.70	4.76	–	0.8							112 113 198 453 454
	SNMN 120412				1.2				●			
	SNMN 120416				1.6							
	SNMN 120708	12.70	7.94	–	0.8			●				
	SNMN 120712				1.2			●				
	SNMN 120716				1.6			●				
	SNGN 120404	12.70	4.76	–	0.4	●		○				
	SNGN 120408				0.8	●		○	●		○	
	SNGN 120412				1.2	●		●	●	●	●	
	SNGN 120416				1.6	●		○	●	●	●	
	SNGN 120420				2.0	●		○	●	○		
	SNGN 120432				3.2			●				
	SNGN 120408-T05	12.70	4.76	–	0.8			○				
	SNGN 120412-T05				1.2	○						
	SNGN 120416-T05				1.6	○						
	SNGN 120408-T30	12.70	4.76	–	0.8							
	SNGN 120412-T30				1.2						●	
	SNGN 120416-T30				1.6						○	
	SNGN 120412T01525	12.70	4.76	–	1.2						●	
	SNGN 120416T05015	12.70	4.76	–	1.6				●	●		
	SNGN 120704	12.70	7.94	–	0.4	●		○			●	
	SNGN 120708				0.8	●		●	○		●	
	SNGN 120712				1.2	●		●	○		●	
	SNGN 120716				1.6	●		○	●	●	●	
	SNGN 120720				2.0			○	○		●	
	SNGN 120730				3.0						●	
	SNGN 120720T01525	12.70	7.94	–	2.0						●	
	SNGN 120708T02025	12.70	7.94	–	0.8					●		
	SNGN 120712T02025				1.2					●		
	SNGN 120724T15030	12.70	7.94	–	2.4			●			●	
	SNGN 150712	15.875	7.94	–	1.2			○	●			112 113
	SNGN 150716				1.6			○				
	SNGN 150720				2.0				○			
	SNGN 150716T02020	15.875	7.94	–	1.6				●			
	SNGN 150712T02025	15.875	7.94	–	1.2					●		
	SNGN 150716T02025				1.6					●		
	SNGN 190720	19.05	7.94	–	2.0							–
	SNGN 190724				2.4					●		
	SNGN 190720K	19.05	7.94	–	2.0			●				
	SNGN 190724K				2.4					●	●	
	SNGN 250724T05015	25.40	7.94	–	2.4			●			●	
	SNGN 250724K	25.40	7.94	–	2.4			●		●	●	
 	SNGX 120708T02025	12.70	7.94	–	0.8					●		–
	SNGX 120712T02025				1.2					●		
	SNGX 120716T02025				1.6					●		
	SNGX 150712T02025	15.875	7.94	–	1.2					●		
	SNGX 150716T02025				1.6					●		

● : Std. Stock ○ : Check Availability

Turning Indexable Inserts

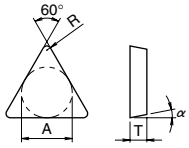
Negative

Edge Preparation			
KA30: Without Indication	0.10mm × 25°	-T01525	0.15mm × 25°
A65: Without Indication	0.20mm × 25°	-T02020	0.20mm × 20°
KS500: Without Indication	0.20mm × 25°	-T02025	0.20mm × 25°
KS6000: Without Indication	0.20mm × 25°	-T03030	0.30mm × 30°
A66N: Without Indication	0.15mm × 25°+ honing	-T05015	0.50mm × 15°+ honing
-T05 and TNGN11 Type	0.05mm × 20°	-T15030	1.50mm × 30°
-T30	0.30mm × 30°+ honing	K	2.0mm × 15° + 0.15mm × 25° + honing

Shape	Description	Dimension (mm) A	T	ϕd	R	Insert Grade: Alumina Ceramic KA30		A65	Silicon Nitride Ceramic KS500	KS6000	PVD Ceramic A66N	Ref. Page for Toolholder
 	**RNGN 060300T01525**	6.00	3.18	–	–						●	–
	RNGN 090300T01525	9.525	3.18	–	–						●	–
	RNGN 090400	9.525	4.76	–	–			●			●	455
	RNGN 120400 **120400T01525**	12.70	4.76	–	–			●	●	○	○ ●	
	RNGN 120700 **120700-T30** **120700T01525** **120700K**	12.70	7.94	–	–			●	●	●	● ● ● ●	114 455
	RNGN 150700	15.875	7.94	–	–			●			●	114
	RNGN 250700K	25.40	7.94	–	–						●	–

Positive

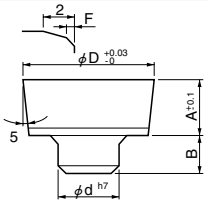
Edge Preparation			
A65: Without Indication	0.08mm × 20°		
A66N: Without Indication	0.08mm × 20°	-T01525	0.15mm × 25°

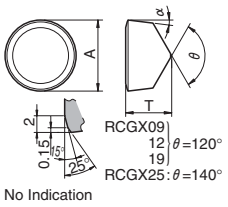
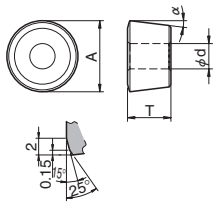
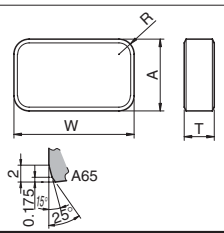
Shape	Description	Dimension (mm) A	T	R	Angle (°) α	Insert Grade: Alumina Ceramic KA30		A65	Silicon Nitride Ceramic KS500	KS6000	PVD Ceramic A66N	Ref. Page for Toolholder
 	**TBGN 060102** **060104** **060108**	3.97	1.59	0.2 0.4 0.8	5°						● ● ●	197 456
	TCGN 160404 **160408**	9.525	4.76	0.4 0.8	7°			○ ○				197
	TPGN 110302 **110304** **110308**	6.35	3.18	0.2 0.4 0.8	11°			● ● ●			● ● ●	
	TPGN 110304T01525 **110308T01525** **110312T01525**	6.35	3.18	0.4 0.8 1.2	11°						● ● ●	133 179
	TPGN 160302 **160304** **160308** **160312**	9.525	3.18	0.2 0.4 0.8 1.2	11°			● ● ● ○			 ● ● ●	
 	**SPGN 090304** **090308**	9.525	3.18	0.4 0.8	11°			○			● ●	143
	SPGN 120304 **120308** **120312**	12.70	3.18	0.4 0.8 1.2	11°			● ○ ○			● ● ●	144 187
	SPGN 190412	19.05	4.76	1.2	11°					●		–

● : Std. Stock ○ : Check Availability

■ Inserts for High Hardened Roll

Edge Preparation	
A65 / A66N	See Figure below

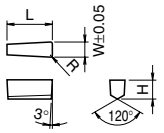
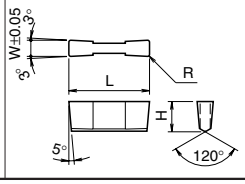
Shape		Description	Dimension (mm)					Insert Grade						Ref. Page for Toolholder
								Alumina Ceramic			Silicon Nitride Ceramic		PVD Ceramic	
			φD	φd	A	B	F	KA30		A65	KS500	KS6000	A66N	
		**RBG 12W**	12	6	6	3	0.2							–
		16W	16	8	8	5	0.2			○				
		20W	20	10	10	5	0.3			○				
		26W	26	14	10	5	0.3							
		32W	32	16	15	6	0.4							

Shape		Description	Dimension (mm)				Angle (°)	Insert Grade						Ref. Page for Toolholder
								Alumina Ceramic			Silicon Nitride Ceramic		Coated Ceramic	
			A	T	φd	R	α	KA30		A65	KS500	KS6000	A66N	
		**RCGX 090700**	9.525	8.0	–	–	7°			●			●	–
		RCGX 120700	12.70	8.0	–	–	7°			●			●	
		120700T01525											●	
		RCGX 191000	19.05	10.0	–	–	7°			●				
		RCGX 251200	25.40	12.0	–	–	7°			●				
		**RCMA 251200**	25.40	12.70	6.76	–	7°			●				–
		**LNUN 381232**	19.05	12.70	W= 38.10	3.2	–			●				–

● : Std. Stock ○ : Check Availability

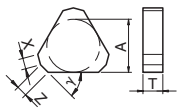
Grooving Inserts

Edge Preparation	
A65 / A66N	0.1mm × 20°

Shape		Description		Dimension (mm) W	R	L	H		Insert Grade: Alumina Ceramic KA30		A65	Silicon Nitride Ceramic KS500	KS6000	PVD Ceramic A66N	Ref. Page for Toolholder
		**GS**	**91-4**	4.0	0.5	12	5.0								217
			91-5	5.0	0.5	15	7.5				○				
			91-6	6.0	0.8	15	7.5								
			91-7	7.0	0.8	15	7.5								
			91-8	8.0	0.8	15	7.5				○				
		**GH**	**4020-05**	4.0							○			●	214 239
			5020-05	5.0							○			●	
			6020-05	6.0	0.5	20	7.5				○			●	
			7020-05	7.0							○			●	
			8020-05	8.0							-			●	

Milling Inserts

Edge Preparation	
KS500 / KS6000	0.20mm × 15°

Shape		Description		Dimension (mm) A	T	X	Z	Angle (°) γ	Insert Grade: Alumina Ceramic KA30		A65	Silicon Nitride Ceramic KS500	KS6000	PVD Ceramic A66N	Ref. Page for Toolholder
		**TNCN**	**1204ANT**	12.70	4.76	2.6	2.6	45°				●	●		–

● : Std. Stock ○ : Check Availability

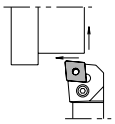
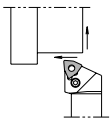
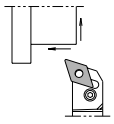
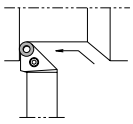
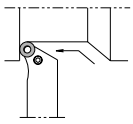
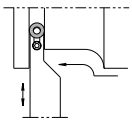
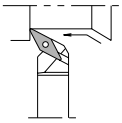
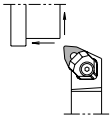
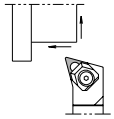
Turning

89~116

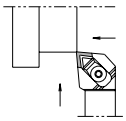
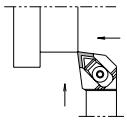
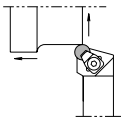
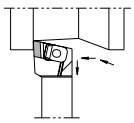
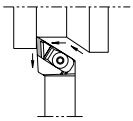
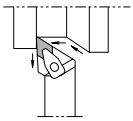
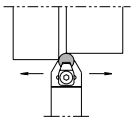
※See Page.451-455 of Toolholders for Solid CBN Tools.

Product Lineup

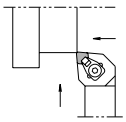
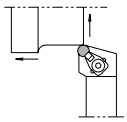
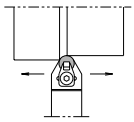
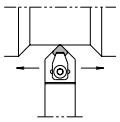
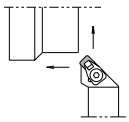
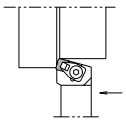
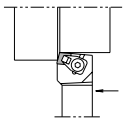
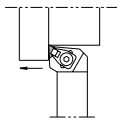
■ Toolholders for General Purpose

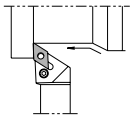
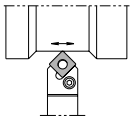
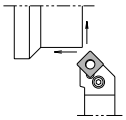
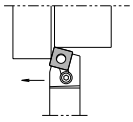
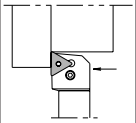
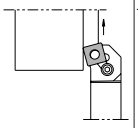
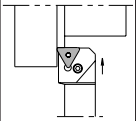
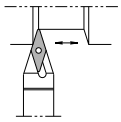
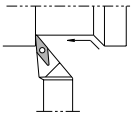
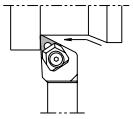
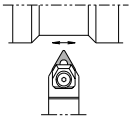
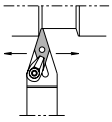
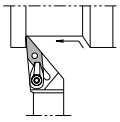
Application	External/Facing		External/Facing/Copying				External/Facing/ Copying/Undercutting	
Cutting Edge Angle	95°		105°	107.5°	Special			117.5°
Lever Lock	 PCLN	 PWLN		 PDHN	 PRGN	 PRGC	 PRXC		
Ref. Page	95	96		99	104	105	105		
Pin Lock								 PVPN	
Ref. Page								100	
Wedge Lock		 WWLN	 WTKN-N						
Ref. Page		96	98						
Multi Lock									
Ref. Page									

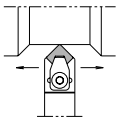
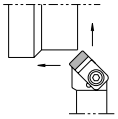
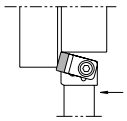
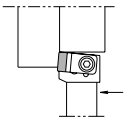
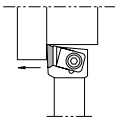
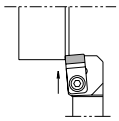
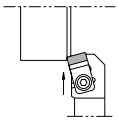
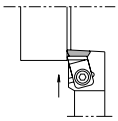
■ Toolholders for Ceramic Tools

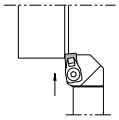
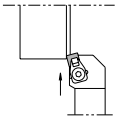
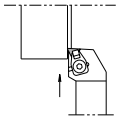
Application	External/Facing				External/Copying				
Cutting Edge Angle	95°	97.5°	Special		93°			Special	
Top Clamp	 CCLN	 CELN	 CRSN		 CEJN	 CDJN	 CDJN-X	 CRDN	
Ref. Page	108	111	114		111	110	110	114	

■ Toolholders for Solid CBN Tools

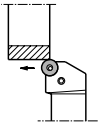
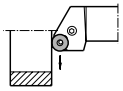
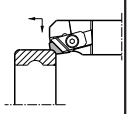
Application	External/Facing		External/Copying	External/Chamfering	External/Facing/ Chamfering	External		
Cutting Edge Angle	95°	Special	Special	45°	45°	75°		93°
Top Clamp	 CCLN-A	 CRSN-A	 CRDN-A	 CSDN-A	 CSSN-A	 CSRN-A	 CCRN-A	 CTJN-A
Ref. Page								

External/Copying			External/Chamfering		External/Facing /Chamfering	External		Facing	
72.5°	93°	95°	45°	60°	45°	75°	91°	15°	-1°
	 PDJN		 PSDN		 PSSN	 PSBN	 PTGN	 PSKN	 PTFN
	99		103		103	102	97	102	97
 PVVN		 PVLN							
100		110							
	 WTJN-N			 WTEN-N					
	98			98					
 MVVN		 MVLN							
111		111							

External/Chamfering	External/Facing/ Chamfering	External				Facing			
45°	45°	75°	85°	93°		5°	15°	-3°	
 CSDN	 CSSN	 CSRN	 CS-N	 CTJN		 CSYN	 CSKN	 CTUN	
113	112	112	112	109		112	112	109	

Facing		
5°	15°	-3°
 CSYN-A	 CSKN-A	 CTUN-A

■ Toolholders for Bearing Machining

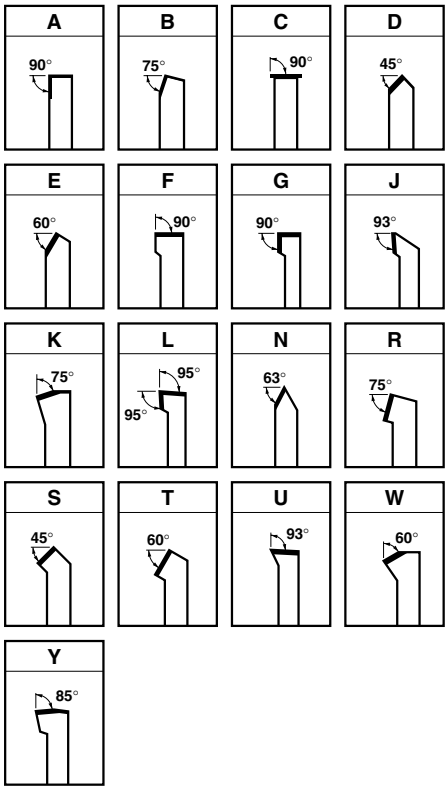
Application	External	Facing	External Round Chamfering
Cutting Edge Angle	Special	Special	Special
Lever Lock	 PRGC-BE	 PRGC-BF	
Ref. Page	106	106	
Top Clamp			 CBSN
Ref. Page			107

Turning Toolholders Identification System (Square Shank)

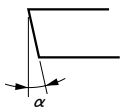
Clamping System	Insert Shape	Hand of Tool	Shank Height	Shank Width	Others
A: Anchor Style **C**: Clamp Only **M**: Clamp and Locking Pin **P**: Locking Pin Only (or Lever Lock) **S**: Screw Only **W**: Wedge Lock	**R** : Round **S** : 90° Square **T** : 60° Triangle **C** : 80° Rhombic **D** : 55° Rhombic **V** : 35° Rhombic **W** : 80° Trigon	**R**: Right-hand **L**: Left-hand **N**: Neutral	Shank Height	Shank Width	Optional Code Optional Mark or Number

P	C	L	N	R	20	20	K	—	12	

Cutting Edge Angle

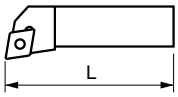


Insert Relief Angle



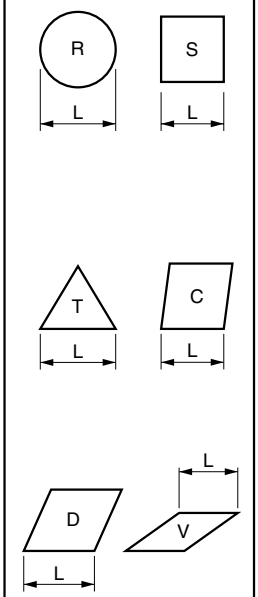
B : 5° Positive
C : 7° Positive
D : 15° Positive
E : 20° Positive
N : 0° Negative
P : 11° Positive

Toolholder Length



A : 32	**J** : 110	**S** : 250
B : 40	**K** : 125	**T** : 300
C : 50	**L** : 140	**U** : 350
D : 60	**M** : 150	**V** : 400
E : 70	**N** : 160	**W** : 450
F : 80	**P** : 170	**Y** : 500
G : 90	**Q** : 180	**X** : Special
H : 100	**R** : 200	

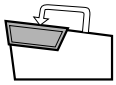
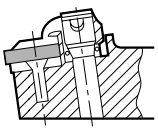
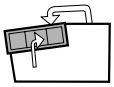
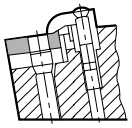
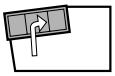
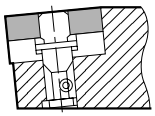
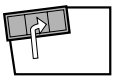
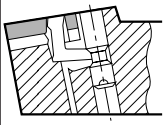
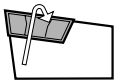
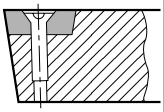
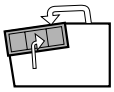
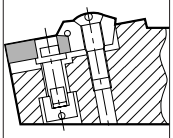
Insert Size



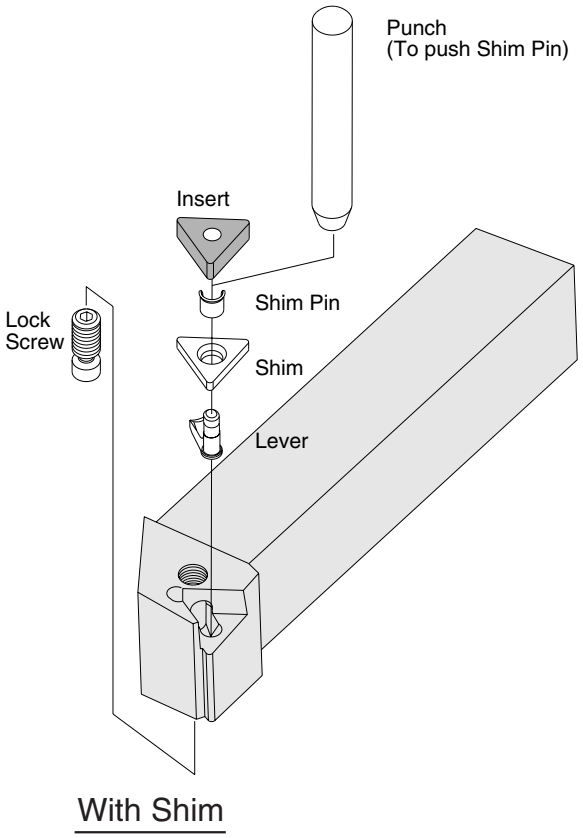
● Specification may change without any prior notice.

Clamping System

■ Clamping System

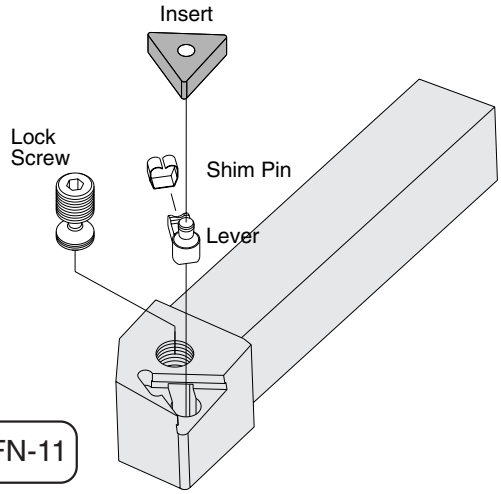
Name	Mechanism		Feature	Name	Mechanism		Feature
Top Clamp (C)			· Rigid Clamping · Negative Insert: Medium to Heavy Cutting (Mainly for Ceramic Insert) · Positive Insert: Low Cutting Resistance	Multi Lock (M)			· Combination of Top Clamp and Pin Lock · Rigid Clamping · Heavy Cutting
Pin Lock (P)			· Firm Clamping · High Precision · Easy Insert Replacement	Lever Lock (P)			· Firm Clamping · High Precision · Easy Insert Replacement · For General Use
Screw Clamp (S)			· Simple Mechanism · Less Parts · Finishing to Medium Cutting	Wedge Lock (W)			· Rigid Clamping · Heavy Cutting

● Lever Lock



With Shim

PCLN
PWLN
PTGN-16·22 / PTFN-16·22
PDJN / PDHN
PSBN / PSKN / PSSN / PSDN
PRGN
PRGC / PRXC

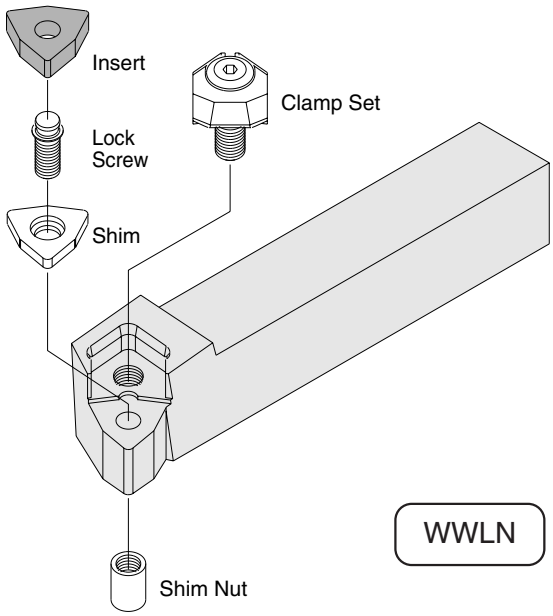


PTGN-11 / PTFN-11

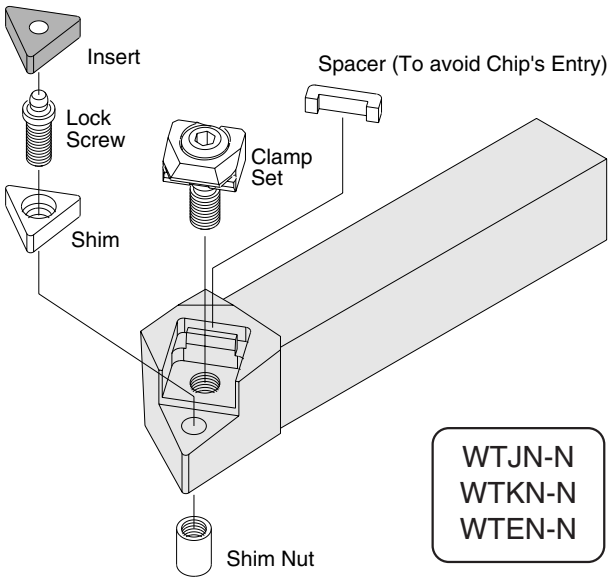
Without Shim

Clamping System

● Wedge Lock

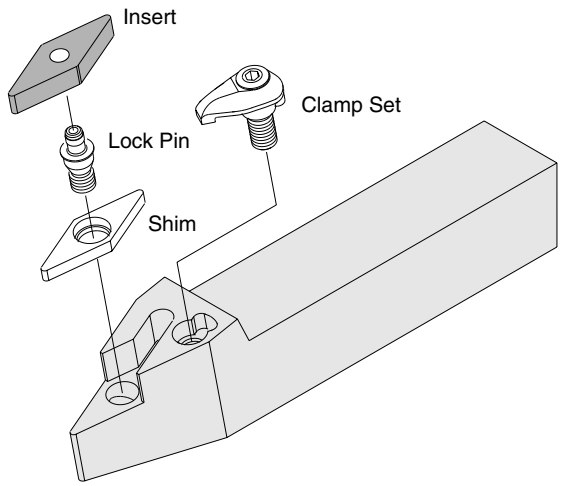


WWLN



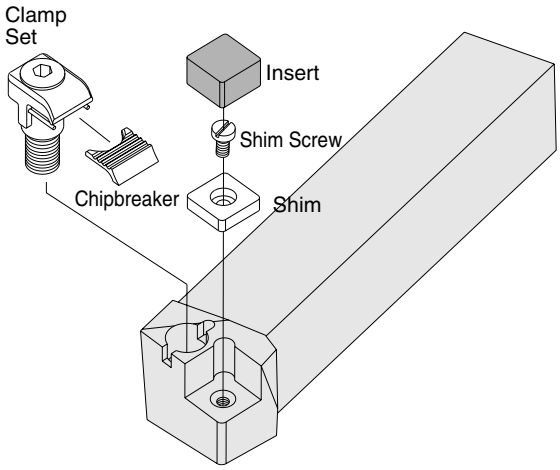
WTJN-N
WTKN-N
WTEN-N

● Multi Lock



MVLN
MVVN

● Top Clamp

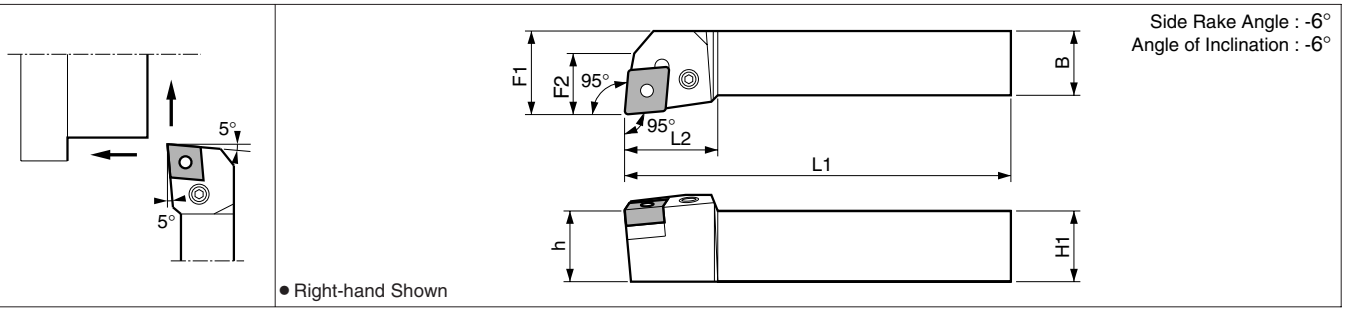


CCLN
CTJN / CTUN
CDJN
CEJN / CELN
CSRN / CS-N / CSKN
CSYN / CSSN / CSDN
CRSN / CRDN

※ Chipbreaker is not attached to CRSN, CRDN types.

Toolholders for General Purpose [CN□□ Insert] Lever Lock

■ PCLN (External/Facing)



Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PCLN R/L	1616H-09	●		●	16	16	100	22	20	14							
	2020K-09	●		●	20	20	125	22	25	15	0.8	LL-1	LS-1	LC-32	LSP-1	PC-1	FH-2.5
	2525M-09	●		●	25	25	150	22	32	18							
	1616H-12	●		●	16	16	100	27	20	17							
	2020K-12	●		●	20	20	125	27	25	20							
	2525M-12	●		●	25	25	150	27	32	20	0.8	LL-2	LS-2	LC-42	LSP-2	PC-2	LW-3
	3225P-12	●		●	32	25	170	27	32	20							
	2525M-16	●		●	25	25	150	32	32	25							
	3232P-16	●		●	32	32	170	32	40	25	0.8	LL-5	LS-4	LC-53	LSP-3	-	LW-3
	3232P-19	●			32	32	170	40	40	27	0.8	LL-6	LS-5	LC-63	LSP-4	-	LW-4

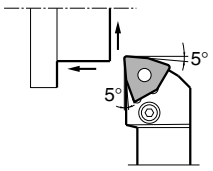
● Applicable Insert

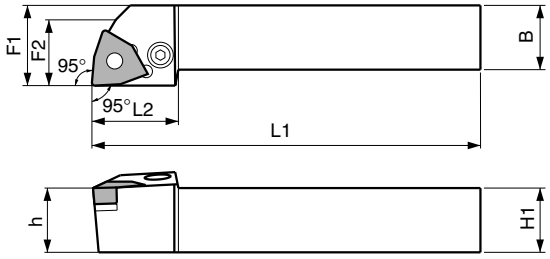
Toolholder	Insert	
PCLN R/L...-09	CNMG CNMM CNGG CNMA CNGA	0904..
PCLN R/L...-12		1204..
PCLN R/L...-16		1606..
PCLN R/L...-19		1906..

Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing
Shape	GP	HQ	CQ	TK	WQ	GS	HS	CS
Size	09, 12	09, 12	12, 16	12	12	09, 12	12, 16, 19	12
Ref. Page	34	34	35	35	35	35	35	35
Application	Medium-Roughing	Roughing	Roughing	Finishing	Medium	Medium-Roughing	Soft Steel	Soft Steel
Shape	GT	Conventional	HX	R/L-S	R/L	R/L-25R	XP(-T)	XQ
Size	12	12, 16, 19	12, 16, 19	09	09, 12	12	12	12
Ref. Page	35	36	36	37	37	37	36	36
Application	Soft Steel	Stainless Steel	Stainless Steel	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	Non-ferrous Metal
Shape	XS	GU	SU	ST	ZS	No Chipbreaker	Ceramic	AH
Size	12	12	12	12	12	12, 16, 19	12, 16	12
Ref. Page	36	36	36	37	37	37	82	37
Application	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l					
Shape	A3	Diamond	CBN					
Size	12	12	12					
Ref. Page	37	459	442					

Toolholders for General Purpose [WN□□ Insert] Lever Lock/Wedge Lock

■ PWLN (External/Facing)

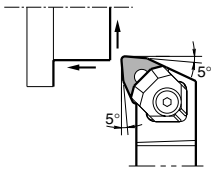


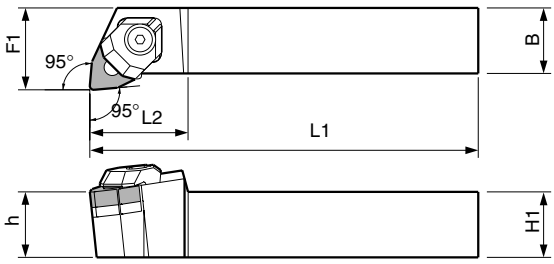


Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

■ WWLN (External/Facing)





Side Rake Angle : -6°
Angle of Inclination : -6°

WWLN□ 2020K Type:
Shim Nut sticks out
as below.

● Right-hand Shown

● Toolholder Dimension

Description		Stock			Dimension (mm)						Std. Corner-R	Spare Parts					
		R	N	L	H1=h	B	L1	L2	F1	F2		Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PWLN□	1616H-06	●		●	16	16	100	22	20	-							
	2020K-06	●		●	20	20	125	22	25	-	0.8	LL-1	LS-1	LW-32	LSP-1	PC-1	FH-2.5
	2525M-06	●		●	25	25	150	22	32	-							
	2020K-08	●		●	20	20	125	26	25	-	0.8	LL-2	LS-2	LW-42	LSP-2	PC-2	LW-3
	2525M-08	●		●	25	25	150	26	32	23							

● Toolholder Dimension

Description		Stock			Dimension (mm)						Std. Corner-R	Spare Parts					
		R	N	L	H1=h	B	L1	L2	F1			Clamp Set	Shim	Shim Pin	Shim Nut	Wrench	
WWLN□	2020K-08	●		●	20	20	125	30	25		1.2	WCS-8	WWN-42	WP5X15	WN-1	LW-3	
	2525M-08	●		●	25	25	150	30	32		1.2						

● Applicable Insert

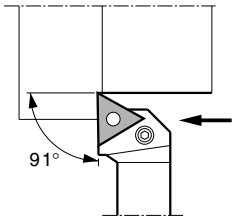
Toolholder	Insert	
PWLN□ ...-06	WNMG WNMM	0604..
PWLN□ ...-08	WNGG	0804..
WWLN□...-08	WNMA WNGA	0804..

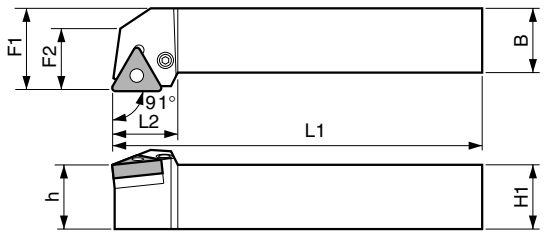
Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing
Shape	GP	HQ	CQ	TK	WQ	GS	HS	CS
Size	06, 08	06, 08	08	08	06, 08	06, 08	08	08
Ref. Page	38	38	38	38	38	39	39	39
Application	Medium-Roughing	Roughing	Finishing	Medium	Medium	Soft Steel	Soft Steel	Soft Steel
Shape	GT	Conventional	□-S	□	E□	XP	XQ	XS
Size	08	08	06	06	08	08	08	08
Ref. Page	39	39	40	40	40	39	39	39
Application	Stainless Steel	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Shape	GU	SU	ZS	No Chipbreaker	Ceramic	AH	Diamond	CBN
Size	08	08	08	08	08	08	08	08
Ref. Page	39	40	40	40	83	40	459	442, 443

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [TN□□ Insert] Lever Lock

■ PTGN (External)

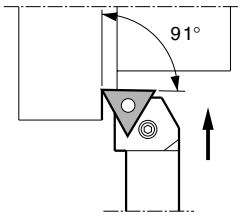


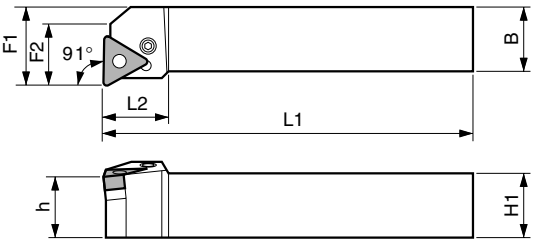


Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

■ PTFN (Facing)





Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PTGN R/L	1212F -11	●		●	12	12	80	18	16	12	0.8	LL-03	LS-03	-	P-03	-	FH-2
	1616H-11	○		○	16	16	100	22	20	14							
	2020K-11	○		○	20	20	125	22	25	20	0.8	LL-03T	LS-03S	-	P-03S	-	FH-2.5
	2525M-11	○		○	25	25	150	22	32	22							
	1616H-16	○		○	16	16	100	24	20	17							
	2020K-16	●		●	20	20	125	24	25	20	0.8	LL-1	LS-1	LT-32	LSP-1	PC-1	FH-2.5
	2525M-16	●		●	25	25	150	24	32	20							
	2525M-22	●		●	25	25	150	29	32	24	0.8	LL-2	LS-2	LT-42	LSP-2	PC-2	LW-3
	3225P -22	●		●	32	25	170	29	32	24							
PTFN R/L	1212F -11	●		●	12	12	80	15	16	12	0.8	LL-03	LS-03	-	P-03	-	FH-2
	1616H-11	○		○	16	16	100	22.5	20	15							
	2020K-11	○		○	20	20	125	22.5	25	19	0.8	LL-03T	LS-03S	-	P-03S	-	FH-2.5
	2525M-11	○		○	25	25	150	22.5	32	25							
	2020K-16	●		●	20	20	125	24	25	21	0.8	LL-1	LS-1	LT-32	LSP-1	PC-1	FH-2.5
	2525M-16	●		●	25	25	150	24	32	22							
	2525M-22	●		●	25	25	150	29	32	25	0.8	LL-2	LS-2	LT-42	LSP-2	PC-2	LW-3
	3225P -22	●		●	32	25	170	29	32	25							

● Applicable Insert

Toolholder	Insert	
PTGN R/L 12...-11	TNMG	1103..
PTGN R/L ...-11		1104..
PTGN R/L ...-16	TNMM	1604..
PTGN R/L ...-22	TNGG	2204..
PTFN R/L 12...-11	TNMA	1103..
PTFN R/L ...-11	TNGA	1104..
PTFN R/L ...-16		1604..
PTFN R/L ...-22		2204..

TN□□1103-type Insert is applicable for PTGN R/L 1212F-11 & PTFN R/L 1212F-11.

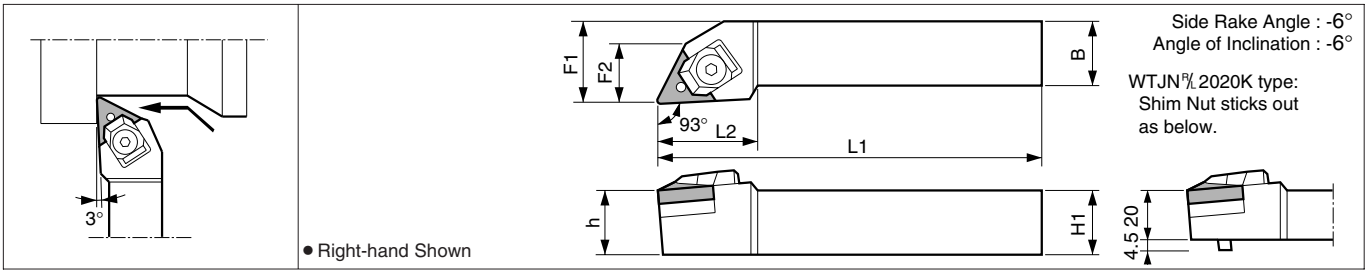
Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Shape	GP	HQ	CQ	TK	GS	HS/CS	GT	Conventional
Size	1104, 16	1104, 16	16, 22	16	1104, 16	16, 22	16	16, 22
Ref. Page	41	41	42	42	42	42	42	42
Application	Finishing	Finishing-Roughing	Medium-Roughing	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel
Shape	R/L-S	R/L-□	R/L-25R	XP(-T)	XQ	XS	GU	SU
Size	1104,16	1103, 1104, 16,22	16	16	16	16	16	16
Ref. Page	44	44	44	43	43	43	43	43
Application	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Shape	R/L-ST	ZS	No Chipbreaker	Ceramic	AH	R/L-A3	Diamond	CBN
Size	16, 22	16	1103, 16 ,22	16, 22	16	16	16	16
Ref. Page	44	43	45	83	43	45	459	443

· PTFN R/L: L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

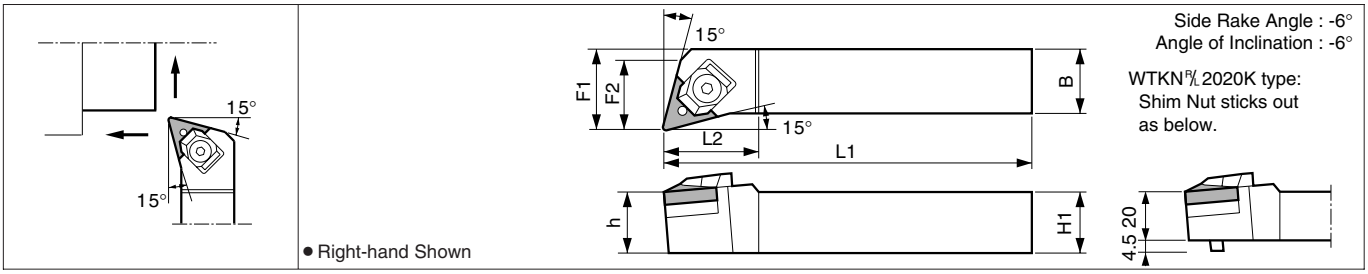
●: Std. Stock ○: Check Availability

Toolholders for General Purpose [TN□□ Insert] — Wedge Lock

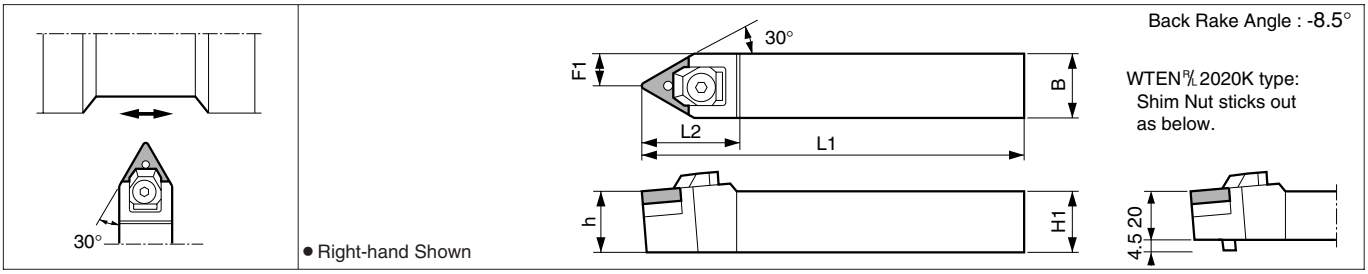
■ WTJN-N (External/Copying, Heavy Duty)



■ WTKN-N (External/Facing/Copying, Heavy Duty)



■ WTEN-N (External/Chamfering, Heavy Duty)



● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts: Clamp Set	Shim	Shim Pin	Shim Nut	Wrench	Spacer
WTJNR/L	2020K-16N	●		●	20	20	125	30	25	23	0.8	WCS-1N	WTN-33	WP-1S	WN-1	LW-3	WSP-1
	2525M-16N	●		●	25	25	150	32	32	24							
WTKNR/L	2020K-16N	●		●	20	20	125	31	25	-	0.8	WCS-1N	WTN-33	WP-1S	WN-1	LW-3	WSP-1
	2525M-16N	●		●	25	25	150	33	32	30							
WTENN	2020K-16N		●		20	20	125	32	10	-	0.8	WCS-1N	WTN-33	WP-1S	WN-1	LW-3	WSP-1
	2525M-16N		●		25	25	150	32	12.5	-							

● Applicable Insert

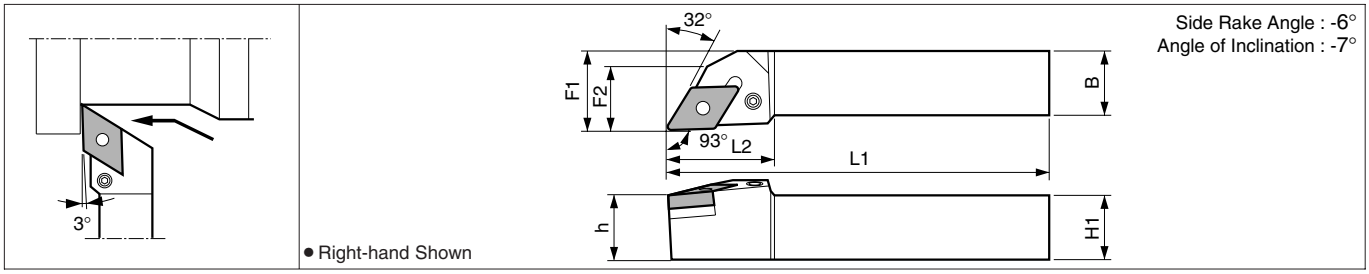
Toolholder	Insert	
WTJNR/L...-16N	TNMG TNMM	1604..
WTKNR/L...-16N	TNGG TNMA	
WTENN...-16N	TNGA	

Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Shape	GP	HQ	CQ	TK	GS	HS/CS	GT	Conventional
Size	16	16	16, 22	16	16	16, 22	16	16
Ref. Page	41	41	42	42	42	42	42	42
Application	Finishing	Finishing-Roughing	Medium-Roughing	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel
Shape	R/L-S	R/L-□	R/L-25R	XP(-T)	XQ	XS	GU	SU
Size	16	16	16	16	16	16	16	16
Ref. Page	44	44	44	43	43	43	43	43
Application	Stainless Steel	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Shape	R/L-ST	ZS	No Chipbreaker	AH	R/L-A3	Diamond	CBN	
Size	16, 22	16	16	16	16	16	16	
Ref. Page	44	43	45	43	45	459	443	

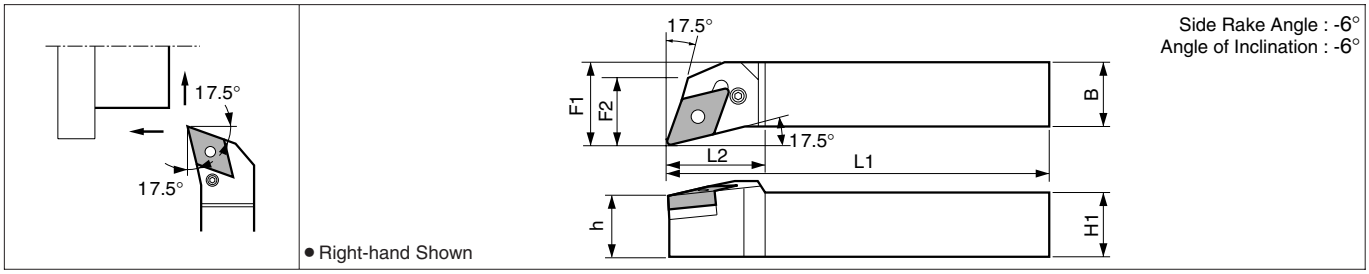
●: Std. Stock ○: Check Availability

Toolholders for General Purpose [DN□□ Insert] Lever Lock

■ PDJN (External/Copying)



■ PDHN (External/Facing/Copying)



● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PDJNR/L	1616H-11	●		●	16	16	100	28	20	-							
	2020K-11	●		●	20	20	125	28	25	-	0.4	LL-1D	LS-1	LD-32	LSP-1	PC-1	FH-2.5
	2525M-11	●		●	25	25	150	28	32	27							
	2020K-15	●		●	20	20	125	36	25	-							
	2525M-15	●		●	25	25	150	36	32	25	0.8	LL-3	LS-2	LD-42	LSP-2	PC-2	LW-3
	3225P-15	●		●	32	25	170	36	32	25							
	2525M-15U	●		●	25	25	150	34	32	24	0.8	LL-4	LS-3	LD-42 (LD-43)	LSP-2	PC-2	LW-3
	3232P-15U	●		●	32	32	170	36	40	28							
PDHNR/L	2020K-15	●		●	20	20	125	34	25	22	0.8	LL-4	LS-3	LD-43 (LD-42)	LSP-2	PC-2	LW-3
	2525M-15	●		●	25	25	150	34	32	24							

● Shim : PDJNR/L-15U ···LD-42 is attached to PDJNR/L-15U. When using DN□□1504 Insert, prepare LD-43 separately.
PDHN ···LD-43 is attached to PDHN. When using DN□□1506 Insert, prepare LD-42 separately.

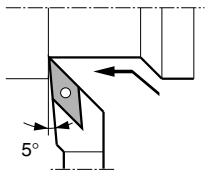
● Applicable Insert

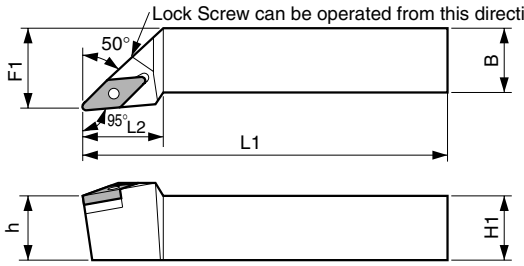
Toolholder	Insert	
PDJNR/L...-11	DNMG	1104..
PDJNR/L...-15	DNMM DNGG	1504..
PDJNR/L...-15U	DNMA	1506.. (1504..)
PDHNR/L...15	DNGA	1504.. (1506..)

Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Shape	GP	HQ	CQ	TK	GS	HS/CS	GT	Conventional
Size	1104,1504,1506	1104,1504,1506	1504,1506	1506	1104,1504,1506	1504,1506	1504,1506	1504,1506
Ref. Page	46	47	47	47	47	47	47	48
Application	Roughing	Finishing	Medium	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel
Shape	HX	R/L-S	R/L	XP(-T)	XQ	XS	GU	SU
Size	1504, 1506	1104	1104,1504	1504, 1506	1504, 1506	1504, 1506	1504, 1506	1504, 1506
Ref. Page	48	49	49	48	48	48	48	48
Application	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Shape	R/L-ST	ZS	No Chipbreaker	Ceramic	AH	R/L-A3	Diamond	CBN
Size	1504, 1506	1504	1504, 1506	1504, 1506	1504, 1506	1504	1504	1504, 1506
Ref. Page	49	48	49	83, 84	49	49	459	443, 444

Toolholders for General Purpose [VN□□ Insert] — Pin Lock

PVLN (External/Copying)

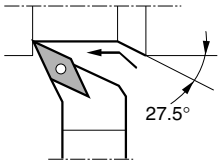


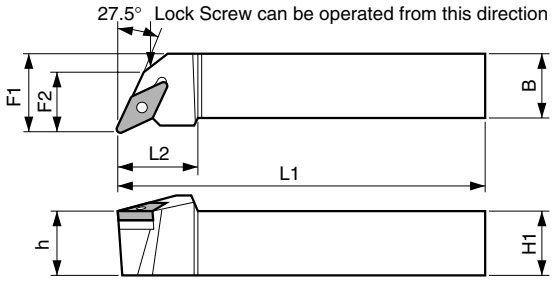


Side Rake Angle : -6°
Angle of Inclination : -9°

● Right-hand Shown

PVPN (External/Facing/Copying/Undercutting)

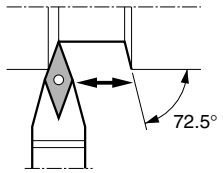


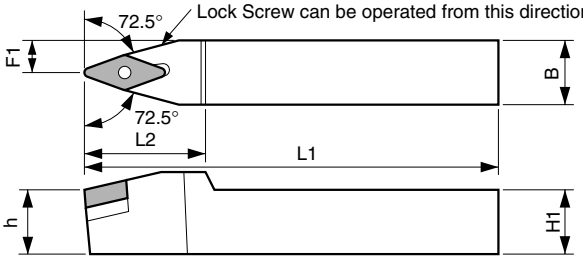


Side Rake Angle : -13°
Angle of Inclination : -10°

● Right-hand Shown

PVVN (External/Copying)





Back Rake Angle : -11°

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts: Lock Pin	Lock Screw	Shim	Wrench
PVLN R/L	2525M-16Q	●		●	25	25	150	37	32	-	0.8	LP-6S	LS-15	KVN-32	LW-3
PVPN R/L	2020K-16Q	●		●	20	20	125	30	25	22	0.8	LP-2S	LS-11	KVN-32	LW-3
	2525M-16Q	●		●	25	25	150	30	32	28		LP-6S			
PVVNN	2020K-16Q		○		20	20	125	35	10	-	0.8	LP-2S	LS-15	KVN-32	LW-3
	2525M-16Q		●		25	25	150	40	12.5	-		LP-6S			

● Applicable Insert

Toolholder	Insert	
PVLN R/L ...-16Q	VNMG VNMM	1604..
PVPN R/L ...-16Q	VNGG VNMA	
PVVNN ...-16Q	VNGA	

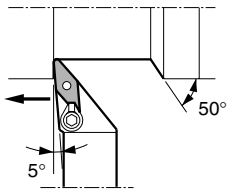
Application	Finishing	Finishing-Medium	Medium	Roughing	Finishing-Medium	Soft Steel	Stainless Steel	Stainless Steel
Shape	GP	HQ	TN-V	Conventional	R/L	XP	GU	SU
Size	16	16	16	16	16	16	16	16
Ref. Page	51	51	51	51	52	51	52	52

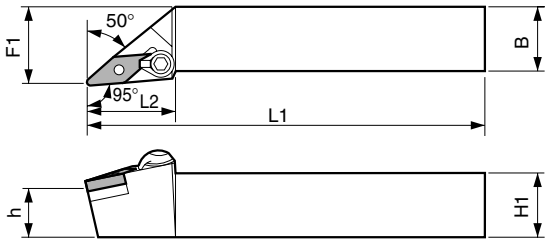
Application	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l				
Shape	No Chipbreaker	Ceramic	Diamond	CBN				
Size	16	16	16	16				
Ref. Page	52	84	459	444				

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [VN□□ Insert] Multi Lock

■ MVLN (External/Copying)

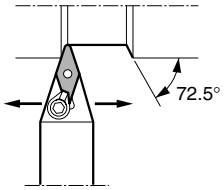


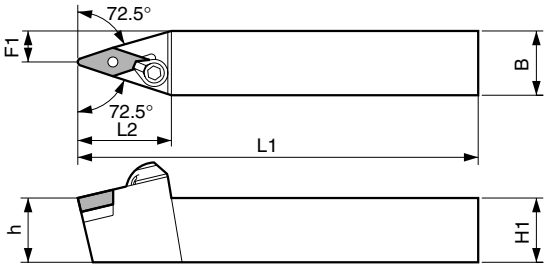


Side Rake Angle : -6°
Angle of Inclination : -9°

● Right-hand Shown

■ MVVN (External/Copying)





Back Rake Angle : -11°

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Lock Pin	Wrench
MVLN[R/L]	2020K-16	●		●	20	20	125	37	25	0.8	CPS-5[R/L]	FH-2.5	MVN-32	TS-3S	FH-2
	2525M-16	●		●	25	25	150	37	32						
MVVNN	2020K-16		●		20	20	125	39	10	0.8	CPS-5R	FH-2.5	MVN-32	TS-3S	FH-2
	2525M-16		●		25	25	150	39	12.5						

● Clamp Set : CPS-5R for R-hand Toolholder, CPS-5L for L-hand Toolholder

● Applicable Insert

Toolholder	Insert	
MVLN[R/L]...-16	VNMG VNMM VNGG VNMA VNGA	1604..
MVVNN...-16		

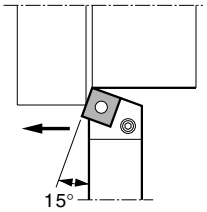
Application	Finishing	Finishing-Medium	Medium	Roughing	Finishing-Medium	Soft Steel	Stainless Steel	Stainless Steel
Shape	GP	HQ	TN-V	Conventional	[R/L]	XP	GU	SU
Size	16	16	16	16	16	16	16	16
Ref. Page	51	51	51	51	52	51	52	52

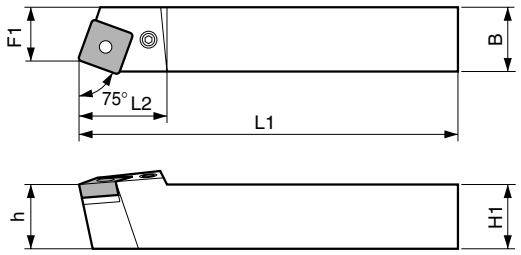
Application	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l				
Shape	No Chipbreaker	Ceramic	Diamond	CBN				
Size	16	16	16	16				
Ref. Page	52	84	459	444				

Turning

Toolholders for General Purpose [SN□□ Insert] Lever Lock

■ PSBN (External)

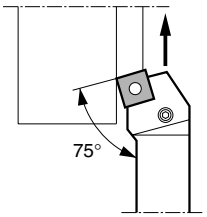


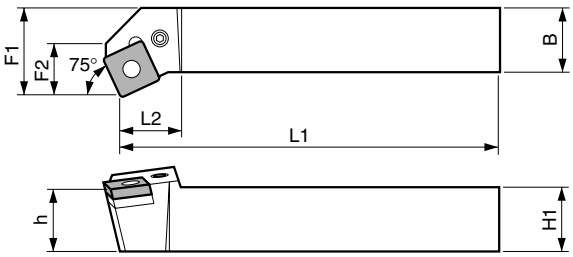


Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

■ PSKN (Facing)





Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PSBN R/L	1616H-09	●		●	16	16	100	21	13	-	0.8	LL-1	LS-1	LS-32	LSP-1	PC-1	FH-2.5
	2020K-12	●		●	20	20	125	21	17	-	0.8	LL-2	LS-2	LS-42	LSP-2	PC-2	LW-3
	2525M-12	●		●	25	25	150	24	22	-							
PSKN R/L	1616H-09	●		●	16	16	100	19	20	12.7	0.8	LL-1	LS-1	LS-32	LSP-1	PC-1	FH-2.5
	2020K-12	●		●	20	20	125	22.5	25	17	0.8	LL-2	LS-2	LS-42	LSP-2	PC-2	LW-3
	2525M-12	●		●	25	25	150	22.5	32	19							

● Applicable Insert

Toolholder	Insert	
PSBN R/L...-09	SNMG	0903..
PSBN R/L...-12	SNGG	1204..
PSKN R/L...-09	SNMA	0903..
PSKN R/L...-12	SNGA	1204..

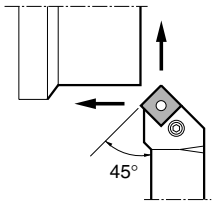
Application	Finishing	Finishing-Medium	Medium-Roughing	Medium-Roughing	Roughing	Finishing-Medium	Finishing-Roughing	Medium-Roughing
Shape	DP	HQ	HS	HT	Conventional	R/L-Y	R/L-□	R/L-25R
Size	12	12	12	12	09, 12	12	12	12
Ref. Page	53	53	53	53	54	54	54	55
Application	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	High Hard Mat'l
Shape	XP	XQ	XS	ST	ZS	No Chipbreaker	Ceramic	CBN
Size	12	12	12	12	12	09,12	12	12
Ref. Page	54	54	54	55	54	55	84	444, 445

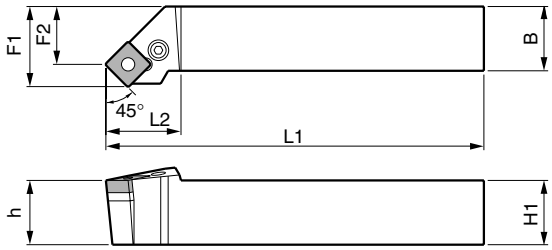
· PSKN R/L : L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [SN□□ Insert] Lever Lock

■ PSSN (External/Facing/Chamfering)

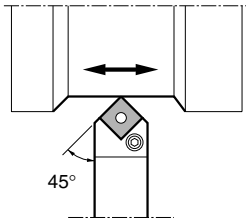


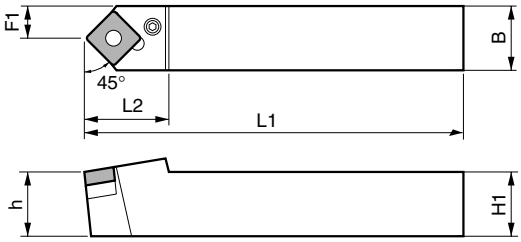


Side Rake Angle : -8°
Angle of Inclination : 0°

● Right-hand Shown

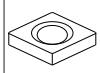
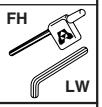
■ PSDN (External/Chamfering)





Back Rake Angle : -8.5°

● Toolholder Dimension

Description		Stock			Dimension (mm)						Std. Corner-R	Spare Parts					
												Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
		R	N	L	H1=h	B	L1	L2	F1	F2							
PSSN R/L	1616H-09	●		●	16	16	100	22	20	13.6	0.8	LL-1	LS-1	LS-32	LSP-1	PC-1	FH-2.5
	2020K-12	●		●	20	20	125	27	25	16.4	0.8	LL-2	LS-2	LS-42	LSP-2	PC-2	LW-3
	2525M-12	●		●	25	25	150	27	32	23.4							
PSDNN	1616H-09		●		16	16	100	21	8	-	0.8	LL-1	LS-1	LS-32	LSP-1	PC-1	FH-2.5
	2020K-12		●		20	20	125	30	10	-	0.8	LL-2	LS-2	LS-42	LSP-2	PC-2	LW-3
	2525M-12		●		25	25	150	30	12.5	-							

● Applicable Insert

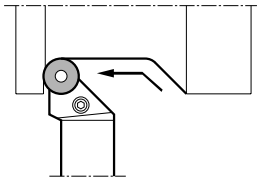
Toolholder	Insert	
PSSN R/L...-09	SNMG	0903..
PSSN R/L...-12	SNGG	1204..
PSDNN...-09	SNMA	0903..
PSDNN...-12	SNGA	1204..

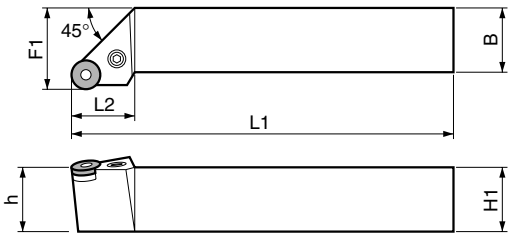
Application	Finishing	Finishing-Medium	Medium-Roughing	Medium-Roughing	Roughing	Finishing-Medium	Finishing-Roughing	Medium-Roughing
Shape	DP	HQ	HS	HT	Conventional	R/L-Y	R/L-□	R/L-25R
Size	12	12	12	12	09, 12	12	12	12
Ref. Page	53	53	53	53	54	54	54	55
Application	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	High Hard Mat'l
Shape	XP	XQ	XS	ST	ZS	No Chipbreaker	Ceramic	CBN
Size	12	12	12	12	12	09,12	12	12
Ref. Page	54	54	54	55	54	55	84	444, 445

· PSSN R/L: At External Turning, R-hand Insert for R-hand Toolholder and L-hand Insert for L-hand Toolholder
At Facing, L-hand Insert for R-hand Toolholder and R-hand Insert for L-hand Toolholder

Toolholders for General Purpose [RN□□ Insert] Lever Lock

■ PRGN (External/Facing/Copying)





Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

● Toolholder Dimension

Description		Stock			Dimension (mm)					Std. Corner-R	Spare Parts					
		R	N	L	H1=h	B	L1	L2	F1		Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PRGN R/L	2020K-09	●		●	20	20	125	19	25	-	LL-1	LS-1	LR-80	LSP-1	PC-1	FH-2.5
	2525M-12	●		●	25	25	150	26	32	-	LL-2	LS-2	LR-81	LSP-2	PC-2	LW-3

● Applicable Insert

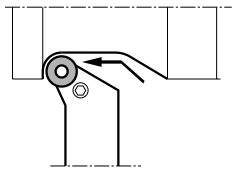
Toolholder	Insert	
PRGN R/L...-09	RNMG	090300
PRGN R/L...-12		120400

Application	Medium-Roughing							
Shape	Conventional 							
Size	09,12							
Ref. Page	56							

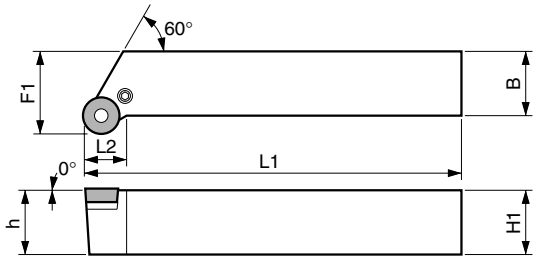
●: Std. Stock ○: Check Availability

Toolholders for General Purpose [RC□□ Insert] Lever Lock

■ PRGC (External/Facing/Copying)

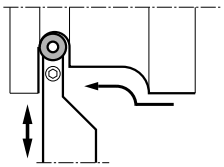


Side Rake Angle : 0°
Angle of Inclination : 0°

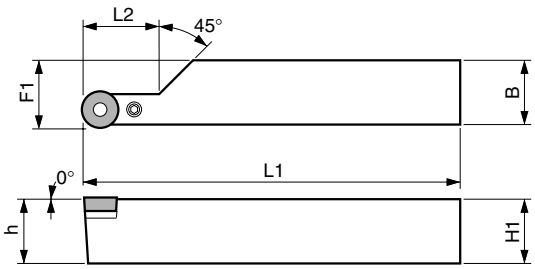


● Right-hand Shown

■ PRXC (External/Facing/Copying)



Side Rake Angle : 0°
Angle of Inclination : 0°



● Right-hand Shown

● Toolholder Dimension

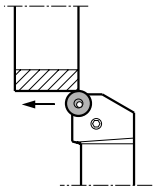
Description		Stock			Dimension (mm)					Std. Corner-R	Spare Parts					
		R	N	L	H1=h	B	L1	L2	F1		Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
PRGC R/L	2020K-10	●		●	20	20	125	15	25	-	LL-05C	LS-05	LR-10C	LSP-1	PC-1	FH-2
	2525M-10	●		●	25	25	150	15	32							
	2020K-12	●		●	20	20	125	14	25	-	LL-1C	LS-1	LR-12C	LSP-1	PC-1	FH-2.5
	2525M-12	●		●	25	25	150	17	32							
PRXC R/L	2020K-10	●		●	20	20	125	25	20.5	-	LL-05C	LS-05	LR-10C	LSP-1	PC-1	FH-2
	2525M-10	○		●	25	25	150	30	25.5							
	2525Q-10	○		○	25	25	180	30	25.5							
	2525M-12	●		●	25	25	150	30	25.7	-	LL-1C	LS-1	LR-12C	LSP-1	PC-1	FH-2.5

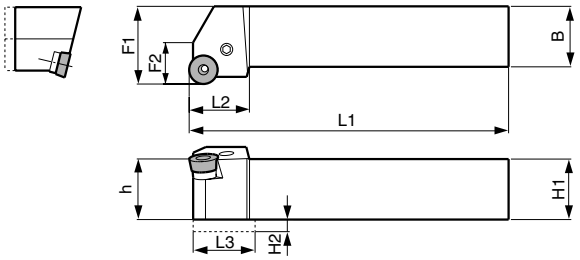
● Applicable Insert

Toolholder	Insert	
PRGC R/L...-10	RCGX	1003M0
PRGC R/L...-12		1204M0
PRXC R/L...-10	RCMX	1003M0
PRXC R/L...-12		1204M0

Application	Medium	Non-ferrous Metal
Shape	Conventional 	AQ 
Size	10,12	10
Ref. Page	56	56

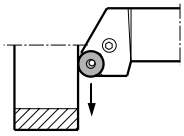
■ PRGC-BE (External)

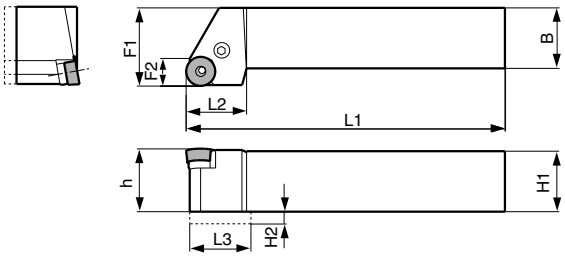




● Right-hand Shown

■ PRGC-BF (Facing)



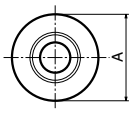
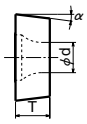


● Right-hand Shown

● Toolholder Dimension

Description		Stock			Dimension (mm)								Spare Parts						Applicable Insert
													Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench	
		R	N	L	H1=h	H2	B	L1	L2	L3	F1	F2							
PRGC R/L	2020K-12BE	○		○	20	-	20	125	22	-	25	15	LL-1C	LS-1	LR-12C	LSP-1	PC-1	FH-2.5	RCMT1204
	2525M-12BE	○		○	25	-	25	150	25	-	32	17							
	2020K-16BE	○		○	20	5	20	125	27	25.6	29	21	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5	RCMT1606
	2525M-16BE	○		○	25	-	25	150	27	-	32	22							
PRGC R/L	2020K-12BF	○		○	20	-	20	125	22	-	25	10	LL-1C	LS-1	LR-12C	LSP-1	PC-1	FH-2.5	RCMT1204
	2525M-12BF	○		○	25	-	25	150	25	-	32	11							
	2020K-16BF	○		○	20	5	20	125	27	25.3	25	17	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5	RCMT1606
	2525M-16BF	○		○	25	-	25	150	27	-	32	17							

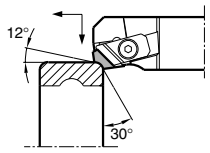
● Applicable Insert

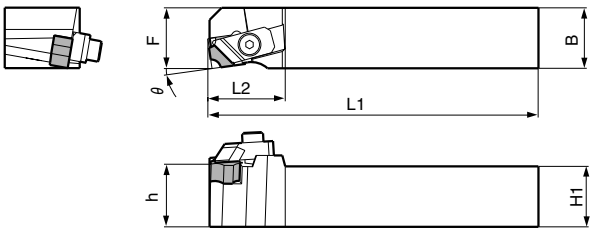
Shape			Description	Dimension (mm)				Angle (°)	Insert Grade					
									Cermet					
				A	T	ϕd	R	α	TN6020	TN30	TN60	TN90	TC30	TC40
			RCMT 1204M0-BB 1606M0-BB	12.0 16.0	4.76 6.35	4.4 5.5	- -	7°				● ●		

●: Std. Stock ○: Check Availability

Toolholders for Bearing Machining [SNMF Insert] Top Clamp

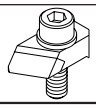
CBSN (External Round Chamfering)





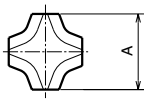
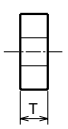
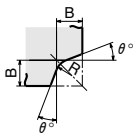
● Right-hand Shown

● Toolholder Dimension

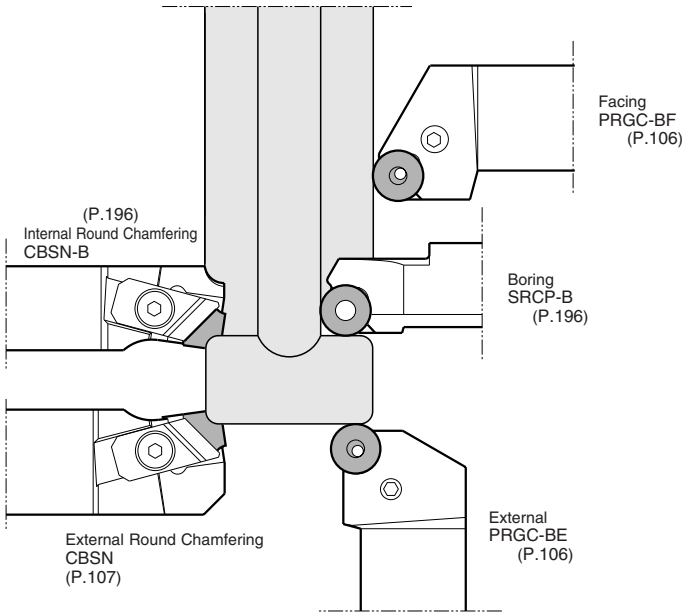
Description	Stock			Dimension (mm)					θ	Spare Parts					
	R	N	L	H1=h	B	L1	L2	F1		Clamp Set	Wrench	Shim	Shim Screw		
															
CBSNR/L 2020K-12	●		●	20	20	125	30	20	9°	CP-RCR/L	LW-5	SP-RC	SP3X8		
2525M-12	●		●	25	25	150	30	25							

● Clamp Set : CP-RCR for R-hand Toolholder, CP-RCL for L-hand Toolholder

● Applicable Insert

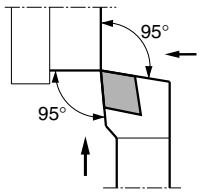
Shape				Description	Dimension (mm)				Angle (°)	Insert Grade					
					A	T	B	R	θ	Cermet					
										TN6020	TN30	TN60	TN90	TC30	TC40
				SNMF 120406-21	12.70	4.76	1.5	0.6	21°				●		
				120410-21			3.0	1.0					●		
				120416-21			3.1	1.6					●		
				120421-21			3.2	2.1					●		
				120426-21			3.3	2.6					●		

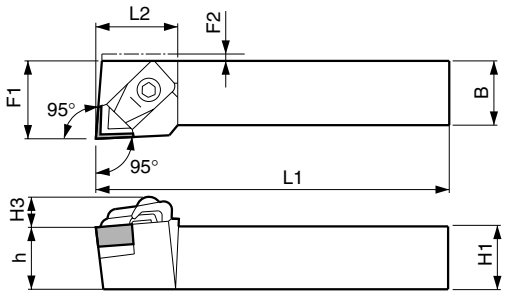
◆ Tooling for Bearing Machining



Toolholders for Ceramic Tools [CN□□ Insert] Top Clamp

■ CCLN (External/Facing)





Side Rake Angle : -6°
Angle of Inclination : -6°

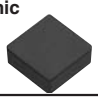
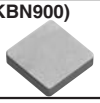
● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts: Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
CCLN R/L	2020K-12	●		○	20	14	20	125	32	27	5	0.8	CB-16	CE-010	LW-4	SP-441 (SP-443)	M3X8 (M3X12)
	2525M-12	●		●	25	14	25	150	32	32	-						
	2525M-16	○		○	25	14	25	150	35	32	-	0.8	CB-17	CE-220	LW-4	SP-454	M4X10
	3225P-16	●		●	32	14	25	170	35	32	-						

● Shim & Shim Screw : When using CN□□1204 Insert, Prepare Spare Parts in ( ) separately

● Applicable Insert

Application	Cast Iron / High Hard Mat'l	Cast Iron / High Hard Mat'l
Ref. Page	82	442
Shape / Toolholder	Ceramic 	CBN(KBN900) 
CCLN R/L ...-12	CNGN1207..(1204..) CNMN1207	(CNMN1204)
CCLN R/L ...-16	CNGN1607..	-

◆Selection of Ceramic Insert

Select the suitable Ceramic Insert and specification (Corner-R, Feed Rate, Chamfer, etc.) from the table below.

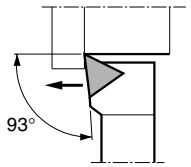
(FC250, Cutting Edge Angle: 0°-15°)

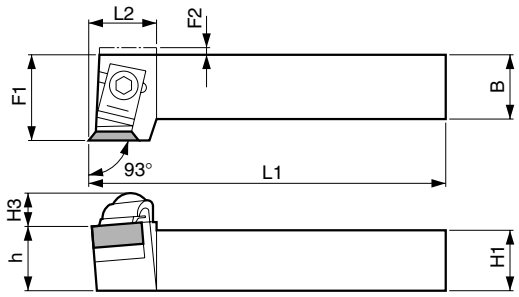
Insert Shape	Corner-R	f (mm/rev) 0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	ap d (mm)
RN	-											0.3~4
SN	2.0											0.3~4
	1.6											
EN	1.2											
CN	0.8											
	0.4											
TN	1.6						For Finishing					0.3~2
DN	1.2											
	0.8											
Chamfer		0.05mm×20°		(0.1~0.2)mm×(20°~25°)				0.3mm×30°				-
Insert Thickness		7.94mm										

●: Std. Stock ○: Check Availability

Toolholders for Ceramic Tools [TN□□ Insert] Top Clamp

■ CTJN (External)

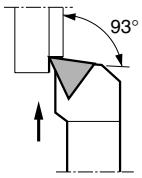


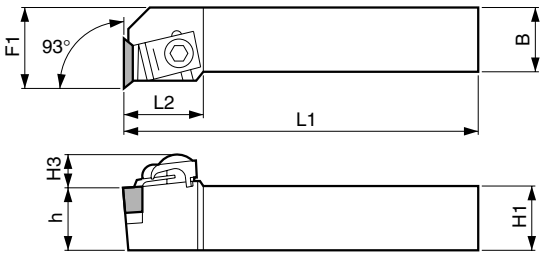


Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

■ CTUN (Facing)





Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

● Toolholder Dimension

Description		Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
		R	N	L	H1=h	H3	B	L1	L2	F1	F2		Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
CTJNR/L	2020K-16	○		○	20	11	20	125	21	25	2	0.8	CB-12/13	CE-020	LW-4	SP-221 (SP-223)	M3X8 (M3X12)
	2525M-16	●		○	25	11	25	150	21	32	-						
CTUNR/L	2020K-16	○		○	20	11	20	125	27	25	-	0.8	CB-13/12	CE-020	LW-4	SP-221 (SP-223)	M3X8 (M3X12)
	2525M-16	○		○	25	11	25	150	27	32	-						

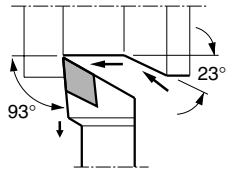
● CTJN(Chipbreaker) : CB12 for R-hand Toolholder, CB13 for L-hand Toolholder
CTUN(Chipbreaker) : CB13 for R-hand Toolholder, CB12 for L-hand Toolholder
● Shim & Shim Screw : When using TN□□1604 Insert, Prepare Spare Parts in ( ) separately

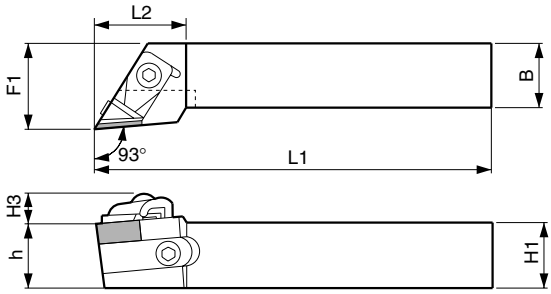
● Applicable Insert

Application	Cast Iron / High Hard Mat'l	Cast Iron / High Hard Mat'l	Cast Iron
Ref. Page	83	443	45
Shape / Toolholder	**Ceramic**	**CBN(KBN900)**	**Coated/Cermet**
CTJNR/L...-16	TNGN1607..(1604..) (TNMN1604..)	(TNMN1604..)	(TNGN1604..) (TNMN1604..)
CTUNR/L...-16	TNGN1607..(1604..) (TNMN1604..)	(TNMN1604..)	(TNGN1604..) (TNMN1604..)

Toolholders for Ceramic Tools [DN□□ Insert] — Top Clamp

■ CDJN (External/Copying)





Side Rake Angle : -5°
Angle of Inclination : -8°

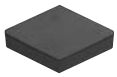
● Right-hand Shown

● Toolholder Dimension

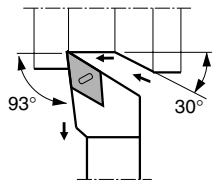
Description	Stock			Dimension (mm)						Std. Corner-R	Spare Parts				
	R	N	L	H1=h	H3	B	L1	L2	F1		Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
CDJNR/L 2525M-15	●		○	25	16	25	150	32	32	0.8	CB-14/15	CE-010	LW-4	556CR/L	HH5X16
CDJNR/L 3225P-15	●		●	32	16	25	170	32	32						

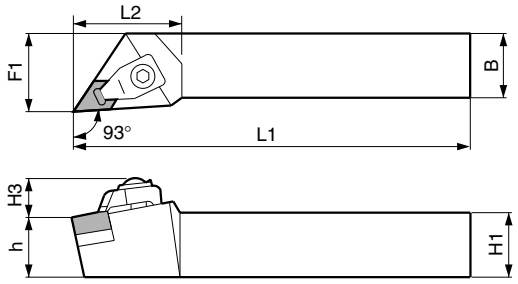
● Chipbreaker : CB-14 for R-hand Toolholder, CB-15 for L-hand Toolholder
● Shim : 556CR for R-hand Toolholder, 556CL for L-hand Toolholder

● Applicable Insert

Application	Cast Iron / High Hard Mat'l
Ref. Page	84
Shape / Toolholder	Ceramic 
CDJNR/L...-15	DNGN1507..

■ CDJN-X (External/Copying)





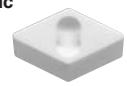
Side Rake Angle : -5°
Angle of Inclination : -8°

● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)						Std. Corner-R	Spare Parts			
	R	N	L	H1=h	H3	B	L1	L2	F1		Clamp Set	Wrench	Shim	Shim Screw
CDJNR/L 2525M-12X	○		○	25	16	25	150	32	32	0.8	CE-050	LW-4	SP-521	M3X8

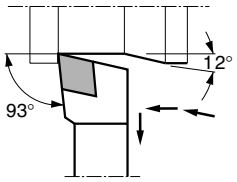
● Applicable Insert

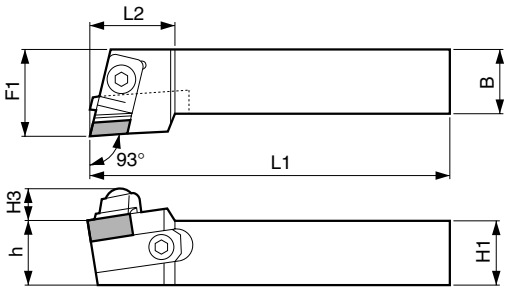
Application	Cast Iron
Ref. Page	84
Shape / Toolholder	Ceramic 
CDJNR/L...-12X	DNMX1207..

●: Std. Stock ○: Check Availability

Toolholders for Ceramic Tools [EN□□ Insert] Top Clamp

■ CEJN (External/Copying)

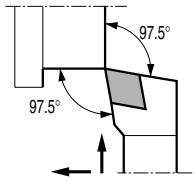


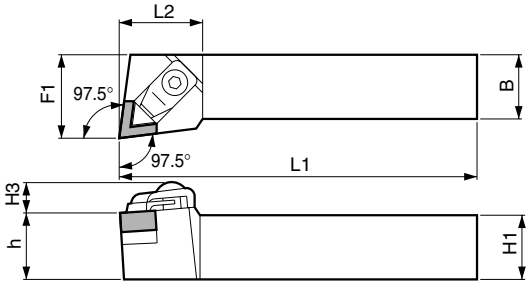


Side Rake Angle : -5°
Angle of Inclination : -8°

● Right-hand Shown

■ CELN (External/Facing)

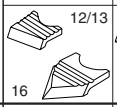
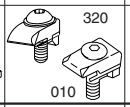
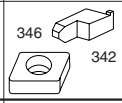




Side Rake Angle : -6°
Angle of Inclination : -6°

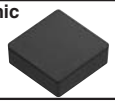
● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
												Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
	R	N	L	H1=h	H3	B	L1	L2	F1							
CEJN R/L 2525M-13	●			25	16	25	150	30	32		0.8	**CB-12/13**	**CE-320**	**LW-4**	**346C R/L**	**HH5X16**
CELN R/L 2525M-13	●		○	25	15	25	150	32	32		0.8	**CB-16**	**CE-010**	**LW-4**	**SP-342**	**M3X8**

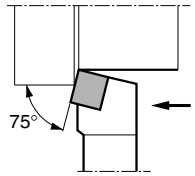
● CEJN(Chipbreaker) : CB-12 for R-hand Toolholder, CB-13 for L-hand Toolholder
● CEJN (Shim) : 346CR for R-hand Toolholder, 346CL for L-hand Toolholder

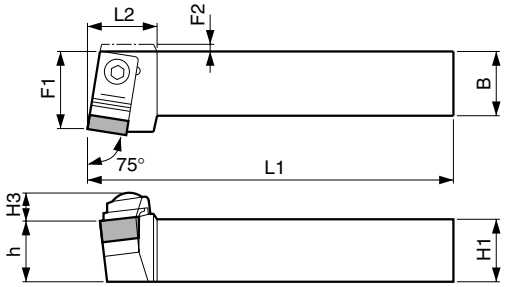
● Applicable Insert

Application	Cast Iron / High Hard Mat'l
Ref. Page	84
Shape / Toolholder	**Ceramic** 
CEJN R/L ...-13	ENGN1307..
CELN R/L ...-13	ENGN1307..

Toolholders for Ceramic Tools [SN□□ Insert] Top Clamp

CSRN (External)

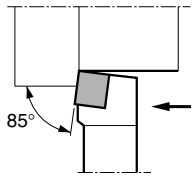


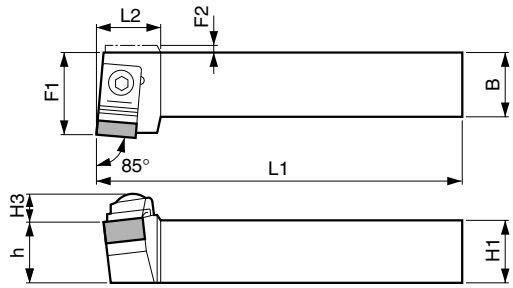


Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

CS-N (External)

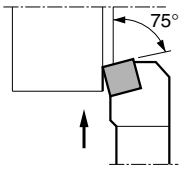


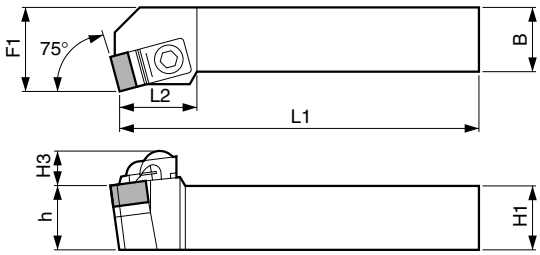


Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

CSKN (Facing)

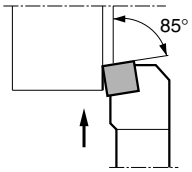


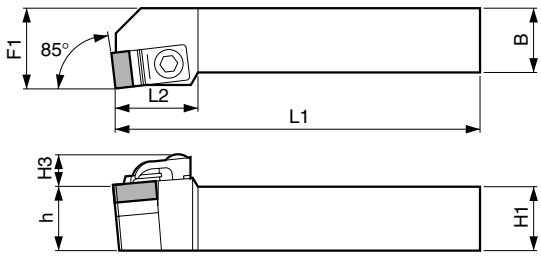


Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

CSYN (Facing)

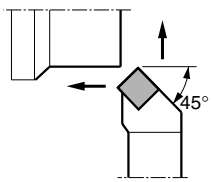


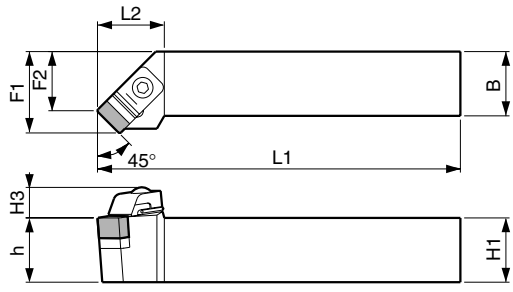


Side Rake Angle : -6°
Angle of Inclination : -4°

● Right-hand Shown

CSSN (External/Facing/Chamfering)



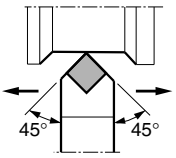


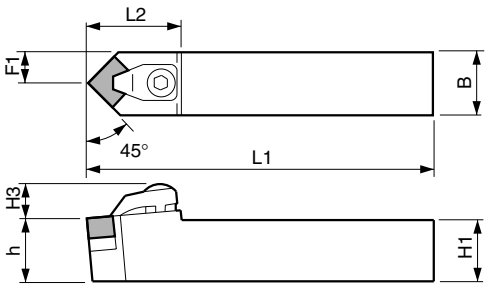
Side Rake Angle : -6°
Angle of Inclination : 0°

● Right-hand Shown

Toolholders for Ceramic Tools [SN□□ Insert] Top Clamp

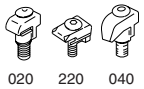
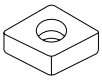
■ CSDN (External/Chamfering)





Back Rake Angle : -8.5°

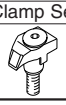
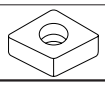
● Toolholder Dimension

Description		Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
													Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
		R	N	L	H1=h	H3	B	L1	L2	F1	F2			 020 220 040			
CSRN R/L	2020K-12	○		○	20	11	20	125	22	22	2	0.8	CB-11	CE-020	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12	●		●	25	11	25	150	22	27	-						
	3225P-12	●		●	32	11	25	170	22	27	-						
	3225P-15	○			32	15	25	170	30	32	-	0.8	CB-51	CE-220	LW-4	SP-162	M4X10
	4040R-15	○		○	40	15	40	200	30	43	-						
CS-N R/L	2020K-12	○		○	20	11	20	125	20	25	2	0.8	CB-11	CE-020	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12	●		○	25	11	25	150	20	32	-						
CSKN R/L	2020K-12	○		○	20	11	20	125	27	25	-	0.8	CB-11	CE-020	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12	○		○	25	11	25	150	27	32	-						
	3225P-12	●			32	11	25	170	27	32	-						
	3225P-15	○			32	15	25	170	37	32	-	0.8	CB-51	CE-220	LW-4	SP-162	M4X10
CSYN R/L	2020K-12	○		○	20	11	20	125	27	25	-	0.8	CB-11	CE-020	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12	○		○	25	11	25	150	27	32	-						
CSSN R/L	2020K-12	●		○	20	11	20	125	26	25	16	0.8	CB-11	CE-020	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12	●		●	25	11	25	150	26	32	23						
	3225P-12	●		●	32	11	25	170	26	32	23						
CSDNN	2020K-12		○		20	13	20	125	33	10	-	0.8	-	CE-040	LW-4	SP-141 (SP-143)	M3X8 (M3X12)
	2525M-12		●		25	13	25	150	33	12.5	-						
	3225P-12		○		32	13	25	170	33	12.5	-						

● Shim & Shim Screw : When using SN□□1204 Insert, Prepare Spare Parts in ( ) separately

● Applicable Insert

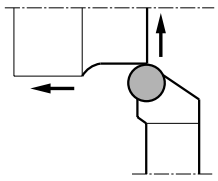
Application	Cast Iron / High Hard Mat'l	Cast Iron
Ref. Page	85	55
Shape / Toolholder	**Ceramic** 	**Coated/Cermet** 
CSRN R/L...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)
CSRN R/L...-15	SNGN1507..	-
CS-N R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)
CSKN R/L...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)
CSKN R/L...-15	SNGN1507..	-
CSYN R/L...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)
CSSN R/L...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)
CSDNN ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)

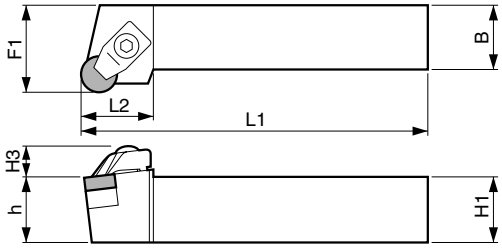
Cast Iron / High Hard Mat'l	When using as Toolholder for Solid CBN Tools (KBN900), Prepare Spare Parts below separately.		
445	Clamp Set	Shim	Shim Screw
CBN(KBN900) 			
(SNMN1204..)	**CE-030A**	**SP-143**	**M3X12**
-	-		
(SNMN1204..)	**CE-030A**	**SP-143**	**M3X12**
(SNMN1204..)	**CE-030A**	**SP-143**	**M3X12**
-	-		
(SNMN1204..)	**CE-030A**	**SP-143**	**M3X12**
(SNMN1204..)	**CE-030A**	**SP-143**	**M3X12**
(SNMN1204..)	-	**SP-143**	**M3X12**

● CSDNN...-12 type : Use the originally attached clamp set CE-040.

Toolholders for Ceramic Tools [RN□□ Insert] Top Clamp

■ CRSN (External/Facing)

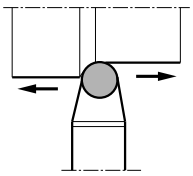


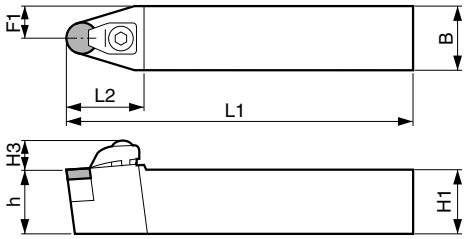


Side Rake Angle : -6°
Angle of Inclination : -6°

● Right-hand Shown

■ CRDN (External/Copying)





Back Rake Angle : -8.5°

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Shim Screw
CRSN R/L	2020K-12	○		○	20	11	20	125	26	25					
	2525M-12	●		●	25	11	25	150	26	32	-	CE-030	LW-4	SP-841 (SP-843)	M3X8 (M3X12)
	3225P-12	●		●	32	11	25	170	26	32					
	4040R-15	●		●	40	11	40	200	33	45	-	CE-040	LW-4	SP-861	M4X10
CRDNN	2020K-12		○		20	11	20	125	29	10					
	2525M-12		●		25	11	25	150	29	12.5	-	CE-030	LW-4	SP-841 (SP-843)	M3X8 (M3X12)
	3225P-12		●		32	11	25	170	29	12.5					
	3232P-15		○		32	11	32	170	36	17.5					
	4040R-15		○		40	11	40	200	36	20	-	CE-040	LW-4	SP-861	M4X10

● Shim & Shim Screw : When using RN□□1204 Insert, Prepare spare parts in ( ) separately

● Applicable Insert

Application / Shape / Toolholder	Cast Iron / High Hard Mat'l — Ref. Page 86 — Ceramic	Cast Iron / High Hard Mat'l — 445 — CBN(KBN900)	When using as Toolholder for Solid CBN Tools (KBN900), Prepare Spare Parts below separately. Clamp Set	Shim	Shim Screw
CRSN R/L...-12	RNGN120700(RNGN120400)	(RNMN120400)	CE-030A	SP-843	M3X12
CRSN R/L...-15	RNGN150700	-	-		
CRDNN ...-12	RNGN120700(RNGN120400)	(RNMN120400)	CE-030A	SP-843	M3X12
CRDNN ...-15	RNGN150700	-	-		

●: Std. Stock ○: Check Availability

Recommended Cutting Conditions

■ Recommended Cutting Conditions - External Turning (Negative Insert)

ISO Classification	Work Material (Hardness)	Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner -R	Lower Limit - Recommendation - Upper Limit		
							V_C (m/min)	a_p (mm)	f (mm/rev)
P	Low-carbon Steel Low-carbon Alloy S10C,SCM415 SS400,SCr415 STKM,SP etc.	Finishing (Gloss Oriented)	Continuous	XP	TN6020	0.4	250 - 300 - 350	0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2
			Interrupted	XP-T	TN6020	0.4	200 - 250 - 300	0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2
		Finishing (Life Oriented)	Continuous	XP	PV90	0.4	250 - 300 - 350	0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2
			Interrupted	XP-T	PV90	0.4	200 - 250 - 300	0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2
		Finishing-Medium (Gloss Oriented)	Continuous	XQ	TN6020	0.4	250 - 300 - 350	0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3
			Interrupted		TN6020	0.8	150 - 200 - 250	0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3
		Finishing-Medium (Life Oriented)	Continuous	XQ	PV90	0.8	250 - 300 - 350	0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3
			Interrupted		CA5025	0.8	150 - 200 - 250	0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3
		Medium-Roughing	Continuous	XS	PV90	0.8	200 - 250 - 300	0.8 - 1.5 - 2.0	0.25 - 0.3 - 0.4
			Interrupted		CA5025	0.8	150 - 200 - 250	0.8 - 1.5 - 2.0	0.25 - 0.3 - 0.4
		Roughing	Continuous	CS	CA5025	0.8	180 - 200 - 250	1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4
			Interrupted		CA5025	1.2	100 - 150 - 180	1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4
		Medium-Roughing (High Feed)	Continuous	GT	CA5025	0.8	150 - 180 - 200	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
			Interrupted		CA5025	1.2	100 - 120 - 150	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
	Medium-carbon Steel Medium-carbon Alloy S45C SCM435 etc.	Finishing (Gloss Oriented)	Continuous	GP	TN6020	0.4	200 - 250 - 300	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Interrupted		TN6020	0.8	100 - 150 - 200	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
		Finishing (Life Oriented)	Continuous	GP	PV7020	0.4	200 - 250 - 300	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Interrupted		PV90	0.8	100 - 150 - 200	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
		Finishing-Medium (Gloss Oriented)	Continuous	CQ	TN6020	0.8	150 - 200 - 250	0.5 - 1.5 - 2.5	0.1 - 0.2 - 0.25
			Interrupted		TN6020	1.2	100 - 150 - 200	0.5 - 1.5 - 2.5	0.1 - 0.15 - 0.2
		Finishing-Medium (Life Oriented)	Continuous	CQ	PV7020	0.8	150 - 200 - 250	0.5 - 1.5 - 2.5	0.1 - 0.2 - 0.25
			Interrupted		CA5025	0.8	100 - 150 - 200	0.5 - 1.5 - 2.5	0.1 - 0.15 - 0.2
		Medium-Roughing	Continuous	GS	CA5025	0.8	120 - 180 - 220	1.0 - 2.0 - 3.0	0.15 - 0.2 - 0.3
			Interrupted		CA5025	1.2	100 - 120 - 150	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.5
		Roughing	Continuous	CS	CA5025	0.8	120 - 180 - 220	1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4
			Interrupted		CA5025	1.2	100 - 120 - 150	1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4
		Medium-Roughing (High Feed)	Continuous	GT	CA5025	0.8	100 - 150 - 180	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
			Interrupted		CA5025	1.2	100 - 120 - 150	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
	High-carbon Alloy SKD11 SKD61 etc.	Finishing (Gloss Oriented)	Continuous	GP	TN6020	0.4	100 - 150 - 200	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Interrupted		TN6020	0.8	80 - 120 - 150	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
		Finishing (Life Oriented)	Continuous	GP	PV7020	0.4	100 - 150 - 200	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Interrupted		PV90	0.8	80 - 120 - 150	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.2
		Finishing-Medium	Continuous	CQ	CR7015	0.8	100 - 150 - 180	0.5 - 1.5 - 2.5	0.15 - 0.25 - 0.3
			Interrupted		CA5025	0.8	80 - 100 - 120	0.5 - 1.5 - 2.5	0.15 - 0.2 - 0.25
		Medium-Roughing	Continuous	GS	CR7015	0.8	100 - 120 - 150	1.0 - 2.0 - 3.0	0.15 - 0.2 - 0.3
			Interrupted		CA5025	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.5
		Medium-Roughing (High Feed)	Continuous	GT	CR7015	0.8	100 - 120 - 150	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
			Interrupted		CA5025	1.2	80 - 100 - 120	1.5 - 3.0 - 4.5	0.25 - 0.35 - 0.45
M	Stainless Steel SUS303,SUS304 SUS316,SUS420J2 etc.	Finishing (Gloss Oriented)	Continuous	HQ	TN6020	0.8	120 - 150 - 180	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
			Interrupted		TN6020	0.8	80 - 100 - 120	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
		Finishing	Continuous	GU	CA6015	0.4	120 - 150 - 200	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
			Interrupted		CA6015	0.8	100 - 120 - 150	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
		Medium-Roughing	Continuous	SU	CA6015	0.4	120 - 150 - 200	1.0 - 2.0 - 3.0	0.1 - 0.2 - 0.3
			Interrupted		CA6015	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.4
		Roughing	Continuous	Conventional Molded	CA6015	0.8	100 - 120 - 150	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
			Interrupted		CA6015	1.2	80 - 100 - 120	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
	Stainless Steel SUS630 etc.	Finishing (Gloss Oriented)	Continuous	HQ	TN6020	0.8	100 - 120 - 150	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
			Interrupted		TN6020	0.8	80 - 100 - 120	0.5 - 1.0 - 1.5	0.05 - 0.08 - 0.1
		Finishing	Continuous	GU	CA6015	0.4	100 - 120 - 150	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
			Interrupted		CA6015	0.8	80 - 100 - 120	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
		Medium-Roughing	Continuous	SU	CA6015	0.4	100 - 120 - 150	1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.25
			Interrupted		CA6015	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.1 - 0.15 - 0.2
		Roughing	Continuous	Conventional Molded	CA6015	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.4
			Interrupted		CA6015	1.2	60 - 80 - 100	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
K	Gray Cast Iron FC200 FC250 FC300 etc.	Finishing (High Speed)	Continuous	Without Chipbreaker	KBN65B	0.8	400 - 700 - 900	0.05 - 0.2 - 0.5	0.03 - 0.05 - 0.1
			Continuous		KBN900	1.2	500 - 900 - 1200	0.1 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Interrupted		KBN900	1.2	500 - 700 - 900	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2
		Finishing (Gloss Oriented)	Continuous	Conventional Molded	TN30	0.8	150 - 200 - 250	0.5 - 1.0 - 1.5	0.1 - 0.2 - 0.3
			Interrupted		TN6020	0.8	100 - 150 - 200	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
		Finishing (Ceramic)	Continuous	Without Chipbreaker	KA30	1.2	300 - 500 - 700	0.3 - 0.5 - 1.0	0.1 - 0.2 - 0.3
			Continuous		A66N	0.8	300 - 450 - 600	0.3 - 0.5 - 1.0	0.1 - 0.2 - 0.3
		Medium (Ceramic)	Continuous		KS6000	1.2	250 - 400 - 500	1.0 - 2.0 - 3.0	0.15 - 0.25 - 0.35
			Interrupted		KS6000	1.2	250 - 400 - 500	1.0 - 2.0 - 3.0	0.15 - 0.2 - 0.3
		Medium	Continuous	Conventional Molded	CR7015	0.8	150 - 200 - 250	0.5 - 2.0 - 2.5	0.1 - 0.2 - 0.3
			Interrupted		CR7015	1.2	100 - 150 - 200	0.5 - 2.0 - 2.5	0.08 - 0.15 - 0.2
		Roughing	Continuous	ZS	CA4010	0.8	150 - 200 - 250	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
			Interrupted		CA4010	1.2	100 - 150 - 200	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4

Recommended Cutting Conditions

■ Recommended Cutting Conditions - External Turning (Negative Insert)

ISO Classfication	Work Material (Hardness)		Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner -R	Lower Limit - Recommendation - Upper Limit		
								V_C (m/min)	a_p (mm)	f (mm/rev)
K	**Ductile Cast Iron** FCD450 FCD600 etc.		Finishing (High Speed)	Continuous	**Without Chipbreaker**	**KBN10B**	0.4	200 - 300 - 400	0.1 - 0.3 - 0.5	0.1 - 0.15 - 0.2
				Continuous		**A66N**	0.8	200 - 250 - 350	0.1 - 0.5 - 1.0	0.1 - 0.2 - 0.4
			Finishing (Gloss Oriented)	Continuous	**Conventional Molded**	**TN30**	0.8	150 - 180 - 200	0.5 - 1.0 - 1.5	0.1 - 0.2 - 0.3
				Interrupted		**TN6020**	0.8	100 - 150 - 180	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
			Medium	Continuous	**Conventional Molded**	**CR7015**	0.8	100 - 150 - 200	0.5 - 2.0 - 2.5	0.1 - 0.2 - 0.3
				Interrupted		**CR7015**	1.2	100 - 150 - 180	0.5 - 2.0 - 2.5	0.08 - 0.15 - 0.2
			Roughing	Continuous	**GC**	**CR7015**	0.8	100 - 150 - 200	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
				Interrupted		**CR7015**	1.2	100 - 150 - 180	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4
N	**Non-ferrous Metal Copper Alloy Aluminum Alloy** (Si: under 10%) etc.		Finishing (High Speed) (Rainbow-colored Gloss)	Continuous	**Without Chipbreaker**	**KPD010**	0.4	300 - 800 - 2000	0.05 - 0.5 - 1.0	0.05 - 0.1 - 0.15
			Finishing	Continuous	**A3**	**KW10**	0.8	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25
				Interrupted		**KW10**	0.8	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25
			Medium	Continuous	**AH**	**KW10**	0.8	200 - 300 - 500	1.0 - 2.0 - 3.5	0.1 - 0.3 - 0.4
				Interrupted		**KW10**	0.8	200 - 300 - 500	1.0 - 2.0 - 3.5	0.1 - 0.3 - 0.4
S	**Titanium Alloy** Ti-6Al-4V etc.		Finishing (Precision) (Rainbow-colored Gloss)	Continuous	**Without Chipbreaker**	**KPD010**	0.4	100 - 120 - 150	0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15
				Interrupted		**KPD010**	0.4	70 - 100 - 120	0.05 - 0.3 - 0.5	0.03 - 0.07 - 0.1
			Finishing	Continuous	**A3**	**KW10**	0.4	10 - 30 - 50	0.5 - 1.5 - 2.5	0.07 - 0.15 - 0.25
				Interrupted		**KW10**	0.4	10 - 30 - 50	0.5 - 1.5 - 2.5	0.07 - 0.15 - 0.2
			Medium	Continuous	**AH**	**KW10**	0.8	10 - 30 - 50	1.0 - 2.0 - 3.5	0.1 - 0.25 - 0.35
				Interrupted		**KW10**	0.8	10 - 30 - 50	1.0 - 2.0 - 3.5	0.1 - 0.2 - 0.3
	High-temperature Alloy inconel 625 inconel 718 etc.		Finishing	Continuous	**GU**	**CA6015**	0.4	40 - 60 - 80	0.2 - 0.5 - 1.0	0.03 - 0.08 - 0.12
				Interrupted	Conventional Molded	**CA6015**	0.8	40 - 60 - 80	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.15
			Medium	Continuous	**SU**	**CA6015**	0.8	40 - 60 - 80	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.15
				Interrupted	Conventional Molded	**CA6015**	1.2	40 - 60 - 80	0.5 - 1.0 - 2.0	0.1 - 0.15 - 0.2
H	**Heat Treated Steel High Hard Mat'l** SKD11 SKD61 etc.	40~50 HRC	Finishing	Continuous	**HQ**	**CR7015**	0.8	60 - 100 - 120	0.1 - 0.3 - 0.5	0.05 - 0.08 - 0.1
				Interrupted	Without Chipbreaker	**CR7015**	0.8	30 - 50 - 70	0.1 - 0.3 - 0.5	0.05 - 0.08 - 0.1
		40~50 HRC 50~65 HRC	Finishing	Continuous	**Without Chipbreaker**	**A66N**	0.8	60 - 80 - 100	0.2 - 0.5 - 0.7	0.05 - 0.1 - 0.15
				Continuous		**A66N**	1.2	30 - 40 - 60	0.2 - 0.5 - 0.7	0.05 - 0.1 - 0.15
		50~68 HRC	Finishing	Continuous	Without Chipbreaker	**KBN10B**	0.8	80 - 120 - 150	0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1
				Interrupted	**SE-T,ME-T**	**KBN25B**	1.2	60 - 100 - 120	0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1
			Medium	Continuous	**Without Chipbreaker**	**KBN900**	1.2	80 - 100 - 120	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.2
				Interrupted		**KBN900**	Round	70 - 90 - 110	0.3 - 0.7 - 1.0	0.05 - 0.1 - 0.15

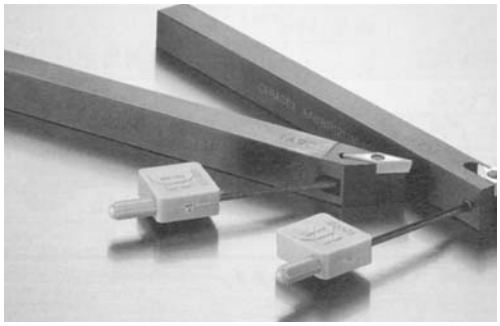
Small Tools

117～146

Product Lineup

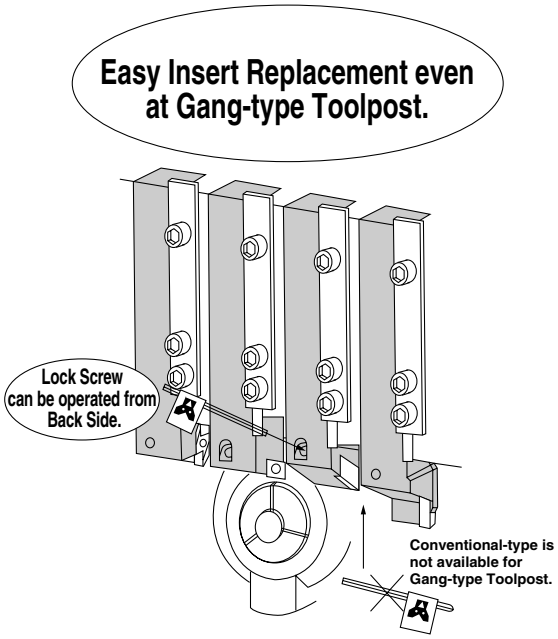
■ Small Shank Toolholders

Application	External/Facing	External/Facing/Copying		External/Facing/ Copying/Undercutting	External/Copying			
Cutting Edge Angle	95°	100°	105°	117.5°	62.5°	72.5°	93°	95°
Back Clamp (Without Offset)	ACLC-F				ADNC-F	AVVB-F	ADJC-F / AVJB-F	
Ref. Page	130				134	140	136 / 141	
Screw Clamp (Without Offset)		SYXP-F			SDNC-F		SDJC-F / SVJB-F	SDLP-F
Ref. Page		139			135		137 / 141	138
Screw Clamp (With Offset)	SCLC		SDXC	SVPB	SDNC	SVVB	SDJC / SVJB	
Ref. Page	131		138	142	135	140	137 / 141	
Top Clamp								
Ref. Page								



● Back Clamp (Anchor Pin Clamp) System

1. Lock Screw can be operated from back side and it realizes very easy Insert replacement and application to Swiss-type Automatic Lathe (Fig. 1)
2. Easy Insert Replacement by slightly turning the wrench
3. Rigid clamp by Anchor Pin and Lock Screw (Fig. 2)



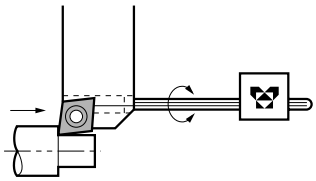


Fig. 1

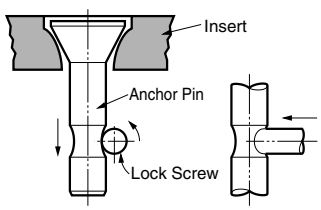
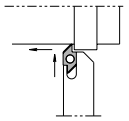
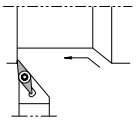
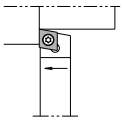
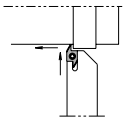
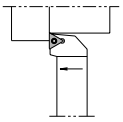
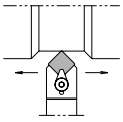
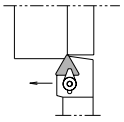
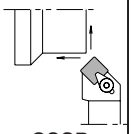
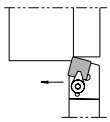
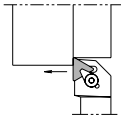
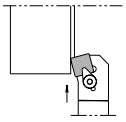
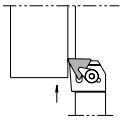
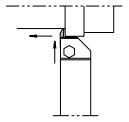


Fig. 2

External/Chamfering		External/Facing/ Chamfering	External			Facing		Back Turning
95°	45°	60°	45°	75°	90°	91°	15°	-1°	
									 AABW,AABS 126～128
 SVLP-F 142					 SCAC 131				 SABW,SABS 126～128
						 STGC,STGP 132			
	 CSDP 144	 CTTP 133	 CSSP 144	 CSBP 143		 CTGP 133	 CSKP 143	 CTFP 133	 CAB 129

● "Super Fine" Edge for High Quality and Long Tool Life

· Available for Mechatronics, Electronics and High Precision Machining Parts

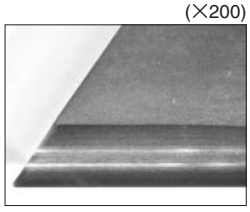
· Available for the Demand of Sub-Micron Accuracy

High Quality Ground Insert

· Great Reduction of Micro-chippingat grinding Edges

· Extremely Less Welding · Long Tool Life

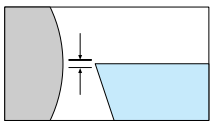
(×200)



Super Fine

E-class Turning Insert

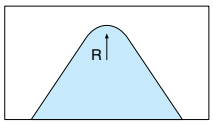
· Accuracy Index Position after Insert Replacement



Tickness Tolerance

±0.13mm → ±0.025mm

Conventional — Super Fine



Corner-R Tolerance

±0.1mm → ±0.02mm

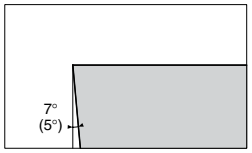
Conventional — Super Fine

Positive "P (11°)" Insert

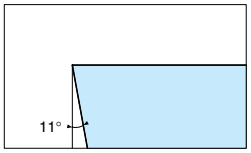
· Great Reduction of Cutting Force

· Higher Machining Accuracy & Stable Dimension

· Elimination of Subsequent Grinding Process



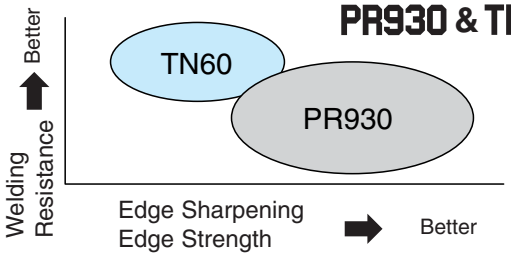
Conventional Positive "C" (B)



Super Fine Positive "P"

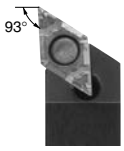
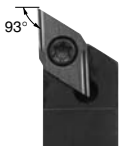
Best Combination for Higher Precision Machining

PR930 & TN60

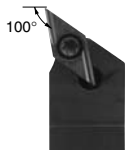


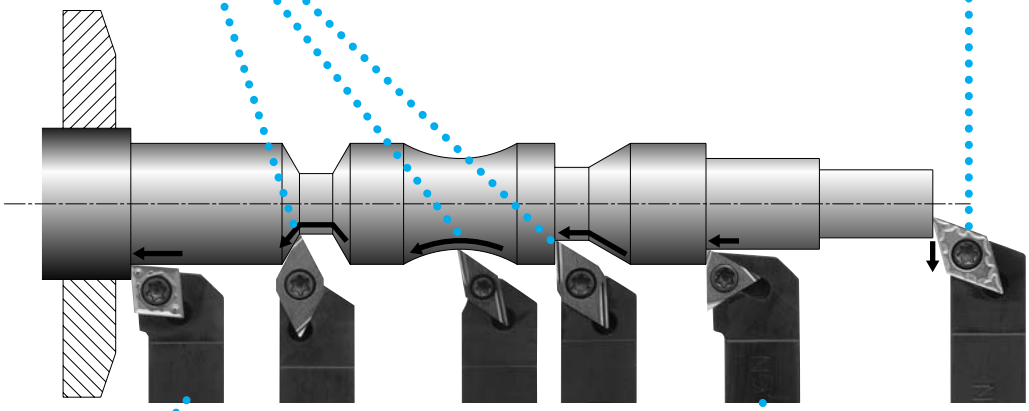
Summary of Turning

External / Copying

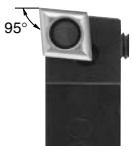
 ADNC-F	 SDNC-F	 SDNC	
Back Clamp □8～16 Without Offset	Screw Clamp □10～16 Without Offset	Screw Clamp □8～16 With Offset	
P.134	P.135	P.135	
 ADJC-F	 SDJC-F	 SDJC	 SDLP-F
Back Clamp □8～16 Without Offset	Screw Clamp □8～16 Without Offset	Screw Clamp □8～25 With Offset	Screw Clamp □8～16 Without Offset
P.136	P.137	P.137	P.138

External / Facing / Copying

 SDXC	 SYXP-F
Screw Clamp □8～16 With Offset	Screw Clamp □8～10 Without Offset
P.138	P.139



External / Facing

 ACLC-F	 SCLC
Back Clamp □8～16 Without Offset	Screw Clamp □8～25 With Offset
P.130	P.131

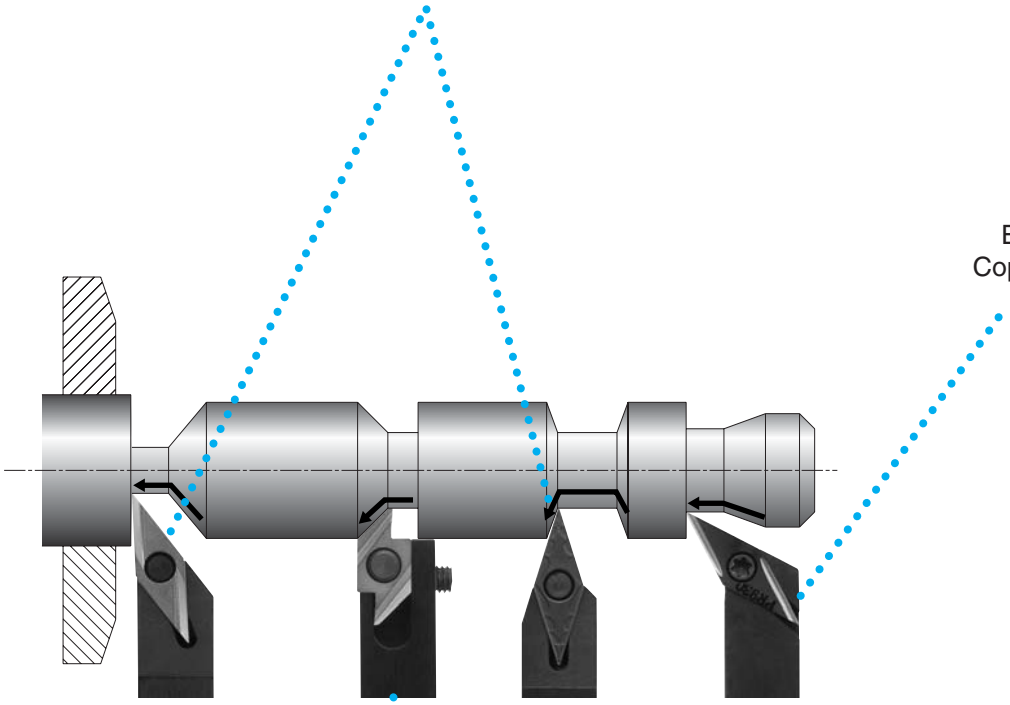
External

 SCAC	 STGC(P)
Screw Clamp □8～16 Without Offset	Screw Clamp □8～25 With Offset
P.131	P.132

Summary of Turning

 AVVB-F	 SVVB	 AVJB-F	 SVJB-F	 SVJB	 SVLP-F
Back Clamp □10～16 Without Offset	Screw Clamp □10～25 With Offset	Back Clamp □10～16 Without Offset	Screw Clamp □10～16 Without Offset	Screw Clamp □20～25 With Offset	Screw Clamp □10～16 Without Offset
P.140	P.140	P.141	P.141	P.141	P.142

External / Copying



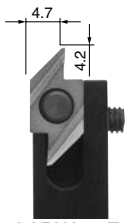
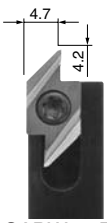
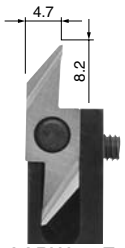
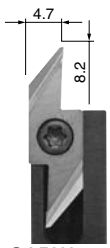
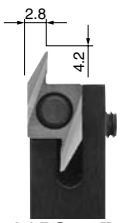
External / Facing /
Copying / Undercutting

SVPB

Screw Clamp
□10～25
With Offset

P.142

Back Turning

 AABW-40F	 SABW-40F	 AABW-50F	 SABW-50	 AABS-40F	 SABS-40F
Back Clamp □8～16 Edge Width : 4.7 *ap* : ～4.0	Screw Clamp □8～16 Edge Width : 4.7 *ap* : ～4.0	Back Clamp □8～16 Edge Width : 4.7 *ap* : ～5.0	Screw Clamp □8～16 Edge Width : 4.7 *ap* : ～5.0	Back Clamp □8～16 Edge Width : 2.8 *ap* : ～4.0	Screw Clamp □8～16 Edge Width : 2.8 *ap* : ～4.0
P.126	P.126	P.127	P.127	P.128	P.128

Summary of Boring

Min.Bore Dia. ϕ2～

SVN P.156

Shank □10～25
Square Shank (Straight)

S···SVN P.157

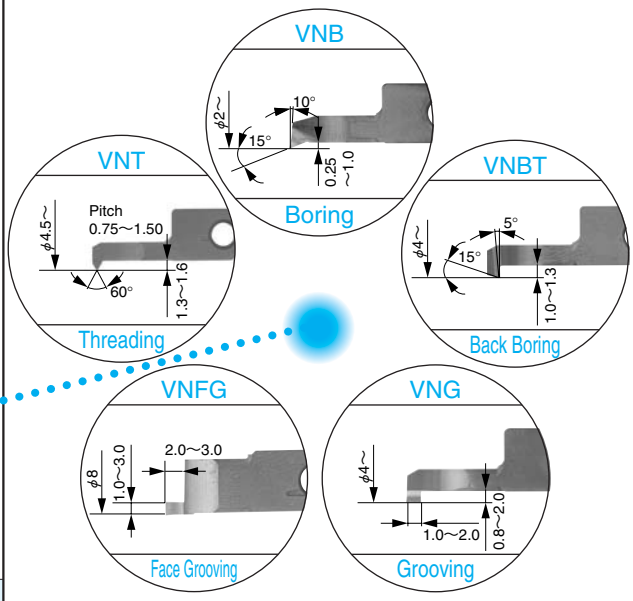
Shank ϕ12～25.4
Round Shank (Standard)

S···SVN-S P.157

Shank ϕ12～25.4
Round Shank (Straight)

SVNS P.156

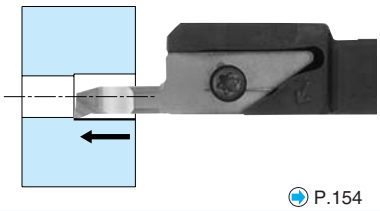
Shank □10～16
Square Shank (L-shape)



Toolholder

Boring

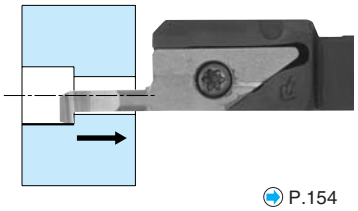
VNB
(System Tip-Bar)
Min.Bore Dia. ϕ2～7
Corner-R 0.03,0.2



P.154

Back Boring

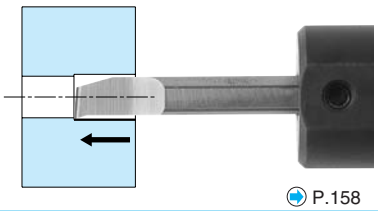
VNBT
(System Tip-Bar)
Min.Bore Dia. ϕ4～5
Corner-R 0.03,0.1



P.154

Boring

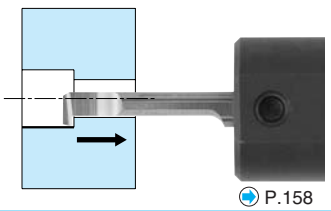
PSB
(Tip-Bar)
Min.Bore Dia. ϕ2～7
Corner-R 0.05



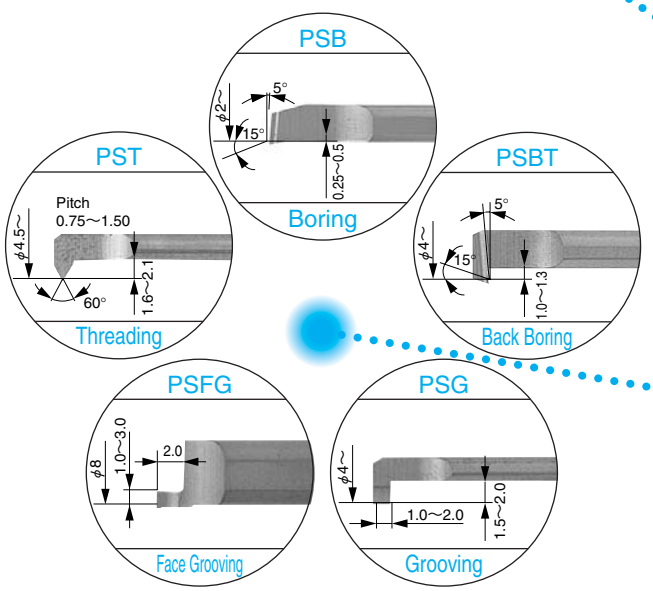
P.158

Back Boring

PSBT
(Tip-Bar)
Min.Bore Dia. ϕ4～5
Corner-R 0.05



P.158



Sleeve

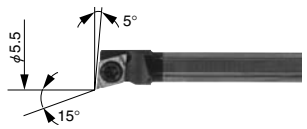
PH P.159

Shank ϕ12, ϕ16
Round Shank Sleeve

Summary of Boring

Min.Bore Dia. ϕ5〜

P.180

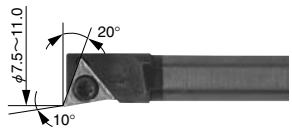


C···SJLC Carbide Shank

Min.Bore Dia. : ϕ5.5
Max. Overhang Length : L/D=〜7

· Relief Angle 15° and Convenient at Undercutting

P.171



C···STXP (B) Carbide Shank

Min.Bore Dia. : ϕ7.5〜11
Max. Overhang Length : L/D=〜7

· Relief Angle 20° and Less Cutting Resistance at Boring

P.167

S···SWUB Steel Shank

Min.Bore Dia. : ϕ6〜8
Max. Overhang Length : L/D=〜3

P.160

S···SCLC-E Excellent Shank

Min.Bore Dia. : ϕ5〜8
Max. Overhang Length : L/D=〜5

P.167

C···SWUB Carbide Shank

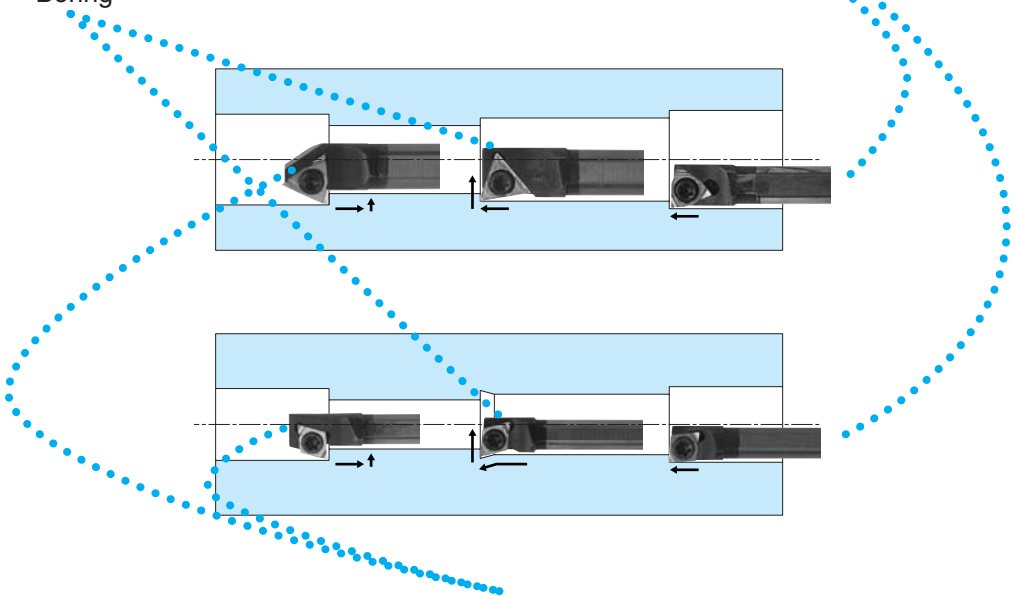
Min.Bore Dia. : ϕ6〜8
Max. Overhang Length : L/D=〜7

P.160

C···SCLC Carbide Shank

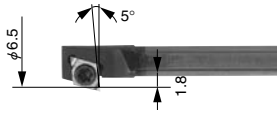
Min.Bore Dia. : ϕ5〜8
Max. Overhang Length : L/D=〜7

Boring



Back Boring

P.180

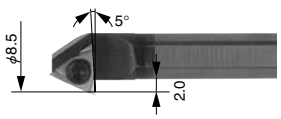


C···SJZC Carbide Shank

Min.Bore Dia. : ϕ6.5
Max. Overhang Length : L/D=〜7

· Cutting Edge Distance 1.8 mm
· Suitable for Back Boring at High Concentricity Requirement

P.171



C···STZB Carbide Shank

Min.Bore Dia. : ϕ8.5
Max. Overhang Length : L/D=〜7

· Cutting Edge Distance 2.0 mm
· Suitable for Back Boring at High Concentricity Requirement

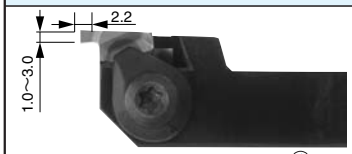
Summary of Grooving

VNFG (System Tip-Bar) P.245

Min.Face Grooving Dia. : ϕ8
Width : 1.0~3.0
Depth : 2.0~3.0

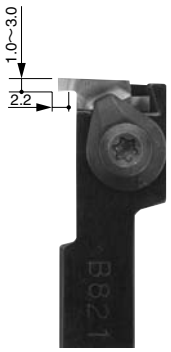
PSFG (Tip-Bar) P.246

Min.Face Grooving Dia. : ϕ8
Width : 1.0~3.0
Depth : 2.0



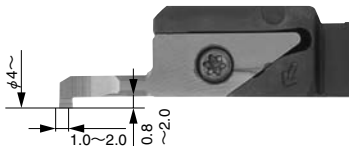
GFVS-AA P.247

Min.Face Grooving Dia. : ϕ8
Shank : □10~25
Width : 1.0~3.0
Depth : 2.2



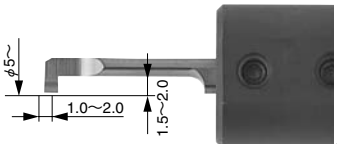
GFVT-AA P.248

Min.Face Grooving Dia. : ϕ8
Shank : □10~25
Width : 1.0~3.0
Depth : 2.2



VNG (System Tip-Bar) P.230

Min.Bore Dia. : ϕ4~7
Width : 1.0~2.0
Depth : 0.8~2.0

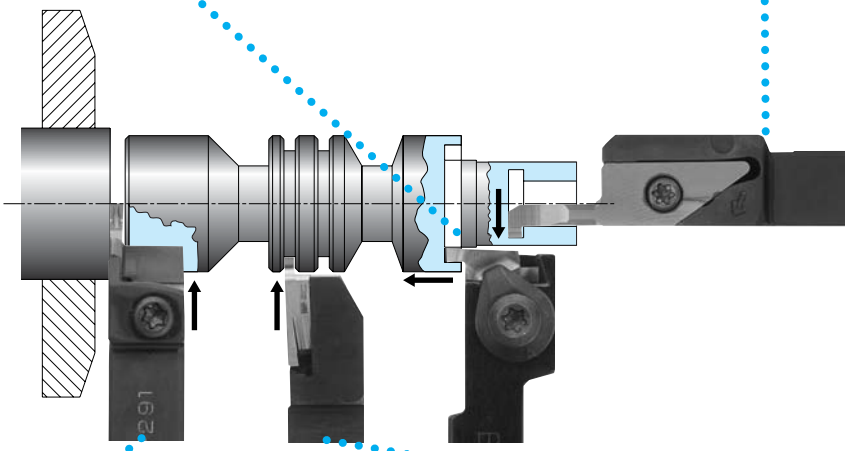


PSG (Tip Bar) P.231

Min.Bore Dia. : ϕ5~8
Width : 1.0~2.0
Depth : 1.5~2.0

Internal Grooving

Face Grooving



Cutting Off

KGM

Top Clamp
Cutting Dia. : ~ϕ32
Shank : □8~16
Width : 1.5~4.0

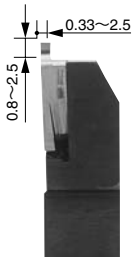
P.278

KGMB

Top Clamp
Cutting Dia. : ~ϕ20
Shank : □8~16
Width : 1.5~2.0

P.282

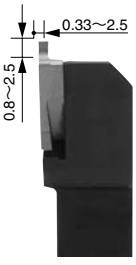
External Grooving



KTGF-F

Screw Clamp
Without Offset
Shank : □10~16
Width : 0.33~2.5
Depth : 0.8~2.5

P.212

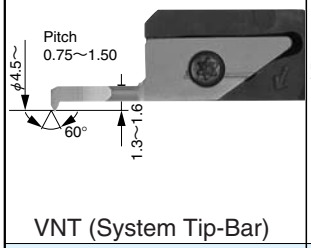


KTGF

Screw Clamp
With Offset
Shank : □10~25
Width : 0.33~2.5
Depth : 0.8~2.5

P.212

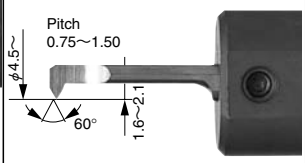
Summary of Threading



VNT (System Tip-Bar)

Min.Bore Dia. : ϕ4.5~6.0
M : 0.75~1.50
UN : 28~18

P.294



PST (Tip-Bar)

Min.Bore Dia. : ϕ4.5~6.0
M : 0.75~1.50
UN : 28~18

P.295

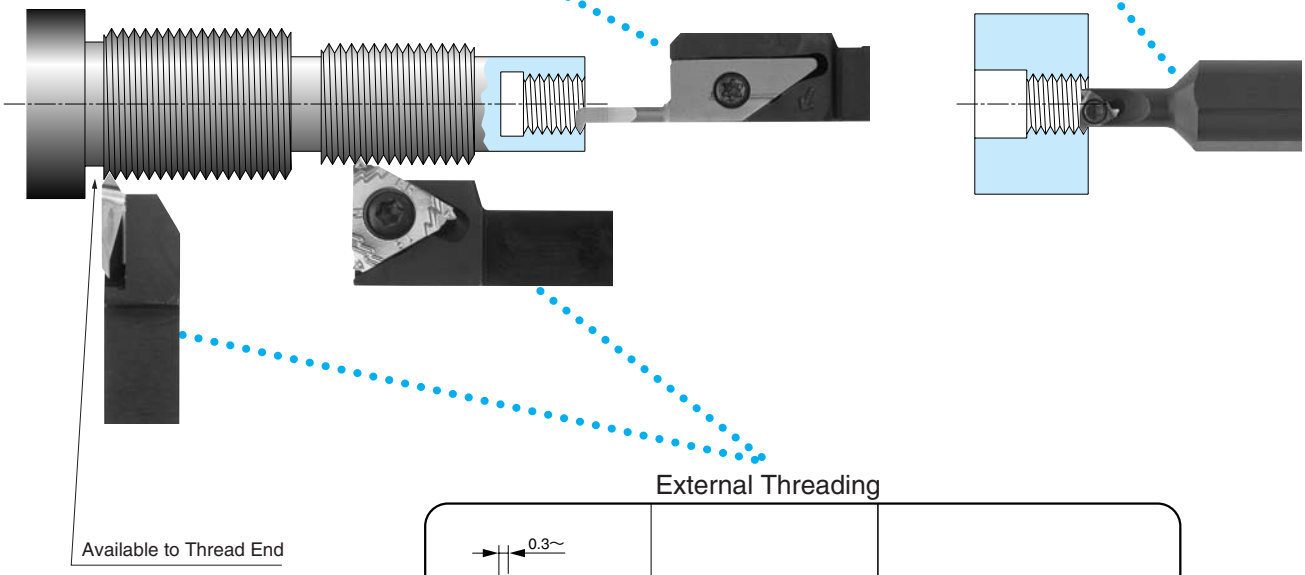
SIN-E

Min.Bore Dia. : ϕ6.4~7.8
M : 0.75~1.25
UN : 28~18
G : 28~19
W : 24~20
Rc : 28~19

P.296

M	: Metric	(mm)
UN	: Unified	(TPI)
G	: Parallel Pipe	(TPI)
W	: Whitworth	(TPI)
Rc	: Tapered Pipe	(TPI)
NPT	: American National Pipe	(TPI)
Tr	: 30° Trapezoidal	(mm)

Internal Threading



External Threading

KTTX

Shank : □10~20
Without Offset
M : 0.5~2.0
UN : 56~14
G : 28~11
W : 24~14
R : 28~11

P.293

KTT

Shank : □10~25
With Offset
M : 0.5~2.5
UN : 56~10
G : 28~11
W : 24~10
R : 28~11

P.292

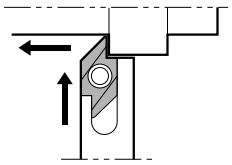
KTNS

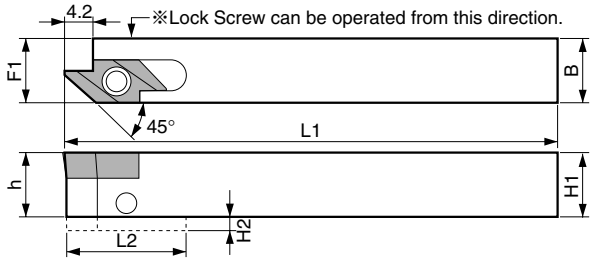
Shank : □10~20
With Offset
M : 0.5~2.5
UN : 24~11
G : 28~11
W : 24~9
R : 28~11
NPT : 18~11.5
Tr : 2.0~3.0

P.290

Toolholders for Back Turning [ABW15 Insert] Back Clamp/Screw Clamp

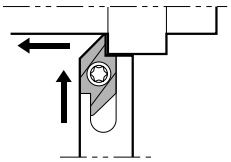
■ AABW-40F (Edge Width 4.7mm, Max. a*p* 4mm)

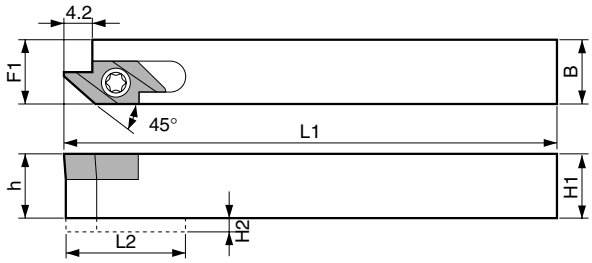




● Right-hand Shown

■ SABW-40F (Edge Width 4.7mm, Max. a*p* 4mm)



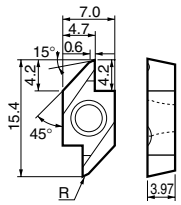


● Right-hand Shown

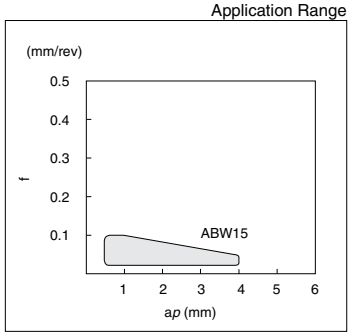
● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	H2	B	L1	L2	F1	Std. Corner-R	Spare Parts: Anchor Pin	Lock Screw	Clamp Screw	Wrench
AABW R/L	0810K-40F	○			8	2	10	125	18.5	10.2	0.15	LPA-11 / LPA-13 / LPA-17	HSB4X8R	-	FH-2
	1010K-40F	●		●	10	-	10	125	-	10.2					
	1212M-40F	●		●	12	-	12	150	-	12.2					
	1616M-40F	●		●	16	-	16	150	-	16.2					
SABW R/L	0810K-40F	●			8	2	10	125	18.5	10.2	0.15	-	-	SB-3080TR	FT-10
	1010K-40F	●		●	10	-	10	125	-	10.2					
	1212M-40F	●		●	12	-	12	150	-	12.2					
	1616M-40F	●		●	16	-	16	150	-	16.2					
	2020K-40F	●			20	-	20	125	-	20.2					

● Applicable Insert

Shape (Right-hand Shown)	Description	Corner-R (mm)	Insert Grade: Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10
	ABW15 R/L 4005	R0.05	R	R	●	R
	ABW15 R/L 4015	R0.15	R	R	●	R

Application Range



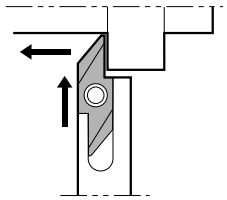
◆ Recommended Cutting Conditions

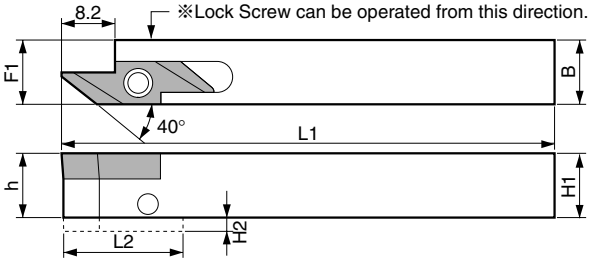
Work Material		Grooving	Traversing
General Steel	Vc (m/min)	80～100	
	f (mm/rev)	0.02	0.02～0.07
Stainless Steel	Vc (m/min)	30～50	
	f (mm/rev)	0.02	0.02～0.05
Non-ferrous Metal	Vc (m/min)	150～200	
	f (mm/rev)	0.02	0.02～0.10

●: Std. Stock ○: Check Availability R: R-hand Only

Toolholders for Back Turning [ABW23 Insert] Back Clamp/Screw Clamp

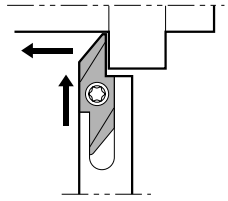
AABW-50F (Edge Width 4.7mm, Max. a*p* 5mm)

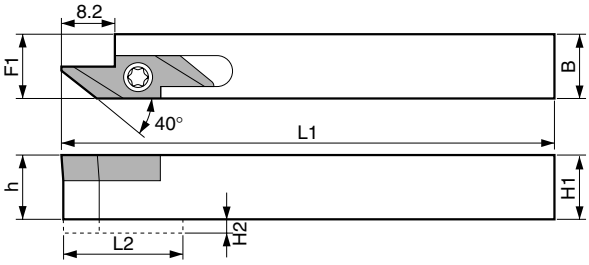




● Right-hand Shown

SABW-50F (Edge Width 4.7mm, Max. a*p* 5mm)



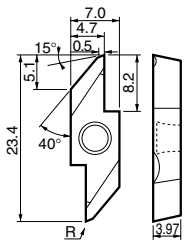


● Right-hand Shown

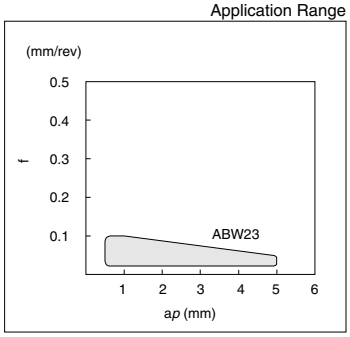
● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	H2	B	L1	L2	F1	Std. Corner-R	Spare Parts: Anchor Pin	Lock Screw	Clamp Screw	Wrench
AABW R/L	0810K-50F	●			8	2	10	125	18.5	10.2	0.15	LPA-11	HSB4X8R	-	FH-2
	1010K-50F	○			10	-	10	125	-	10.2					
	1212M-50F	●			12	-	12	150	-	12.2		LPA-13			
	1616M-50F	○			16	-	16	150	-	16.2		LPA-17			
SABW R/L	0810K-50F	○			8	2	10	125	18.5	10.2	0.15	-	-	SB-3080TR	FT-10
	1010K-50F	●			10	-	10	125	-	10.2					
	1212M-50F	●			12	-	12	150	-	12.2					
	1616M-50F	●			16	-	16	150	-	16.2					
	2020K-50F	●			20	-	20	125	-	20.2					

● Applicable Insert

Shape (Right-hand Shown)	Description	Corner-R (mm)	Insert Grade: Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10
	ABW23 R/L 5005	R0.05	R	R	R	R
	ABW23 R/L 5015	R0.15	R	R	R	R

Application Range



◆ Selection of Insert Shape

- For Stable Machining → ABW15 type
- For Smaller Lead Angle → ABS15 type
- For a*p* more than 4mm → ABW23 type

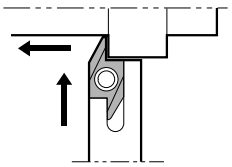
◆ Selection of Insert Grade

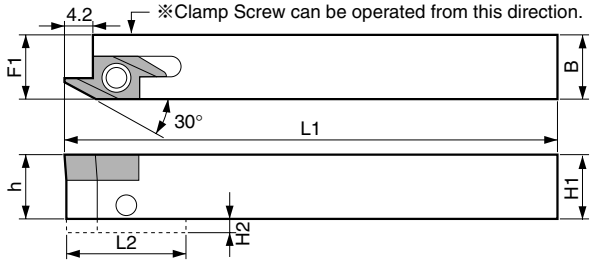
- General Steel → Cermet TC60
- Steel & Free Cutting Steel → Coated PR630 · PR930
- Non-Ferrous Metal → Carbide KW10
- Small Diameter and Low Cutting Speed (V_C=30m/min and below) → Coated PR930/Carbide KW10

●: Std. Stock ○: Check Availability R: R-hand Only

Toolholders for Back Turning [ABS15 Insert] Back Clamp/Screw Clamp

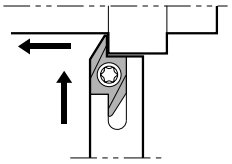
■ AABS-40F (Edge Width 2.8mm, Max. a*p* 4mm)

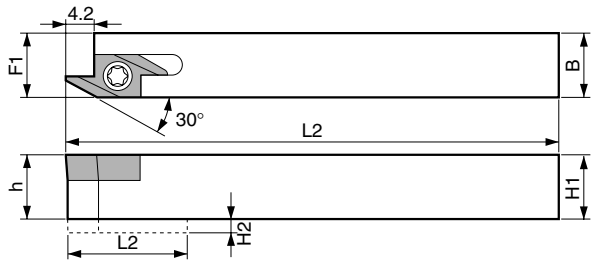




● Right-hand Shown

■ SABS-40F (Edge Width 2.8mm, Max. a*p* 4mm)



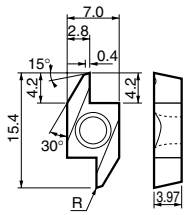


● Right-hand Shown

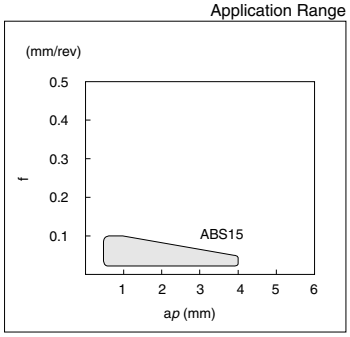
● Toolholder Dimension

Description		Stock			Dimension (mm)						Std. Corner-R	Spare Parts			
		R	N	L	H1=h	H2	B	L1	L2	F1		Anchor Pin	Lock Screw	Clamp Screw	Wrench
AABS R/L	**0810K-40F**	●			8	2	10	125	18.5	10.2	0.15	**LPA-11**	**HSB4X8R**	**-**	**FH-2**
	1010K-40F	●			10	-	10	125	-	10.2					
	1212M-40F	●			12	-	12	150	-	12.2		**LPA-13**			
	1616M-40F	○			16	-	16	150	-	16.2		**LPA-17**			
SABS R/L	**0810K-40F**	○			8	2	10	125	18.5	10.2	0.15	**-**	**-**	**SB-3080TR**	**FT-10**
	1010K-40F	○			10	-	10	125	-	10.2					
	1212M-40F	●			12	-	12	150	-	12.2					
	1616M-40F	●			16	-	16	150	-	16.2					
	2020K-40F	●			20	-	20	125	-	20.2					

● Applicable Insert

Shape (Right-hand Shown)	Description	Corner-R (mm)	Insert Grade			
			Cermet	PVD Coated		Carbide
			TC60	**PR630**	**PR930**	**KW10**
	**ABS15 R/L 4005**	R0.05	R	R	R	R
	ABS15 R/L 4015	R0.15	R	R	R	R

Application Range

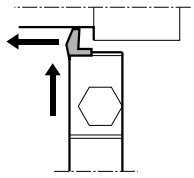


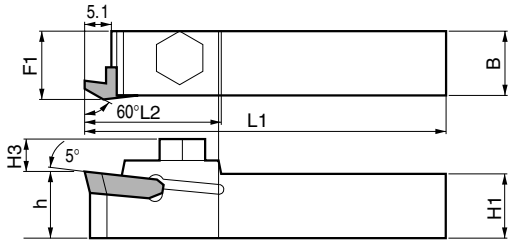
●: Std. Stock ○: Check Availability R: R-hand Only

Toolholders for Back Turning [AB12 Insert]

Bolt Clamp

■ CAB



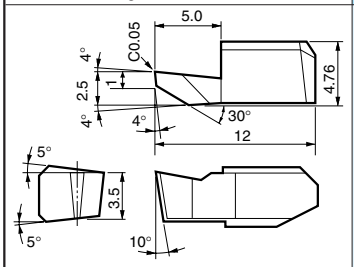


● Right-hand Shown

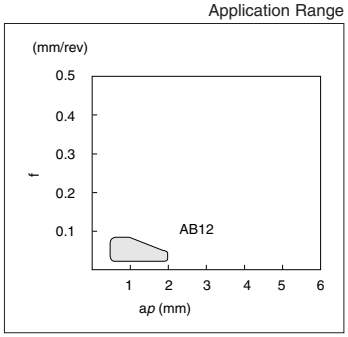
● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Bolt	Spaner
CAB R/L	1010K-25F	●			10	-	6	10	125	20	10.3	-	BM4X9	S-7
	1212M-25F	●			12	-	6	12	150	20	12.3			
	1616M-25F	○			16	-	6	16	150	20	16.3			
	2020K-25F	○			20	-	6	20	125	20	20.3			

● Applicable Insert

Shape (Right-hand Shown)	Description	Insert Grade: Cermet	Carbide
		TC60	KW10
	AB12 R/L 250	R	R

Application Range

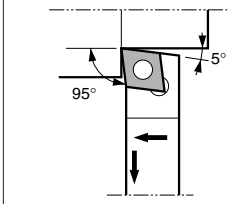


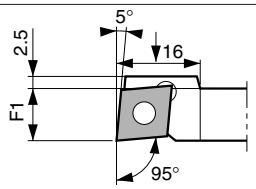
◆ Recommended Cutting Conditions

Work Material		Grooving	Note) Traversing	Cutting Off
General Steel	Vc (m/min)	80～100		
	f (mm/rev)	0.02	0.02～0.05	0.02
Stainless Steel	Vc (m/min)	30～50		
	f (mm/rev)	0.02	0.02～0.05	0.02
Non-ferrous Metal	Vc (m/min)	150～200		
	f (mm/rev)	0.02	0.02～0.06	0.02

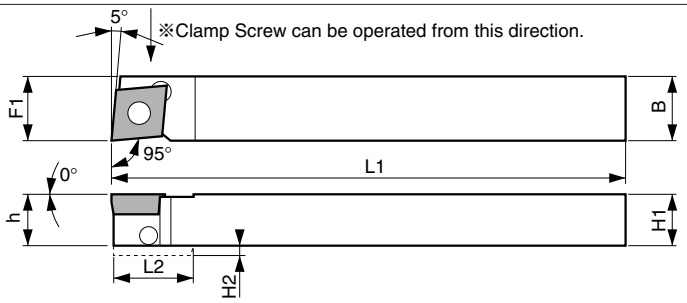
Note) Max D.O.C.=2mm (Traversing)

■ ACLC-F (External/Facing)





ACLC□1010K-09F shows above Figue.



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	H2	B	L1	L2	F1	Std. Corner-R	Spare Parts: Anchor Pin	Lock Screw	Wrench
ACLC□	0810K-06F	●		●	8	2	10	125	19	10.5	0.2	LPF-11	HSB4X8□	FH-2
	1010K-06F	●		●	10	-	10	125	-	10.5				
	1010K-09F	●		●	10	2	10	125	16	10.0	0.2	LPF-13		
	1212M-09F	●		●	12	-	12	150	-	12.5				
	1616M-09F	●		●	16	-	16	150	-	16.5		LPF-17		

● Lock Screw : HSB4×8R for R-hand Toolholder, HSB4×8L for L-hand Toolholder

● Applicable Insert

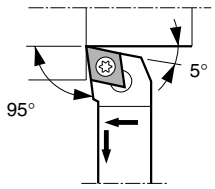
Application	Finishing-Medium	Medium	Medium	Medium	Finishing-Medium	Medium	Low Feed	Low Feed/Precision	Cast Iron	Non-ferrous Metal	Non-ferrous Metal
Ref. Page	57	57	58	58	59	59	59	59	59	58	59
Shape / Toolholder	HQ	Conventional	GK	HF	□-FS	FN-Z	(E/F) □-U	F□-USF	No Chipbreaker	AH	□-A3
ACLC□...-06F	CCMT0602..	CCGT0602..	CCMT0602..	-	CCGT0602..	CCGT0602..	CCGT0602..	CCET0602..	CCGW0602..	-	-
ACLC□...-09F	CCMT09T3..	CCGT09T3.. CCMT09T3..	CCMT06T3..	CCMT09T3..	CCGT09T3..	CCGT09T3..	CCGT09T3..	CCET09T3..	CCGW09T3..	CCGT09T3..	CCGT09T3..

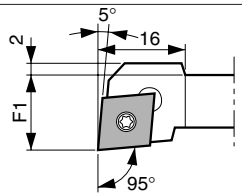
Application	Non-ferrous Metal	High Hard Mat'l
Ref. Page	460	446
Shape / Toolholder	Diamond	CBN
ACLC□...-06F	CCMT0602.. CCGW0602..	CCMW0602..
ACLC□...-09F	CCMT09T3.. CCGW09T3..	CCMW09T3..

●: Std. Stock ○: Check Availability

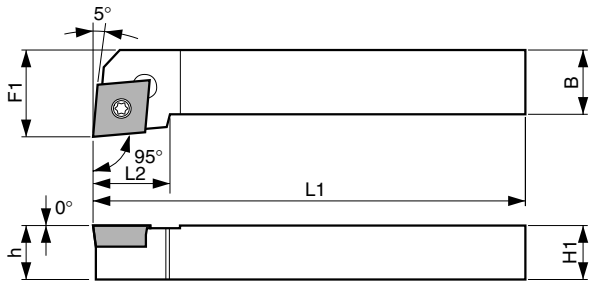
Toolholders for General Purpose [CC□□ Insert] Screw Clamp

■ SCLC (External/Facing)



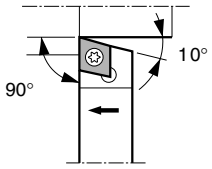


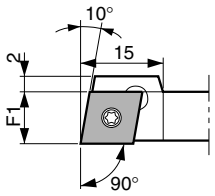
SCLC□1010F-09
shows above Figure.



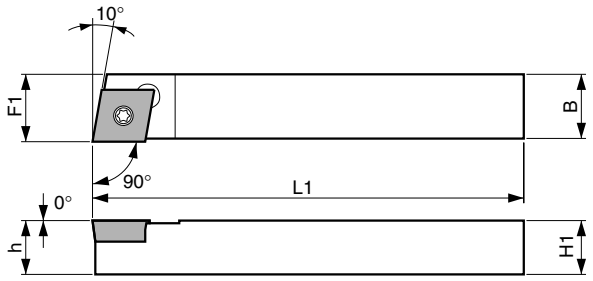
● Right-hand Shown

■ SCAC (External)





SCAC□1010K-09
shows above Figure.



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Screw	Wrench	Wrench
SCLC□	0808E-06	●		●	8	8	70	9	10	0.2	SB-2570TR	FT-8	-
	1010F-06	●		●	10	10	80	9	12				
	1010F-09	○		○	10	10	80	14	14	0.2	SB-4085TR	FT-15	-
	1212H-09	●		●	12	12	100	14	16				
	1616H-09	●		●	16	16	100	15	20				
	2020K-09	●		●	20	20	125	20	25				
	2525M-09	●		●	25	25	150	22	32				
	1616H-12	○		○	16	16	100	20	24	0.4	SB-5090TR	-	LTW-20
	2020K-12	○		○	20	20	125	22	25				
	2525M-12	●		●	25	25	150	22	32				
SCAC□	0808K-06	●		●	8	8	125	-	8.5	0.2	SB-2570TR	FT-8	-
	1010K-06	○		●	10	10	125	-	10.5				
	1010K-09	○		○	10	10	125	-	10.5	0.2	SB-4085TR	FT-15	-
	1212M-09	●		●	12	12	150	-	12.5				
	1616M-09	●		●	16	16	150	-	16.5				

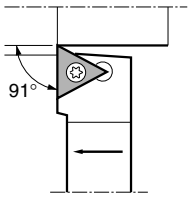
● Applicable Insert

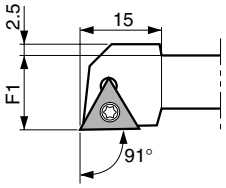
Application	Finishing-Medium	Medium	Medium	Medium	Low Feed	Low Feed/Precision	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Ref. Page	57	57	58	58	59	59	59	58	59	460	446
Shape / Toolholder	HQ	Conventional	GK	FG	(E/F) □-U	F□-USF	No Chipbreaker	AH	□-A3	Diamond	CBN
SCLC□...-06	CCMT0602..	CCGT0602..	CCMT0602..	-	CCGT0602..	CCET0602..	CCGW0602..	-	-	CCMT0602.. CCGW0602..	CCMW0602..
SCLC□...-09	CCMT09T3..	CCGT09T3.. CCMT09T3..	CCMT09T3..	-	CCGT09T3..	CCET09T3..	CCGW09T3..	CCGT09T3..	CCGT09T3..	CCMT09T3.. CCGW09T3..	CCMW09T3..
SCLC□...-12	-	-	-	CCMT1204..	-	-	-	-	CCGT1204..	CCMT1204..	CCMW1204..
SCAC□...-06	CCMT0602..	CCGT0602..	CCMT0602..	-	CCGT0602..	CCET0602..	CCGW0602..	-	-	CCMT0602.. CCGW0602..	CCMW0602..
SCAC□...-09	CCMT09T3..	CCGT09T3.. CCMT09T3..	CCMT09T3..	-	CCGT09T3..	CCET09T3..	CCGW09T3..	CCGT09T3..	CCGT09T3..	CCMT09T3.. CCGW09T3..	CCMW09T3..

● -06 type Toolholder…CCGT0602○○□-FS, CCGT0602○○FN-Z Insert are also applicable.
● -09 type Toolholder…CCMT09T3○○HF, CCGT09T3○○□FS, CCGT09T3○○FN-Z Insert are also applicable.

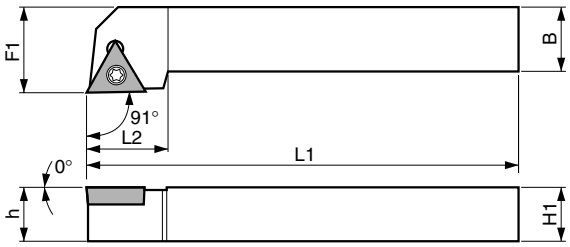
●: Std. Stock ○: Check Availability

■ STGC(P) (External)





STGC(P)R/L1010F-11
shows above Figure.



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	L2	F1			Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
STGCR/L	0808E-08	●		●	8	8	70	12	10			0.2	SB-2060TR	FT-8
	1010F-08	●		●	10	10	80	12	12					
	1010F-11	○		○	10	10	80	15	14			0.4	SB-2570TR	FT-8
	1212H-11	●		●	12	12	100	15	16					
	1616H-11	●		●	16	16	100	15	20					
	2020K-11	●		●	20	20	125	15	25					
	2525M-11	●		○	25	25	150	20	32					
STGPR/L	0808E-08	○		○	8	8	70	12	10			0.2	SB-2060TR	FT-8
	1010F-08	○		○	10	10	80	12	12					
	1010F-11	●		●	10	10	80	15	14			0.2	SB-3080TR	FT-10
	1212H-11	○		○	12	12	100	15	16					
	1616H-11	●		●	16	16	100	15	20					

● Applicable Insert (**STGC**)

Application	Low Feed	Low Feed/Precision	Cast Iron	Non-ferrous Metal	Non-ferrous Metal
Ref. Page	64	64	65	65	460, 461
Shape / Toolholder	(E/F)R/L-U	FR/L-USF	No Chipbreaker	R/L-A3	Diamond
STGCR/L...-08	TCGT0802..	TCET0802..	TCGW0802..	-	TCMT0802..
STGCR/L...-11	TCGT1103..	TCET1103..	TCGW1103..	TCGT1103..	TCMT1103.. TCGW1103..

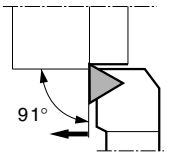
● Applicable Insert (**STGP**)

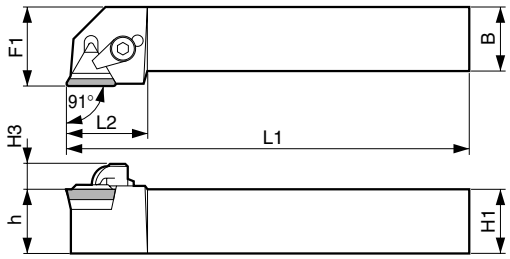
Application	Minute ap	Finishing-Medium	Finishing	Finishing/Precision	Medium	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	62	63	64	64	64	64	63	63	65	460, 461	447
Shape / Toolholder	CF	HQ	R/L	R/L-FSF	R/L-H	FR/L-USF	XP	XQ	No Chipbreaker	Diamond	CBN
STGPR/L...-08	TPGT0802..	-	TPGH0802..	TPET0802..	-	TPET0802..	-	-	TPGB0802..	TPMH0802.. TPGB0802..	TPGB0802..
STGPR/L...-11	-	TPMT1103..	TPGH1103..	TPET1103..	TPGH1103..	TPET1103..	TPMT1103..	TPMT1103..	TPGB1103..	TPMH1103.. TPGB1103..	TPGB1103..

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [TP□□ Insert] — Top Clamp

CTGP (External)

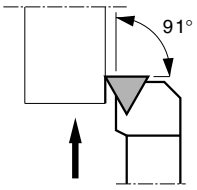


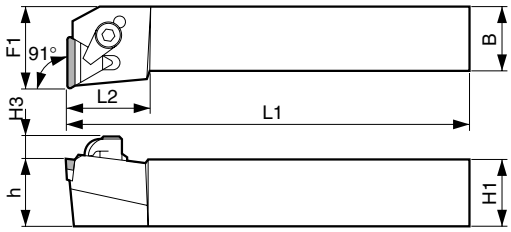


Side Rake Angle : +6°
Angle of Inclination : 0°

● Right-hand Shown

CTFP (Facing)

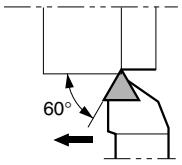


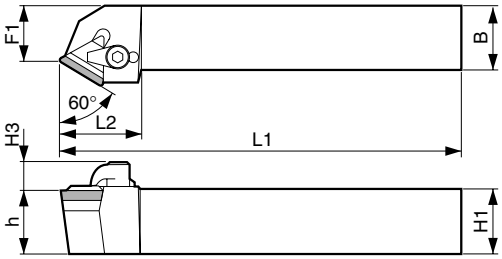


Side Rake Angle : +6°
Angle of Inclination : 0°

● Right-hand Shown

CTTP (External/Chamfering)





Side Rake Angle : +6°
Angle of Inclination : 0°

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Chipbreaker	Shim	Shim Screw
CTGP R/L	1212F-11N	●		○	12	8	12	80	18	16	0.4	CPS-2P	LW-2.5	CB-T2212	-	-
	1616H-11N	●		●	16	8	16	100	18	20						
	2020K-16N	●		○	20	8.5	20	125	26	25	0.8	CPS-3	LW-3	CB-T3220	KPT-32	SP3X8
	2525M-16N	●		●	25	8.5	25	150	26	32						
CTFP R/L	1212F-11N	○		○	12	8	12	80	18	16	0.4	CPS-2P	LW-2.5	CB-T2212	-	-
	1616H-11N	○		○	16	8	16	100	18	20						
	2020K-16N	○		○	20	8.5	20	125	22	25	0.8	CPS-3	LW-3	CB-T3220	KPT-32	SP3X8
	2525M-16N	○		○	25	8.5	25	150	22	32						
CTTP R/L	1212F-11N	○		○	12	8	12	80	21	9	0.4	CPS-2P	LW-2.5	CB-T2212	-	-
	1616H-11N	○		○	16	8	16	100	21	13						
	2020K-16N	○		○	20	8.5	20	125	28	17	0.8	CPS-3	LW-3	CB-T3220	KPT-32	SP3X8
	2525M-16N	○		○	25	8.5	25	150	28	22						

● Chipbreaker is not attached. Prepare separately.

● Applicable Insert

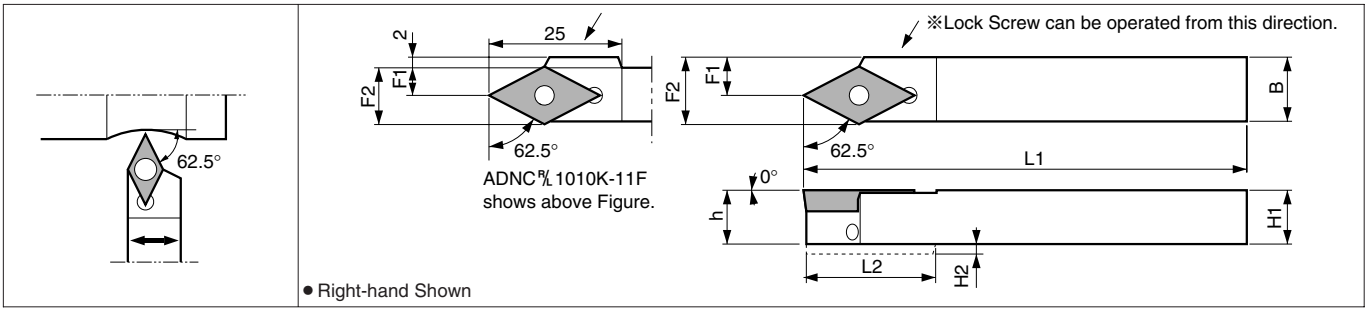
Application	Finishing	Finishing	Finishing-Medium	Medium	Medium	Finishing-Medium	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	66	66	66	66	66	67	67	86	462	448
Shape / Toolholder	GP	DP	HQ	G	Conventional	R/L-□	No Chipbreaker	Ceramic	Diamond	CBN
CTGP R/L...-11N	TPMR1103..	TPMR1103.. TPGR1103..	TPMR1103..	TPMR1103..	TPMR1103..	TPGR1103..	TPMN1103.. TPGN1103..	TPGN1103..	TPGN1103..	TPGN1103..
CTGP R/L...-16N	TPMR1603..	TPMR1603.. TPGR1603..	TPMR1603..	TPMR1603..	TPMR1603..	TPGR1603..	TPMN1603.. TPGN1603..	TPGN1603..	TPGN1603..	TPGN1603..
CTFP R/L ...-11N	TPMR1103..	TPMR1103.. TPGR1103..	TPMR1103..	TPMR1103..	TPMR1103..	TPGR1103..	TPMN1103.. TPGN1103..	TPGN1103..	TPGN1103..	TPGN1103..
CTFP R/L ...-16N	TPMR1603..	TPMR1603.. TPGR1603..	TPMR1603..	TPMR1603..	TPMR1603..	TPGR1603..	TPMN1603.. TPGN1603..	TPGN1603..	TPGN1603..	TPGN1603..
CTTP R/L ...-11N	TPMR1103..	TPMR1103.. TPGR1103..	TPMR1103..	TPMR1103..	TPMR1103..	TPGR1103..	TPMN1103.. TPGN1103..	TPGN1103..	TPGN1103..	TPGN1103..
CTTP R/L ...-16N	TPMR1603..	TPMR1603.. TPGR1603..	TPMR1603..	TPMR1603..	TPMR1603..	TPGR1603..	TPMN1603.. TPGN1603..	TPGN1603..	TPGN1603..	TPGN1603..

● CTFP R/L: L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [DC□□ Insert] — Back Clamp

■ ADNC-F (External/Copying)



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H2	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts: Anchor Pin	Spare Parts: Lock Screw	Spare Parts: Wrench
ADNCR/L	0810K-07F	●		●	8	2	10	125	19	7.0	10.5	0.2	LPF-11	HSB4X8R/L	FH-2
	1010K-07F	●		●	10	-	10	125	-	7.0	10.5				
	1010K-11F	●		○	10	2	10	125	25	4.5	10.5		LPF-13		
	1212M-11F	●		●	12	-	12	150	-	7.0	12.5	0.2			
	1616M-11F	●		●	16	-	16	150	-	11.0	16.5		LPF-17		

● Lock Screw : HSB4×8R for R-hand Toolholder, HSB4×8L for L-hand Toolholder

● Applicable Insert

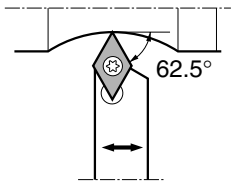
Application	Minute ap	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed
Ref. Page	69	69	69	70	70	70	70	70	71	71	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	R/L-F	R/L-FSF	R/L-FS	(E/F)N-Z	(E/F)R/L-U
ADNCR/L...-07F	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
ADNCR/L...-11F	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..

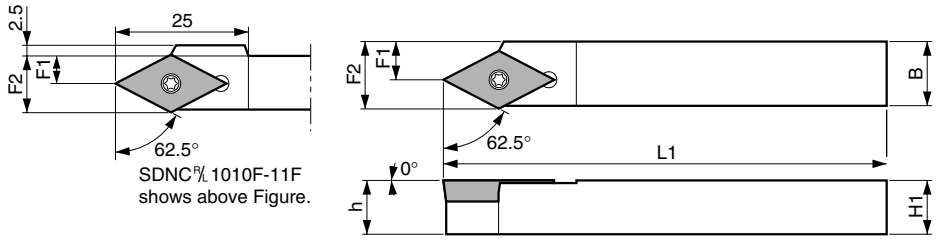
Application	Finishing/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Ref. Page	71	71	71	70	70	72	70	72	462	448, 449	
Shape / Toolholder	FR/L-USF	(E/F)R/L-J	FR/L-JSF	XP	XQ	No Chipbreaker	AH	R/L-A3	Diamond	CBN	
ADNCR/L...-07F	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
ADNCR/L...-11F	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [DC□□ Insert] Screw Clamp

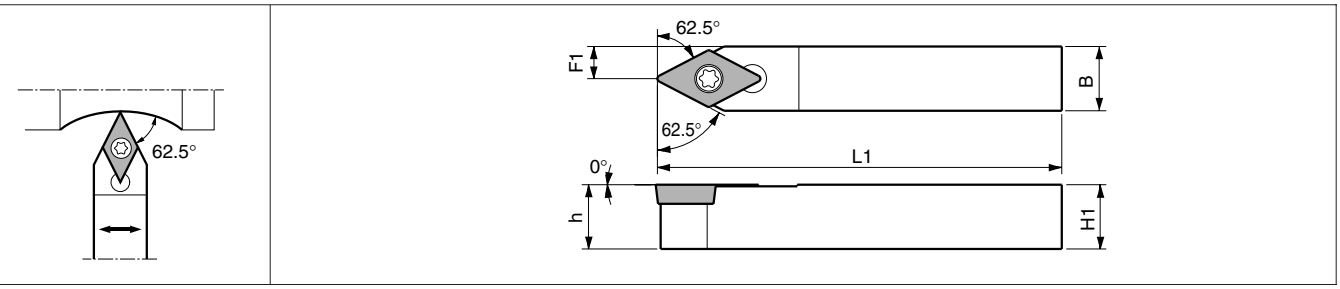
■ SDNC-F (External/Copying)





● Right-hand Shown

■ SDNC (External/Copying)



● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	F1	F2	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
SDNC□	0808F-07F	●		●	8	8	80	5.0	8.5	0.2	SB-2570TR	FT-8
	1010F-07F	●		●	10	10	80	7.0	10.5			
	1010F-11F	○		○	10	10	80	4.5	10.5	0.2	SB-4085TR	FT-15
	1212H-11F	●		●	12	12	100	7.0	12.5			
	1616H-11F	●		●	16	16	100	11.0	16.5			
SDNCN	0808E-07		●		8	8	70	4.0	-	0.2	SB-2570TR	FT-8
	1010F-07		●		10	10	80	5.0	-			
	1212H-07		●		12	12	100	6.0	-			
	1010F-11		○		10	10	80	5.0	-	0.2	SB-4085TR	FT-15
	1212H-11		○		12	12	100	6.0	-			
	1616H-11		●		16	16	100	8.0	-			

● Applicable Insert

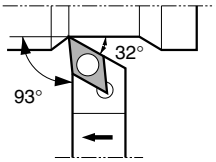
Application	Minute ap	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed
Ref. Page	69	69	69	70	70	70	70	70	71	71	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	□-F	□-FSF	□-FS	(E/F)N-Z	(E/F)□-U
SDNC□...-07F	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
SDNC□...-11F	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..
SDNCN ...-07	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
SDNCN ...-11	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..

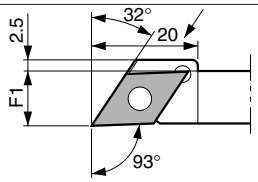
Application	Low Feed/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Ref. Page	71	71	71	70	70	72	70	72	462	448, 449	
Shape / Toolholder	F□-USF	(E/F)□-J	F□-JSF	XP	XQ	No Chipbreaker	AH	□-A3	Diamond	CBN	
SDNC□...-07F	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
SDNC□...-11F	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	
SDNCN ...-07	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
SDNCN ...-11	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	

●: Std. Stock ○: Check Availability

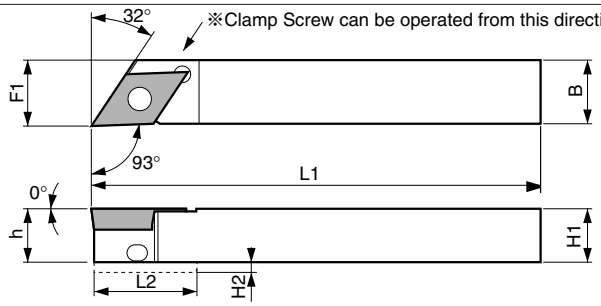
Toolholders for General Purpose [DC□□ Insert] Back Clamp

■ ADJC-F (External/Copying)





ADJC□1010K-11F shows above Figure.



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H2	B	L1	L2	F1	Std. Corner-R	Spare Parts: Anchor Pin	Lock Screw	Wrench
ADJC□	0810K-07F	●		●	8	2	10	125	19	10.5	0.2	LPF-11	HSB4X8□	FH-2
	1010K-07F	●		●	10	-	10	125	-	10.5				
	1010K-11F	●		○	10	2	10	125	20	10.0	0.2	LPF-13		
	1212M-11F	●		●	12	-	12	150	-	12.5				
	1616M-11F	●		●	16	-	16	150	-	16.5		LPF-17		

● Lock Screw : HSB4×8R for R-hand Toolholder, HSB4×8L for L-hand Toolholder

● Applicable Insert

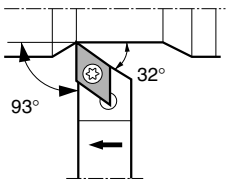
Application	Minute *ap*	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed
Ref. Page	69	69	69	70	70	70	70	70	71	71	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	□-F	□-FSF	□-FS	(E/F)N-Z	(E/F)□-U
ADJC□...-07F	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
ADJC□...-11F	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..

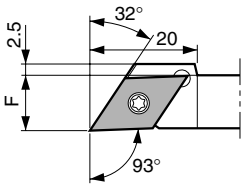
Application	Low Feed/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Ref. Page	71	71	71	70	70	72	70	72	462	448, 449	
Shape / Toolholder	F□-USF	(E/F)□-J	F□-JSF	XP	XQ	No Chipbreaker	AH	□-A3	Diamond	CBN	
ADJC□...-07F	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
ADJC□...-11F	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	

●: Std. Stock ○: Check Availability

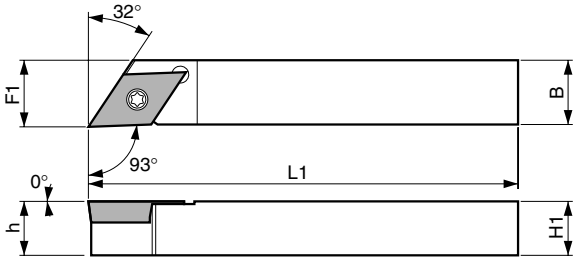
Toolholders for General Purpose [DC□□ Insert] — Screw Clamp

■ SDJC-F (External/Copying)



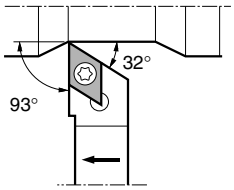


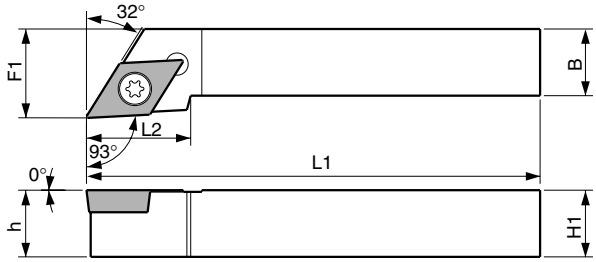
SDJC□1010F-11F shows above Figure.



● Right-hand Shown

■ SDJC (External/Copying)





● Right-hand Shown

● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Screw	Wrench
SDJC□	0808F-07F	●		●	8	8	80	-	8.5	0.2	SB-2570TR	FT-8
	1010F-07F	●		●	10	10	80	-	10.5			
	1010F-11F	●		○	10	10	80	-	10.0	0.2	SB-4085TR	FT-15
	1212H-11F	●		●	12	12	100	-	12.5			
	1616H-11F	●		●	16	16	100	-	16.5			
SDJC□	1010F-07	●		●	10	10	80	12	12	0.2	SB-2570TR	FT-8
	1010F-11	○		○	10	10	80	18	12	0.2	SB-4085TR	FT-15
	1212H-11	●		●	12	12	100	18	16			
	1616H-11	●		●	16	16	100	18	20			
	2020K-11	●		●	20	20	125	18	25			
	2525M-11	●		●	25	25	150	18	32			

● Applicable Insert

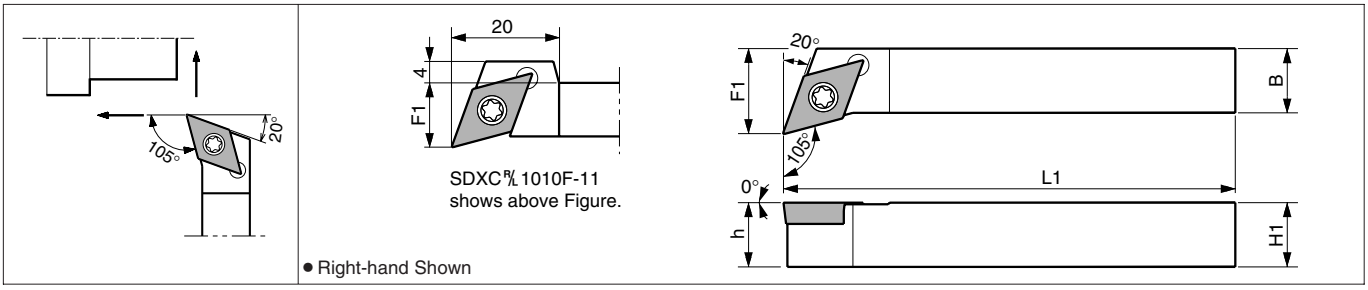
Application	Minute a_p	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed
Ref. Page	69	69	69	70	70	70	70	70	71	70	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	□-F	□-FSF	□-FS	(E/F)N-Z	(E/F)□-U
SDJC□...-07F	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
SDJC□...-11F	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..
SDJC□...-07	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..	DCGT0702..
SDJC□...-11	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..

Application	Low Feed/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Ref. Page	71	71	71	70	70	72	70	72	462	448, 449	
Shape / Toolholder	F□-USF	(E/F)□-J	F□-JSF	XP	XQ	No Chipbreaker	AH	□-A3	Diamond	CBN	
SDJC□...-07F	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
SDJC□...-11F	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	
SDJC□...-07	DCET0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
SDJC□...-11	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	

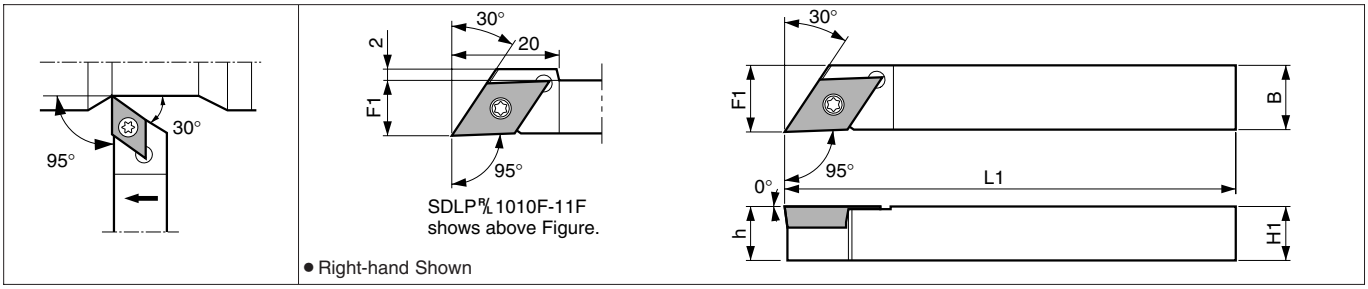
●: Std. Stock ○: Check Availability

Toolholders for General Purpose [DC□□, DP□□ Insert] Screw Clamp

■ SDXC (External/Facing/Copying)



■ SDLP-F (External/Copying)



● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	F1	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
SDXCR/L	1010F-07	○		○	10	10	80	12.0	0.2	SB-2570TR	FT-8
	1010F-11	○		○	10	10	80	12.0			
	1212H-11	○		○	12	12	100	16.0	0.2	SB-4085TR	FT-15
	1616H-11	●		○	16	16	100	20.0			
SDLPR/L	0808F-07F	○		○	8	8	80	8.5	0.2	SB-2570TR	FT-8
	1010F-07F	○		○	10	10	80	10.5			
	1010F-11F	○		○	10	10	80	10.5	0.2	SB-4085TR	FT-15
	1212H-11F	○		○	12	12	100	12.5			
	1616H-11F	○		○	16	16	100	16.5			

● Applicable Insert (SDXC)

Application	Minute ap	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed
Ref. Page	69	69	69	70	70	70	70	70	71	71	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	R/L-F	R/L-FSF	R/L-FS	(E/F)N-Z	(E/F)R/L-U
SDXCR/L...-07	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCCT0702..	DCGT0702..	DCGT0702..	DCGT0702..
SDXCR/L...-11	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCCT11T3..	DCGT11T3..	DCGT11T3..	DCGT11T3..

Application	Low Feed/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l	
Ref. Page	71	71	71	70	70	72	70	72	462	448, 449	
Shape / Toolholder	FR/L-USF	(E/F)R/L-J	FR/L-JSF	XP	XQ	No Chipbreaker	AH	R/L-A3	Diamond	CBN	
SDXCR/L...-07	DCCT0702..	-	-	DCMT0702..	-	DCGW0702..	-	DCGT0702..	DCMT0702..	DCMW0702..	
SDXCR/L...-11	DCCT11T3..	DCGT11T3..	DCCT11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..	DCMW11T3..	

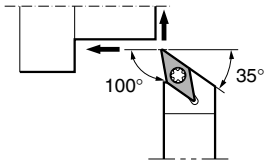
● Applicable Insert (SDLP-F)

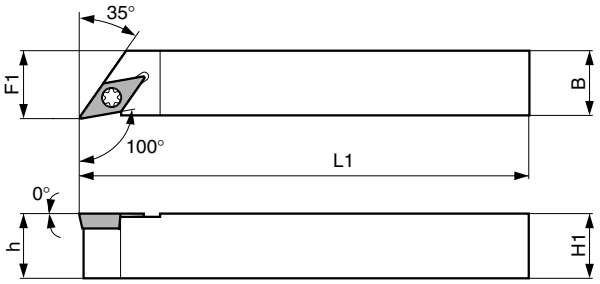
Application	Finishing/Precision	Low Feed/Precision
Ref. Page	70	71
Shape / Toolholder	R/L-FSF	FR/L-USF
SDLPR/L...-07F	DPET0702..	DPET0702..
SDLPR/L...-11F	DPET11T3..	DPET11T3..

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [YP□□ Insert] Screw Clamp

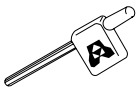
■ SYXP-F (External/Facing/Copying)





● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
												Clamp Screw	Wrench			
	R	N	L	H1=h	B	L1	F1									
SYXP R/L 0808F -06F	○		○	8	8	80	8.5				0.2	**SB-2050TR**	**FT-6**			
1010H -06F	○		○	10	10	100	10.5									

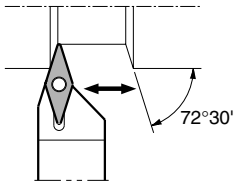
● Applicable Insert

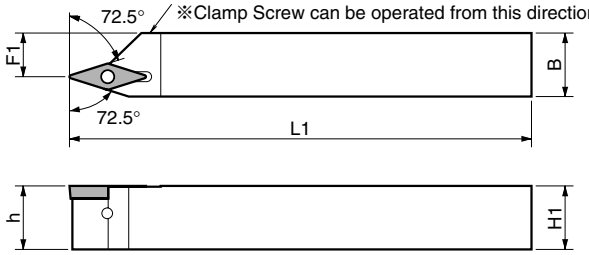
Application	Finishing	Low Feed									
Ref. Page	68	68									
Shape / Toolholder	R/L-F	F R/L-U									
											
SYXP R/L...-06F	YPGT0602..	YPGT0602..									

Toolholders for General Purpose [VB/VC□□ Insert]

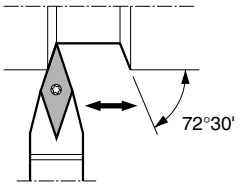
Back Clamp/
Screw Clamp

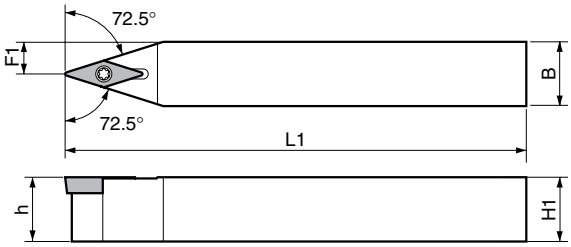
■ AVVB-F (External/Copying)





■ SVVB (External/Copying)





● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	B	L1	F1	Std. Corner-R	Spare Parts: Anchor Pin	Lock Screw	Clamp Screw	Wrench	Shim	Shim Screw	Wrench
AVVB R/L	1010K-11F	●		○	10	10	125	5	0.4	LPF-11	HSB4X8 R/L	-	FH-2	-	-	-
	1212M-11F	●		●	12	12	150	7		LPF-1113						
	1616M-11F	●		○	16	16	150	11		LPF-1117						
SVVBN	1010F-11		●		10	10	80	5	0.4	-	-	SB-2570TR	FT-8	-	-	-
	1212H-11		●		12	12	100	6								
	1616H-11		●		16	16	100	8								
	2020K-11		●		20	20	125	10								
	2525M-11		●		25	25	150	12.5								
	2020K-16		●		20	20	125	10	0.8	-	-	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
	2525M-16		●		25	25	150	12.5								

● Lock Screw : HSB4×8R for R-hand Toolholder, HSB4×8L for L-hand Toolholder

● Applicable Insert

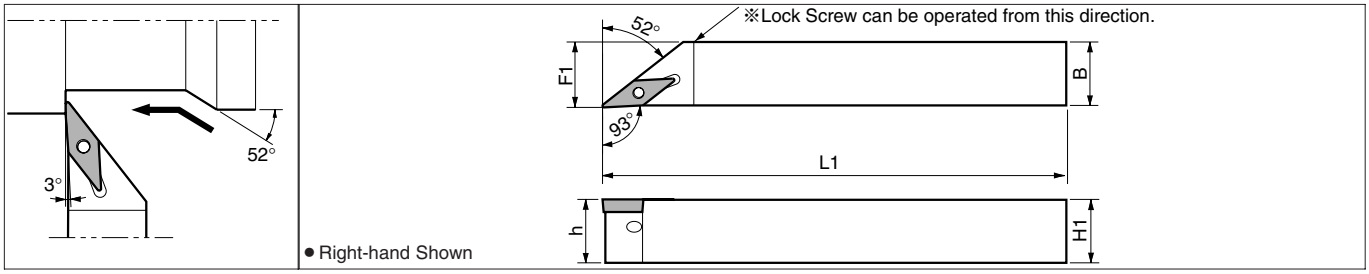
Application	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Ref. Page	73	73	74	74	74	74	73	73	74	462	449
Shape / Toolholder	GP	HQ	R/L-F	R/L-FSF	R/L-Y	(E/F)N-Z	AH	No Indication	R/L-A3	Diamond	CBN
AVVB R/L...-11F	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-	-	-	VBMT1103..	VBGW1103..
SVVBN ...-11	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-	-	-	VBMT1103..	VBGW1103..
SVVBN ...-16	VBMT1604..	VBMT1604.. VCMT1604..	-	-	VBGT1604.. VCGT1604..	-	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604.. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..

●: Std. Stock ○: Check Availability

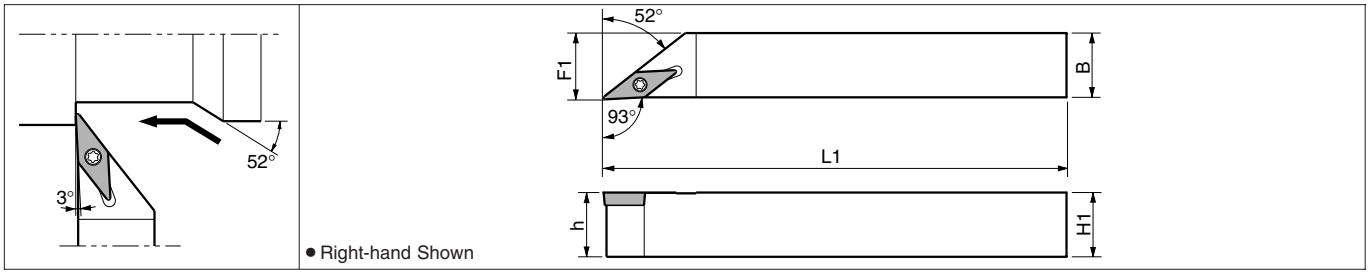
Toolholders for General Purpose [VB/VC□□ Insert]

Back Clamp/
Screw Clamp

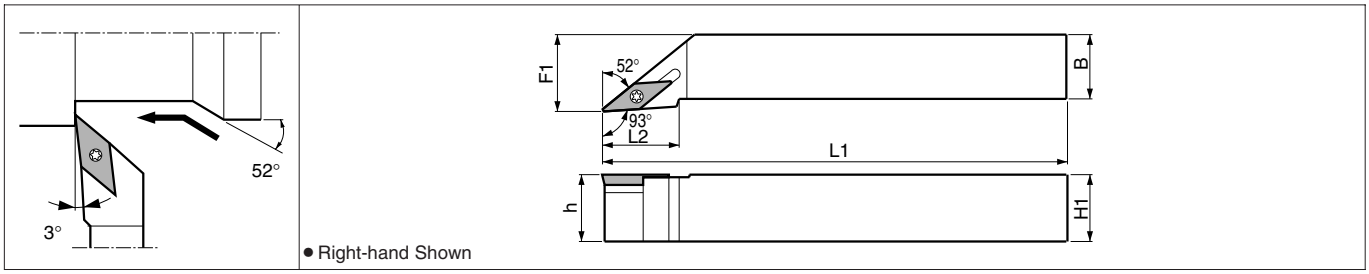
■ AVJB-F (External/Copying)



■ SVJB-F (External/Copying)



■ SVJB (External/Copying)



● Toolholder Dimension

Description		Stock			Dimension (mm)					Std. Corner-R	Spare Parts						
		R	N	L	H1=h	B	L1	L2	F1		Anchor Pin	Lock Screw	Clamp Screw	Wrench	Shim	Shim Screw	Wrench
AVJB R/L	1010K-11F	●		●	10	10	125	-	10.5		LPF-11						
	1212M-11F	●		●	12	12	150	-	12.5	0.4	LPF-1113	HSB4X8 R/L	-	FH-2	-	-	-
	1616M-11F	●		●	16	16	150	-	16.5		LPF-1117						
SVJB R/L	1010F-11F	●		●	10	10	80	-	10.5								
	1212H-11F	●		●	12	12	100	-	12.5	0.4	-	-	SB-2570TR	FT-8	-	-	-
	1616H-11F	●		●	16	16	100	-	16.5								
SVJB R/L	2020K-11	●		●	20	20	125	30	25	0.4			SB-2570TR	FT-8	-	-	-
	2525M-11	●		●	25	25	150	35	32		-	-					
	2020K-16	●		●	20	20	125	30	25	0.8			SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
	2525M-16	●		●	25	25	150	30	32								

● Lock Screw: HSB4×8R for R-hand Toolholder, HSB4×8L for L-hand Toolholder

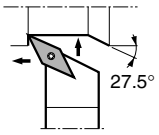
● Applicable Insert

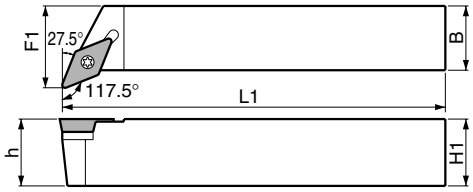
Application	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Ref. Page	73	73	74	74	74	74	73	73	74	462	449
Shape / Toolholder	GP	HQ	R/L-F	R/L-FSF	R/L-Y	(E/F)N-Z	AH	No Indication	R/L-A3	Diamond	CBN
AVJB R/L...-11F	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-		-	VBMT1103..	VBGW1103..
SVJB R/L...-11F	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-		-	VBMT1103..	VBGW1103..
SVJB R/L...-11	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-		-	VBMT1103..	VBGW1103..
SVJB R/L...-16	VBMT1604..	VBMT1604.. VCMT1604..	-	-	VBGT1604.. VCGT1604..	-	VCGT1604..		VCGT1604..	VBMT1604.. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [VB/VC□□, VP□□ Insert] Screw Clamp

■ SVPB (External/Facing/Copying/Reliefing)





● Right-hand Shown

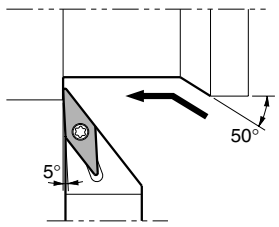
● Toolholder Dimension

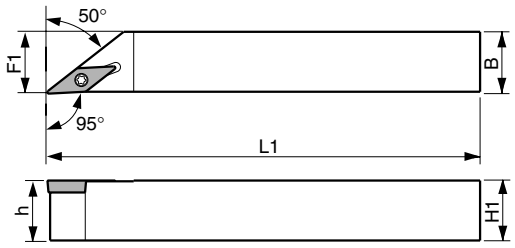
Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	F1	Std. Corner-R	Spare Parts: Clamp Screw	Wrench	Shim	Shim Screw	Wrench
SVPB R/L	1010F-11	●		○	10	10	80	14.5	0.4	SB-2570TR	FT-8	-	-	-
	1212H-11	●		○	12	12	100	16.5						
	1616H-11	●		○	16	16	100	20.5						
	2020K-11	●		●	20	20	125	25						
	2525M-11	●		●	25	25	150	32						
	2020K-16	●		●	20	20	125	25	0.8	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
	2525M-16	●		○	25	25	150	32						

● Applicable Insert

Application	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Finishing-Medium	Medium	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Ref. Page	73	73	74	74	74	74	73	73	74	462	449
Shape / Toolholder	GP	HQ	R/L-F	R/L-FSF	R/L-Y	(E/F)N-Z	AH	No Indication	R/L-A3	Diamond	CBN
SVPB R/L...-11	VBMT1103..	VBMT1103.. VCMT1103..	VBGT1103..	VBET1103..	VBGT1103.. VCGT1103..	VBGT1103.. VCGT1103..	-	-	-	VBMT1103..	VBGW1103..
SVPB R/L...-16	VBMT1604..	VBMT1604.. VCMT1604..	-	-	VBGT1604.. VCGT1604..	-	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604.. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..

■ SVLP-F (External/Copying)





● Toolholder Dimension

Description		Stock R	N	L	Dimension (mm) H1=h	B	L1	F1	Std. Corner-R	Spare Parts: Clamp Screw	Wrench
SVLP R/L	1010F-11F	●		●	10	10	80	10.5	0.2	SB-2570TR	FT-8
	1212H-11F	●		●	12	12	100	12.5			
	1616H-11F	●		●	16	16	100	16.5			

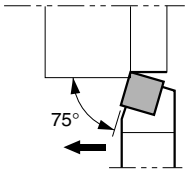
● Applicable Insert

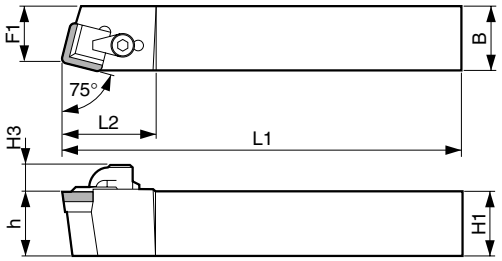
Application	Minute ap	Finishing/Precision	Low Feed	Low Feed/Precision
Ref. Page	73	74	74	74
Shape / Toolholder	CF	R/L-FSF	FR/L-U	FR/L-USF
SVLP R/L...-11F	VPGT1103..	VPET1103..	VPGT1103..	VPET1103..

●: Std. Stock ○: Check Availability

Toolholders for General Purpose [SP□□ Insert] Top Clamp

■ CSBP (External)

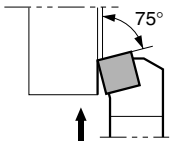


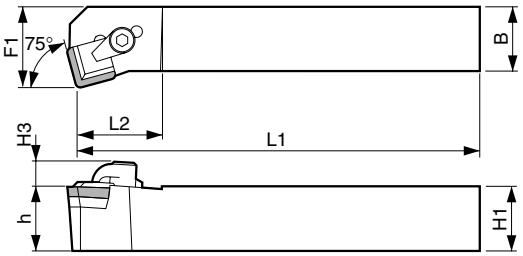


Side Rake Angle : +6°
Angle of Inclination : 0°

● Right-hand Shown

■ CSKP (Facing)





Side Rake Angle : +6°
Angle of Inclination : 0°

● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
	R	N	L	H1=h	H3	B	L1	L2	F1			Clamp Set	Wrench	Chipbreaker	Shim	Shim Screw
CSBP R/L 1212F-09N	○		○	12	7.5	12	80	21	13		0.4	CPS-2P	LW-2.5	CB-S3220	-	-
CSKP R/L 1616H-09N	○			16	7.5	16	100	21	20		0.4	CPS-2P	LW-2.5	CB-S3220	-	-
2020K-12N	○			20	8.5	20	125	28	25		0.8	CPS-3	LW-3	CB-S4220	KPS-42	SP3X8
2525M-12N	○			25	8.5	25	150	28	32							

● Chipbreaker is not attached. Prepare separately.

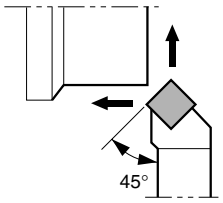
● Applicable Insert

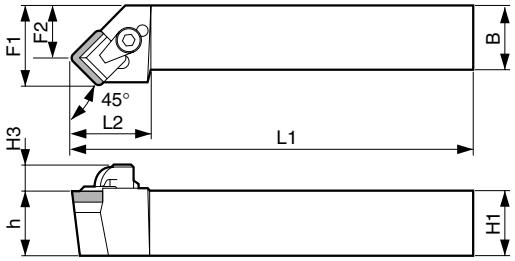
Application	Medium	Medium	Finishing-Medium	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l				
Ref. Page	76	76	76	76	86	462	449				
Shape / Toolholder	G	Conventional	R/L	No Chipbreaker	Ceramic	Diamond	CBN				
CSBP R/L...-09N	SPMR0903..	SPMR0903..	SPGR0903..	SPMN0903.. SPGN0903..	SPGN0903..	-	SPGN0903..				
CSKP R/L...-09N	SPMR0903..	SPMR0903..	SPGR0903..	SPMN0903.. SPGN0903..	SPGN0903..	-	SPGN0903..				
CSKP R/L...-12N	SPMR1203..	SPMR1203..	SPGR1203..	SPMN1203.. SPGN1203..	SPGN1203..	SPGN1203..	SPGN1204..				

● CSKP R/L : L-hand Insert for R-hand Toolholder.

Toolholders for General Purpose [SP□□ Insert] Top Clamp

■ CSSP (External/Facing/Chamfering)

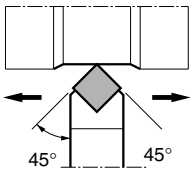


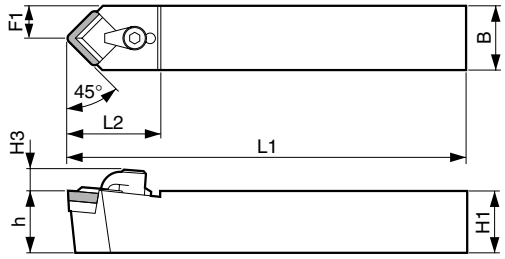


Side Rake Angle : -09 Type +5°
: -12 Type +6°
Angle of Inclination : 0°

● Right-hand Shown

■ CSDP (External/Chamfering)





Side Rake Angle : +4°15'
Angle of Inclination : +4°15'

● Toolholder Dimension

Description		Stock			Dimension (mm)							Std. Corner-R	Spare Parts				
		R	N	L	H1=h	H3	B	L1	L2	F1	F2		Clamp Set	Wrench	Chipbreaker	Shim	Shim Screw
CSSP R/L	1212F-09N	○		○	12	7.5	12	80	15	16	9	0.4	CPS-2P	LW-2.5	CB-S3220	-	-
	1616H-09N	○		○	16	7.5	16	100	16	20	13						
	2020K-12N	○		○	20	8.5	20	125	19	25	16	0.8	CPS-3	LW-3	CB-S4220	KPS-42	SP3X8
	2525M-12N	●		○	25	8.5	25	150	19	32	23						
CSDPN	2020K-12N		○		20	8.5	20	125	32	10	-	0.8	CPS-3	LW-3	CB-S4220	KPS-42	SP3X8
	2525M-12N		●		25	8.5	25	150	32	12.5	-						

● Chipbreaker is not attached. Prepare separately.

● Applicable Insert

Application	Medium	Medium	Finishing-Medium	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	76	76	76	76	86	462	449
Shape / Toolholder	G	Conventional	R/L	No Chipbreaker	Ceramic	Diamond	CBN
CSSP R/L...-09N	SPMR0903..	SPMR0903..	SPGR0903..	SPMN0903.. SPGN0903..	SPGN0903..	-	SPGN0903..
CSSP R/L...-12N	SPMR1203..	SPMR1203..	SPGR1203..	SPMN1203.. SPGN1203..	SPGN1203..	SPGN1203..	SPGN1204..
CSDPN...-12N	SPMR1203..	SPMR1203..	SPGR1203..	SPMN1203.. SPGN1203..	SPGN1203..	SPGN1203..	SPGN1204..

● CSSP R/L : At External Turning, R-hand Insert for R-hand Toolholder and L-hand Insert for L-hand Toolholder.
At Facing, L-hand Insert for R-hand Toolholder and R-hand Insert for L-hand Toolholder.

●: Std. Stock ○: Check Availability

Recommended Cutting Conditions

Cutting Dia. : under 16mm

■ Recommended Cutting Conditions - External Turning (Positive Insert)

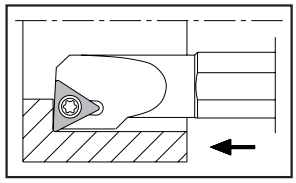
ISO Classfication	Work Material (Hardness)		Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner -R	Lower Limit - Recommendation - Upper Limit		
								V_C (m/min)	a_p (mm)	f (mm/rev)
P	**Low-carbon Steel Low-carbon Alloy** S10C,SCM415 SS400,SCr415 STKM,SP etc.		Precision Finishing	Continous Interrupted	FSF	PR930 PR930	0.03 0.2	80- 100 -120 60- 80 -100	0.05- 0.07 -0.15 0.05- 0.1 -0.2	0.03- 0.05 -0.1 0.03- 0.1 -0.15
			Precision Finishing (Molded Chipbreaker)	Continous	CF	PR930	0.2	80- 100 -120	0.02- 0.05 -0.1	0.02- 0.05 -0.12
			Finishing	Continous Interrupted	XP	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.2 - 0.5 -1.0 0.2 - 0.5 -1.0	0.05- 0.1 -0.2 0.05- 0.1 -0.2
			Finishing-Medium	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.5 - 1.0 -2.0 0.5 - 1.0 -1.5	0.1 - 0.15 -0.25 0.1 - 0.15 -0.2
			Low Feed & Large a_p	Continous	J,U	PR930	0.2	60- 80 -100	0.5 - 2.0 -3.5	0.02- 0.05 -0.1
			Back Turning	Continous	(ABW) (ABS)	PR930	0.15	60- 80 -100	0.5 - 2.0 -4.0	0.02- 0.04 -0.07
	Medium-carbon Steel Medium-carbon Alloy S45C SCM435 etc.		Precision Finishing	Continous Interrupted	FSF	PR930 PR930	0.03 0.2	80- 100 -120 60- 80 -100	0.05- 0.07 -0.15 0.05- 0.1 -0.2	0.03- 0.05 -0.1 0.03- 0.1 -0.15
			Precision Finishing (Molded Chipbreaker)	Continous	CF	PR930	0.2	80- 100 -120	0.02- 0.05 -0.1	0.02- 0.05 -0.12
			Finishing	Continous Interrupted	XP	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.2 - 0.5 -1.0 0.2 - 0.5 -1.0	0.05- 0.1 -0.2 0.05- 0.1 -0.2
			Finishing-Medium	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.5 - 1.0 -2.0 0.5 - 1.0 -1.5	0.1 - 0.15 -0.25 0.1 - 0.15 -0.2
			Low Feed & Large a_p	Continous	J,U	PR930	0.2	60- 80 -100	0.5 - 2.0 -3.5	0.02- 0.05 -0.1
			Back Turning	Continous	(ABW) (ABS)	PR930	0.15	60- 80 -100	0.5 - 2.0 -4.0	0.02- 0.04 -0.07
	High-carbon Alloy SKD11 SKD61 etc.		Precision Finishing	Continous Interrupted	FSF	PR930 PR930	0.03 0.2	80- 100 -120 60- 80 -100	0.05- 0.07 -0.15 0.05- 0.1 -0.2	0.03- 0.05 -0.1 0.03- 0.1 -0.15
			Precision Finishing (Molded Chipbreaker)	Continous	CF	PR930	0.2	80- 100 -120	0.02- 0.05 -0.1	0.02- 0.05 -0.12
			Finishing	Continous Interrupted	XP	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.2 - 0.5 -1.0 0.2 - 0.5 -1.0	0.05- 0.1 -0.2 0.05- 0.1 -0.2
			Finishing-Medium	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.5 - 1.0 -2.0 0.5 - 1.0 -1.5	0.1 - 0.15 -0.25 0.1 - 0.15 -0.2
			Low Feed & Large a_p	Continous	J,U	PR930	0.2	60- 80 -100	0.5 - 2.0 -3.5	0.02- 0.05 -0.1
			Back Turning	Continous	(ABW) (ABS)	PR930	0.15	60- 80 -100	0.5 - 2.0 -4.0	0.02- 0.04 -0.07
M	**Stainless Steel** SUS303,SUS304 SUS316,SUS420J2 etc.		Finishing	Continous Interrupted	F GP	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.05- 0.07 -0.15 0.05- 0.1 -0.2	0.03- 0.05 -0.1 0.03- 0.1 -0.15
			Medium	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	80- 100 -120 60- 80 -100	0.5 - 1.0 -2.0 0.5 - 1.0 -1.5	0.07- 0.12 -0.15 0.05- 0.1 -0.15
	Stainless Steel SUS630 etc.		Finishing	Continous Interrupted	F GP	PR930 PR930	0.2 0.4	40- 60 - 80 30- 50 - 70	0.05- 0.07 -0.15 0.05- 0.1 -0.2	0.03- 0.05 -0.1 0.03- 0.1 -0.15
			Medium	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	40- 60 - 80 30- 50 - 70	0.5 - 1.0 -2.0 0.5 - 1.0 -1.5	0.07- 0.12 -0.15 0.05- 0.1 -0.15
K	**Cast Iron** FC200, FC250 FC300 etc.		Finishing	Continous Interrupted	HQ	CR7015 CR7015	0.2 0.4	100- 120 -150 80- 100 -120	0.2 - 0.5 -1.0 0.2 - 0.5 -1.0	0.1 - 0.15 -0.2 0.05- 0.1 -0.15
			Medium	Continous Interrupted	Without Indication	CR7015 CR7015	0.4 0.8	100- 120 -150 80- 100 -120	0.5 - 1.0 -2.0 0.5 - 1.0 -2.0	0.1 - 0.15 -0.2 0.05- 0.1 -0.15
	Ductile Cast Iron FCD450, FCD600 etc.		Finishing	Continous Interrupted	HQ	CR7015 CR7015	0.2 0.4	80- 100 -120 60- 80 -100	0.2 - 0.5 -1.0 0.2 - 0.5 -1.0	0.1 - 0.15 -0.2 0.05- 0.1 -0.15
			Medium	Continous Interrupted	Without Indication	CR7015 CR7015	0.4 0.8	80- 100 -120 60- 80 -100	0.5 - 1.0 -2.0 0.5 - 1.0 -2.0	0.1 - 0.15 -0.2 0.05- 0.1 -0.15
N	**Non-Ferrous Metal Copper Alloy Aluminum Alloy** (Si: under 10%) etc.		Finishing (High Speed) (Rainbow-colored Gloss)	Continous	Without Chipbreaker	KPD010	0.2	150- 250 -350	0.05- 0.1 -0.3	0.05- 0.1 -0.15
			Finishing	Continous Interrupted	F,FSF	KW10 KW10	0.2 0.4	100- 150 -200 100- 150 -200	0.05- 0.3 -0.5 0.05- 0.3 -0.5	0.02- 0.07 -0.1 0.02- 0.07 -0.1
			Medium	Continous Interrupted	U,USF	KW10 KW10	0.2 0.4	100- 150 -200 100- 150 -200	0.2 - 0.5 -1.5 0.2 - 0.5 -1.5	0.03- 0.1 -0.2 0.03- 0.1 -0.2
S	**Titanium Alloy** Ti-6Al-4V etc.		Finishing (High Speed) (Rainbow-colored Gloss)	Continous Interrupted	Without Chipbreaker	KPD010 KPD010	0.2 0.4	100- 120 -150 70- 100 -120	0.05- 0.1 -0.3 0.05- 0.1 -0.3	0.03- 0.07 -0.1 0.03- 0.07 -0.1
			Medium	Continous Interrupted	FSF,USF	KW10 KW10	0.4 0.4	10- 30 - 50 10- 30 - 50	0.05- 0.5 -1.0 0.05- 0.5 -1.0	0.03- 0.1 -0.2 0.03- 0.1 -0.2
	High-temperature Alloy incones 625, incones 718 etc.		Finishing	Continous Interrupted	F,U Without Chipbreaker	KW10 KW10	0.4 0.8	10- 30 - 50 10- 30 - 50	0.1 - 0.3 -0.5 0.2 - 0.5 -0.7	0.03- 0.05 -0.1 0.03- 0.05 -0.1
			Finishing	Continous Interrupted	HQ	CA6015 CA6015	0.4 0.8	40- 60 - 80 40- 60 - 80	0.1 - 0.3 -0.5 0.1 - 0.3 -0.5	0.03- 0.05 -0.1 0.03- 0.05 -0.1
H	**Heat Treated Steel High Hard Mat'l** SKD11, SKD61 etc.	40~50 HRC	Finishing	Continous Interrupted	HQ	PR930 PR930	0.2 0.4	40- 60 - 80 40- 60 - 80	0.1 - 0.3 -0.5 0.1 - 0.3 -0.5	0.02- 0.07 -0.1 0.02- 0.07 -0.1
		50~68 HRC	Finishing	Continous Interrupted	SE SE-T,ME-T	KBN25B KBN25B	0.2 0.4	80- 120 -150 60- 100 -120	0.1 - 0.3 -0.5 0.1 - 0.3 -0.5	0.02- 0.07 -0.1 0.02- 0.07 -0.1

Boring

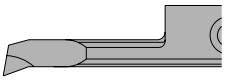
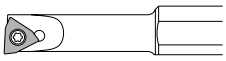
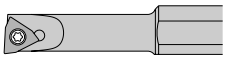
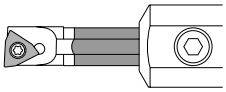
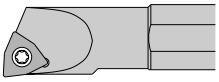
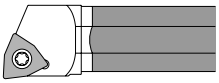
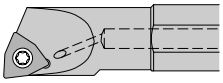
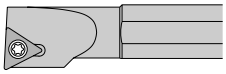
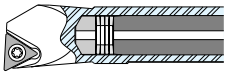
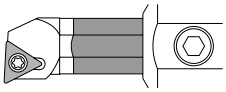
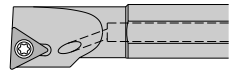
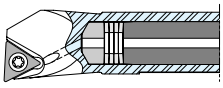
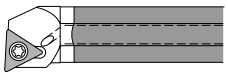
147～202

Product Lineup

■ Boring Bars for General Purpose

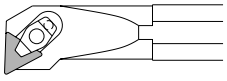
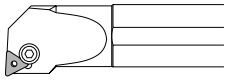
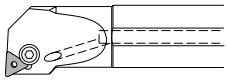
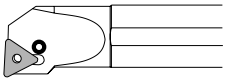


Blind Hole Boring

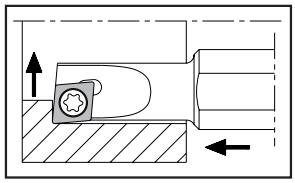
Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Blind Hole Boring	VNB (System Tip-Bar) P.154		Solid		○	Solid	●	●	●	●	●	●												
	PSB (Tip-Bar) P.158		Solid L/D=～5		○	Solid	●	●	●	●	●	●												
	S···SWUB P.167		Steel L/D=～3		○	Positive					●	●	●											
	S···SWUB-E P.167		Excellent L/D=～5		○	Positive					●	●	●											
	C···SWUB P.167		Carbide L/D=～7		○	Positive					●	●	●											
	C···SWUB-AS P.168		Carbide L/D=～7		○	Positive					●	●	●											
	S···SWUP(B)-E P.169		Excellent L/D=～5		○	Positive								●	●	●	●	●	●	●				
	C···SWUP(B) P.169		Carbide L/D=～7		○	Positive								●	●	●	●	●	●	●				
	A···SWUP-E P.170		Excellent L/D=～5	●		Positive										●	●	●	●	●				
	S···STUP(B) P.172		Steel L/D=～3		○	Positive							●	●	●		●		●	●		●		
	S···STUP(B)-E P.172		Excellent L/D=～5		○	Positive							●	●	●	●	●	●	●	●		●		
	K···STUP P.172		Strong L/D=～6		○	Positive									●	●	●	●	●	●		●		
	C···STUP(B) P.172		Carbide L/D=～7		○	Positive							●	●	●	●	●	●	●	●				
	C···STUP-AS P.175		Carbide L/D=～7		○	Positive								●	●	●	●	●	●	●				
	A···STUP-E P.176		Excellent L/D=～5	●		Positive								●	●	●	●	●	●	●		●		
	K···STUP-H P.176		Strong L/D=～6	●		Positive									●	●	●	●	●	●		●		
	E···STUP P.176		Carbide L/D=～7	●		Positive								●	●	●	●	●	●	●				

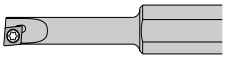
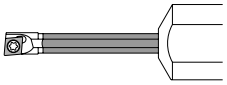
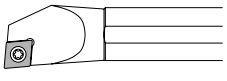
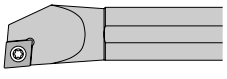
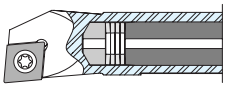
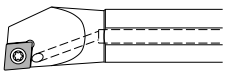
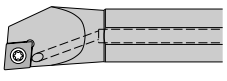
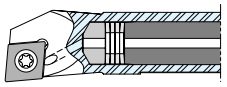
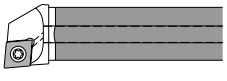
Min. Bore Dia. ϕA becomes the figure under ● depending on Boring Bar type.

■ Boring Bars for General Purpose

Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Blind Hole Boring	S···CTUP P.179		Steel L/D=~3		○	Positive													●	● 27		● 34	● 43	●
	S···PTUN11 P.193		Steel L/D=~3		○	Negative													●	●		●		
	A···PTUN11 P.193		Steel L/D=~3	●		Negative													●	●		●		
	S···PTUN16 P.194		Steel L/D=~3		○	Negative															●		●	●

Boring/Facing

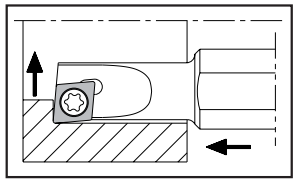


Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Boring / Internal Facing	S···SCLC-E P.160		Excellent L/D=~5		○	Positive				●	●	●	●											
	C···SCLC P.160		Carbide L/D=~7		○	Positive				●	●	●	●											
	C···SCLC-AS P.161		Carbide L/D=~7		○	Positive				●	●	●	●											
	S···SCLP(C) P.162		Steel L/D=~3		○	Positive								●	●	●	●	●	●	●	●			
	S···SCLP(C)-E P.162		Excellent L/D=~5		○	Positive								●	●	●	●	●	●	●				
	K···SCLP P.162		Strong L/D=~6		○	Positive									●	●	●	●	●	●	●			
	C···SCLP(C) P.162		Carbide L/D=~7		○	Positive								●	●		●		●	●				
	A···SCLC P.164		Steel L/D=~3	●		Positive								●	●	●	●		●	●				
	A···SCLP(C)-E P.164		Excellent L/D=~5	●		Positive								●	●	●	●	●	●	●				
	K···SCLC-H P.164		Strong L/D=~6	●		Positive									●	●	●	●	●	●	●			
	E···SCLP(C) P.164		Carbide L/D=~7	●		Positive								●	●		●		●	●				

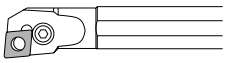
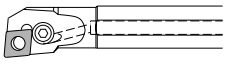
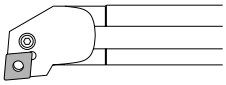
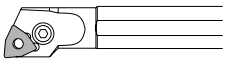
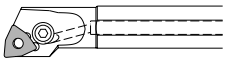
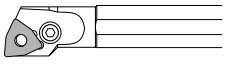
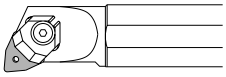
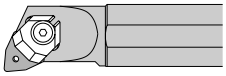
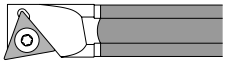
Min. Bore Dia. ϕA becomes the figure under ● depending on Boring Bar type.

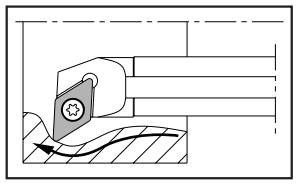
Product Lineup

■ Boring Bars for General Purpose

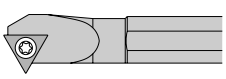
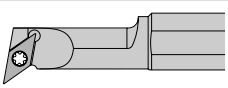


Boring/Facing

Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Boring / Internal Facing	S···PCLN09 P.188		Steel L/D=~3		○	Negative													●	● 27		●		
	A···PCLN09 P.188		Steel L/D=~3	●		Negative													●	● 27		●		
	S···PCLN12 P.189		Steel L/D=~3		○	Negative																	●	●
	S···PWLN06 P.190		Steel L/D=~3		○	Negative													●	● 27		●		
	A···PWLN06 P.190		Steel L/D=~3	●		Negative													●	● 27		●		
	S···PWLN08 P.191		Steel L/D=~3		○	Negative																	●	●
	S···WWLN08 P.192		Steel L/D=~3		○	Negative																● 34	●	
	S···WWLN08-E P.192		Excellent L/D=~5		○	Negative														● 28		● 34	●	
	C···STXP(B) P.171		Carbide L/D=~7		○	Positive						● 7.5	● 9	● 11										
	C···SJLC P.180		Carbide L/D=~7		○	Positive				● 5.5														

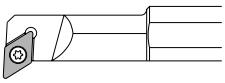
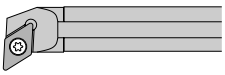
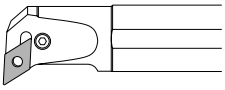
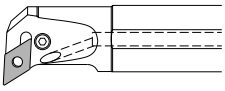
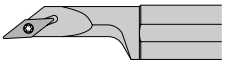
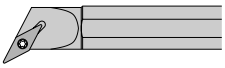
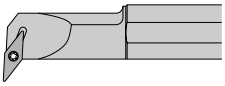


Copying

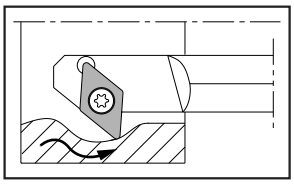
Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Copying	S···STWP P.178		Steel L/D=~3		○	Positive									●		●		●	●				
	S···STWP-E P.178		Excellent L/D=~5		○	Positive									●		●		●	●		●		
	S···SYXP-E P.181		Excellent L/D=~5		○	Positive									●		●							

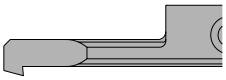
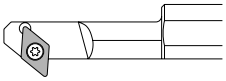
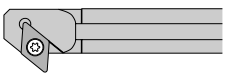
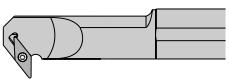
Min. Bore Dia. ϕA becomes the figure under ● depending on Boring Bar type.

■ Boring Bars for General Purpose

Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Copying	S···SDUC P.182		Steel L/D=~3		○	Positive										●	●		●	●				
	S···SDUC-E P.182		Excellent L/D=~5		○	Positive										●	●		●	●		●		
	C···SDUC P.182		Carbide L/D=~7		○	Positive										●	●		●	●		●		
	S···PDUN11 P.195		Steel L/D=~3		○	Negative														● 27		●	●	
	A···PDUN11 P.195		Steel L/D=~3	●		Negative														● 27		●	●	
	S···SVJB(C)-E S···SVJP-E P.184		Excellent L/D=~5		○	Positive											● ●		●	●	●		●	●
	S···SVPB(C)-E P.184		Excellent L/D=~5		○	Positive											●		●	●		● 34	●	
	S···SVUB(C)-E P.184		Excellent L/D=~5		○	Positive											●		●	●		● 34	●	

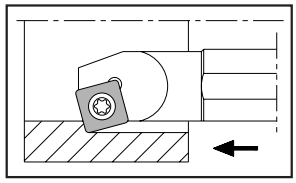
Back Copying



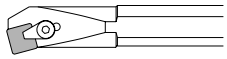
Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Back Copying	VNBT (System Tip-Bar) P.154		Solid		○	Solid			●	●														
	PSBT (Tip-Bar) P.158		Solid L/D=~5		○	Solid			●	●														
	C···STZB P.171		Carbide L/D=~7		○	Positive							● 8.5											
	C···SJZC P.180		Carbide L/D=~7		○	Positive					● 6.5													
	S···SDZC P.182		Steel L/D=~3		○	Positive										●	●		●	●				
	S···SDZC-E P.182		Excellent L/D=~5		○	Positive										●	●		●	●		●		
	S···SVZB(C)-E P.184		Excellent L/D=~5		○	Positive											●		●	●		● 34	●	

Min. Bore Dia. ϕA becomes the figure under ● depending on Boring Bar type.

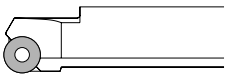
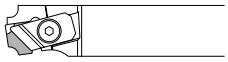
■ Boring Bars for General Purpose



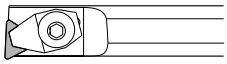
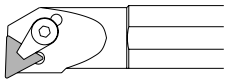
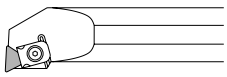
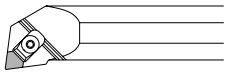
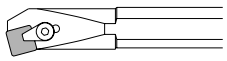
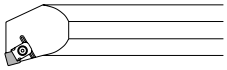
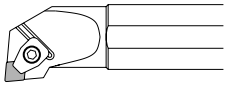
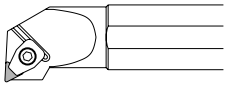
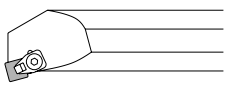
Thru Boring

Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Thru Boring	S···SSKP P.187		Steel L/D=～3		○	Positive													●	●		●	●	
	S···CSKP P.187		Steel L/D=～3		○	Positive													●	● 27		● 34	● 43	

■ Toolholders for Bearing Machining (Square Shank)

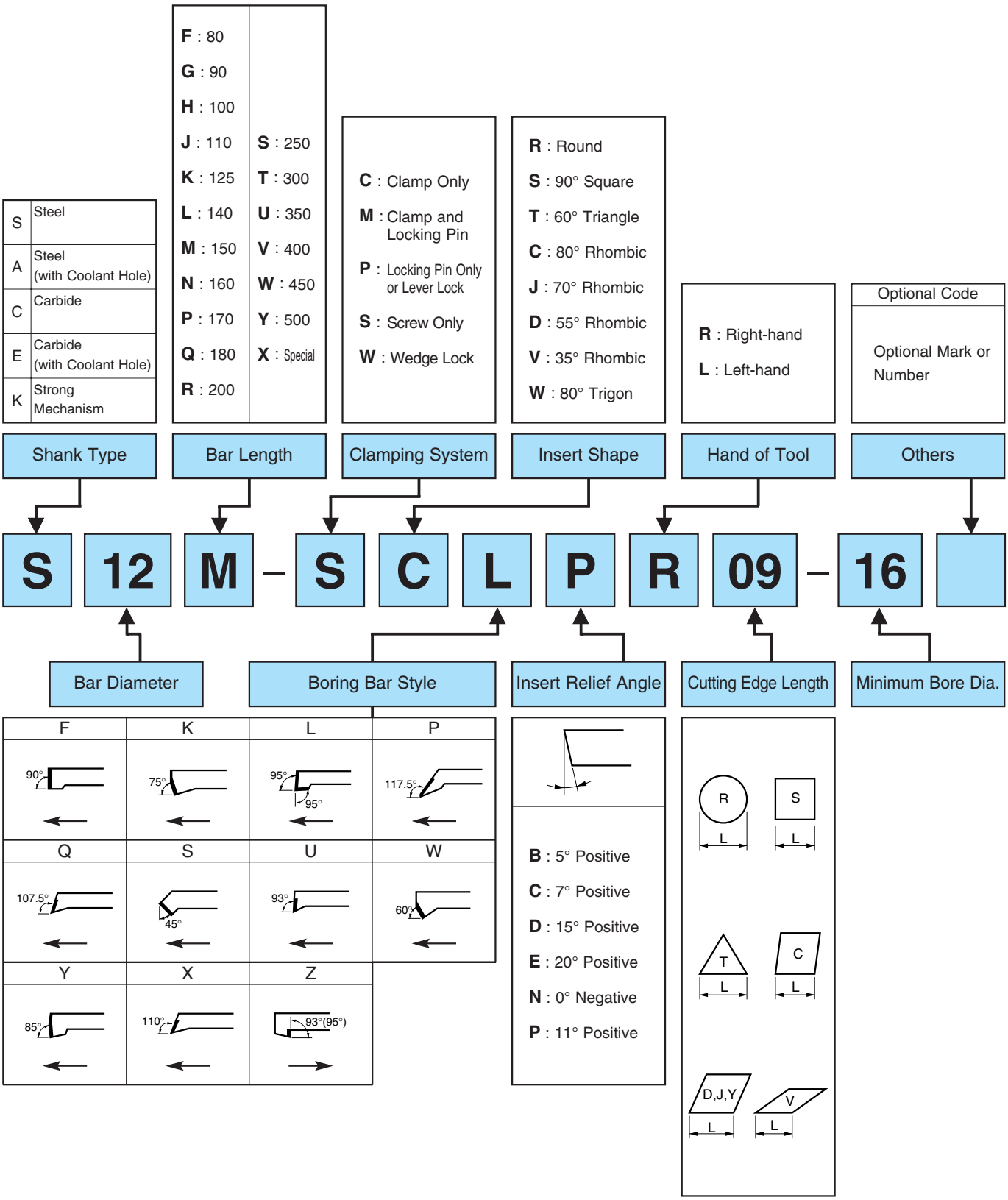
Application	Toolholder Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Thru Boring	SRCP-B P.196		Steel		○	Positive													●			●		
Round-Chamfering	CBSN-B P.196		Steel		○	Negative													●					

■ Boring Bars for Ceramic / Solid CBN Tools

Application	Boring Bar Type	Shape	Shank Type Max. Overhang Length (L/D)	Coolant Hole Yes	Coolant Hole No	Insert Type	Min. Bore Dia. ϕA 2	3	4	5	6	7	8	10	12	14	16	18	20	25	30	32	40	50
Blind Hole Boring	S···CTXB-HM P.197		Special L/D=～6		○	Positive								●		● 15								
	S···CTUP P.179		Steel L/D=～3		○	Positive											●		●	● 27		● 34	● 43	●
	S···CTUC P.197		Steel L/D=～3		○	Positive																	●	
Boring / Facing	S···CELN P.198		Steel L/D=～3		○	Negative																		●
Thru Boring	S···CSKP P.187		Steel L/D=～3		○	Positive													●	● 27		● 34	● 43	
	S···CSKN P.198		Steel L/D=～3		○	Negative																		●
Boring / Facing	S···CCLN-A P.456		Steel L/D=～3		○	Negative															●		●	
Blind Hole Boring	S···CTUN-A P.457		Steel L/D=～3		○	Negative															●			
Thru Boring	S···CSKN-A P.457		Steel L/D=～3		○	Negative															●		●	

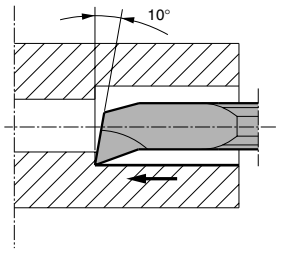
Min. Bore Dia. ϕA becomes the figure under ● depending on Boring Bar type.

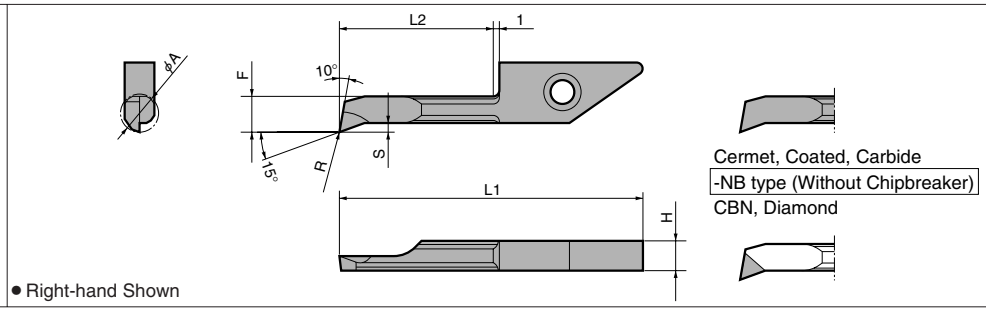
Boring Bars Identification System (Round Shank)



System Tip-Bar for Micro Boring

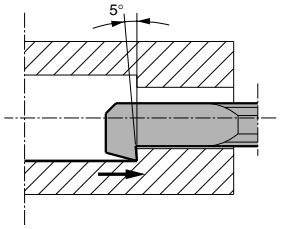
■ VNB (Blind Hole Boring)

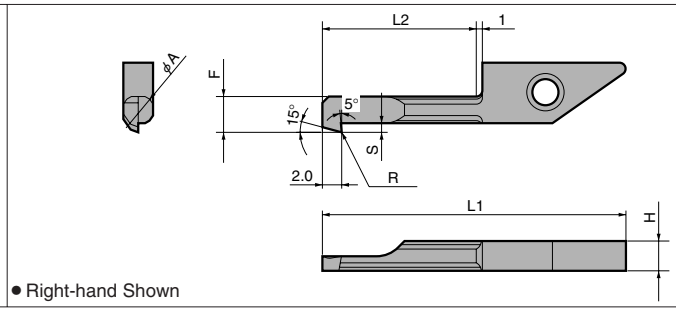




● Right-hand Shown

■ VNBT (Back Boring)





● Right-hand Shown

● Insert Dimension

Description		Min. Bore Dia.	Dimension (mm)						Insert Grade						
									Cermet	PVD Coated			Carbide	Diamond	
		φA	H	L1	L2	F	S	R	TC60	PR630	PR915	PR930	KW10	KPD010	KPD001
VNB R/L	0206-003	2	3.9	26.5	6	1.8	0.25	0.03				R	R		
	0311-003	3	3.9	30.8	11	2.6	0.4					R	R		
	0411-003	4	3.9	30.8	11	3.5	0.5		R	R		●	R		
	0420-003			39.8	20				R	R		R	R		
	0511-003	5	3.9	30.8	11	4.5	0.7		R	R		R	R		
	0520-003			39.8	20				R	R		R	R		
	0620-003	6	3.9	39.8	20	5.3	1.0		R	R		R	R		
	0630-003			49.8	30				R	R		R	R		
	0720-003	7	3.9	39.8	20	6.2	1.0		R	R		R	R		
	0730-003			49.8	30				R	R		R	R		
VNB R/L	0206-02	2	3.9	26.5	6	1.8	0.25	0.2				R	R		
	0311-02	3	3.9	30.8	11	2.6	0.4				R	R	R		
	0411-02	4	3.9	30.8	11	3.5	0.5				R	●	R		
	0420-02			39.8	20							R	R		
	0511-02	5	3.9	30.8	11	4.5	0.7					R	R		
	0520-02			39.8	20							R	R		
	0620-02	6	3.9	39.8	20	5.3	1.0					R	R		
	0630-02			49.8	30							R	R		
	0720-02	7	3.9	39.8	20	6.2	1.0					R	R		
	0730-02			49.8	30							R	R		

☆ System Tip-Bar is available for

Micro Internal Grooving (VNG-type) ➡ P.230
Micro Face Grooving (VNFG-type) ➡ P.245
Micro Internal Threading (VNT-type) ➡ P.294
by replacing the Insert.

○: Check Availability R : R-hand Only

● Insert Dimension

Description		Min. Bore Dia.	Dimension (mm)						Insert Grade						
									Cermet	PVD Coated			Carbide	Diamond	
		φA	H	L1	L2	F	S	R	TC60	PR630	PR915	PR930	KW10	KPD010	KPD001
VNB型	0206-003NB	2	3.9	26.5	6	1.8	0.25	0.03				R	R		
	0311-003NB	3	3.9	30.8	11	2.6	0.4					R	R		
	0411-003NB	4	3.9	30.8	11	3.5	0.5		R	R		R	R		
	0420-003NB			39.8	20				R	R		R	R		
	0511-003NB	5	3.9	30.8	11	4.5	0.7		R	R		R	R		
	0520-003NB			39.8	20				R	R		R	R		
	0620-003NB	6	3.9	39.8	20	5.3	1.0		R	R		R	R		
	0630-003NB			49.8	30				R	R		R	R		
	0720-003NB	7	3.9	39.8	20	6.2	1.0		R	R		R	R		
	0730-003NB			49.8	30				R	R		R	R		
VNB型	0206-02NB	2	3.9	26.5	6	1.8	0.25	0.2					R		
	0311-02NB	3	3.9	30.8	11	2.6	0.4						R		
	0411-02NB	4	3.9	30.8	11	3.5	0.5						R	R	R
	0420-02NB			39.8	20								R	R	R
	0511-02NB	5	3.9	30.8	11	4.5	0.7						R	R	R
	0520-02NB			39.8	20								R	R	R
	0620-02NB	6	3.9	39.8	20	5.3	1.0						R	R	R
	0630-02NB			49.8	30								R	R	R
	0720-02NB	7	3.9	39.8	20	6.2	1.0						R	R	R
	0730-02NB			49.8	30								R	R	R
VNBT型	0411-003	4	3.9	30.8	11	3.6	1.0	0.03		R		R	R		
	0420-003			39.8	20					R		R	R		
	0511-003	5	3.9	30.8	11	4.6	1.3			R		R	R		
	0520-003			39.8	20					R		R	R		
VNBT型	0411-01	4	3.9	30.8	11	3.6	1.0	0.1				R	R		
	0420-01			39.8	20							R	R		
	0511-01	5	3.9	30.8	11	4.6	1.3					R	R		
	0520-01			39.8	20							R	R		

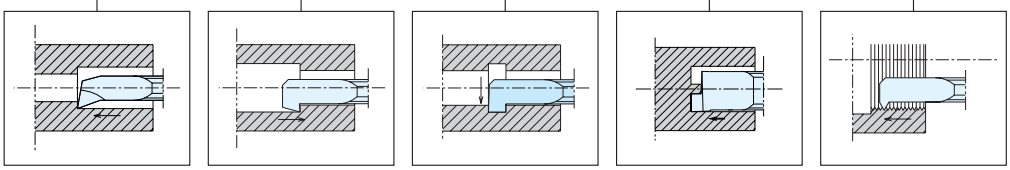
System Tip-Bar is contained in 5-pc Pack.

◆ Recommended Cutting Conditions

Work Material	Recommended Insert Grade (Cutting Speed: m/min)							VNB02 type		VNB03 type		VNB04 VNBT04 type		VNB05 VNB06 VNB07 VNBT05 type		Remark
	Cermet	PVD Coated			Carbide	Diamond										
	TC60	PR630	PR915	PR930	KW10	KPD010	KPD001	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	
General Steel	☆ 60~120	☆ 30~100	☆ 50~150	★ 30~100				~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Wet Cutting
Stainless Steel	☆ 50~100	☆ 30~80	☆ 50~150	★ 30~80				~0.3	~0.02	~0.4	~0.03	~0.45	~0.05	~0.5	~0.07	
Non-ferrous Metal					☆ ~100	★ ~300	☆ ~300	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

★: 1st Recommendation ☆: 2nd Recommendation

◆ Application of System Tip-Bar



Boring | Back Boring | Grooving ➡ P.230 | Face Grooving ➡ P.245 | Threading ➡ P.294

○: Check Availability R : R-hand Only

System Tip-Bar for Micro Boring

■ SVN Square Shank (Straight)

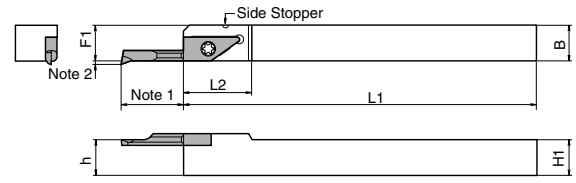


Fig.1

■ SVNS Square Shank (L-shape)

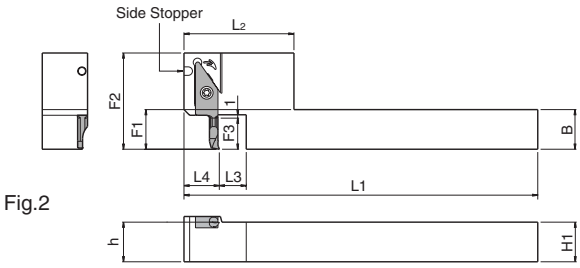


Fig.2

● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

Note 1 & Note 2 : See Insert Dimension (Page 154-155)

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	B	L1	L2	L3	L4	F1	F2	F3	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Screw (Side Stopper)	Spare Parts: Wrench	Applicable Insert (→P.154〜155, P.230, P.245, P.294)
SVNR/L	1010H -12	●		10	10	100	22	-	-	10	-	-	Fig.1	SB-3080TR	FT-10	HS3X4	LW-1.5	VNBR/L○○○○-○○○
	1212K -12	●		12	12	125				12								VNBTR○○○○-○○○
	1616K -12	●		16	16	125				16						HS3X8		VNGR○○○○-○○
	2020K -12	●		20	20	125				20						HS3X12		VNFGR○○○○-○○
	2525M -12	●		25	25	150				25						HS3X16		VNTR○○○○-○○
SVNSR/L	1010K -12-06	●		10	10	125	45	10	12	10	29	6	Fig.2	SB-3080TR	LTW-10S	HS3X4	LW-1.5	(VNBR○○06-○○○)※
	1010K -12-11	●		10	10	125		10	12	10	33	11						(VNBR○○11-○○○)※ (VNBTR○○11-○○○)※ (VNGR○○○○-11)※ (VNTR○○○-11)※
	1212M -12-06	●		12	12	150	45	10	12	12	29	6	Fig.2	SB-3080TR	LTW-10S	HS3X4	LW-1.5	(VNBR○○06-○○○)※
	1212M -12-11	●		12	12	150		10	12	12	33	11						(VNBR○○11-○○○)※ (VNBTR○○11-○○○)※ (VNGR○○○○-11)※ (VNTR○○○-11)※
	1212M -12-20	●		12	12	150		10	12.5	12	42	20						(VNBR○○20-○○○)※ (VNBTR○○20-○○○)※ (VNGR○○○○-20)※
	1616M -12-06	●		16	16	150	45	16	12	16	29	6	Fig.2	SB-3080TR	LTW-10S	HS3X4	LW-1.5	(VNBR○○06-○○○)※
	1616M -12-11	●		16	16	150		16	12	16	33	11						(VNBR○○11-○○○)※ (VNBTR○○11-○○○)※ (VNGR○○○○-11)※ (VNTR○○○-11)※
	1616M -12-20	●		16	16	150		16	12.5	16	42	20						(VNBR○○20-○○○)※ (VNBTR○○20-○○○)※ (VNGR○○○○-20)※

※All System Tip-Bar Inserts are available to SVNSR/L Toolholder, but when setting the Cutting Edge at the Toolholder Face Level as shown in Fig. 2, use the Insert of ( ) for the applicable Insert.
In that case, the Toolholder Dimension F3 becomes the same as L2 of Insert Dimension.

●: Std. Stock ○: Check Availability

System Tip-Bar

■ S···SVN Round Shank (Standard)

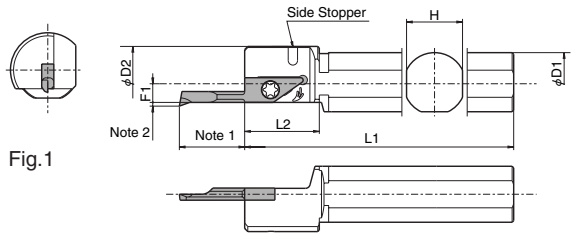


Fig.1

● Right-hand Shown

■ S···SVN-S Round Shank (Straight)

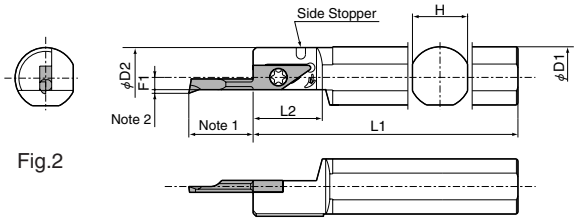


Fig.2

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

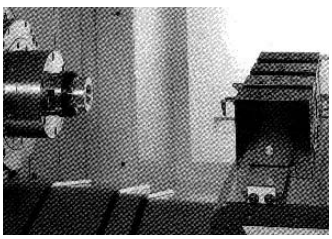
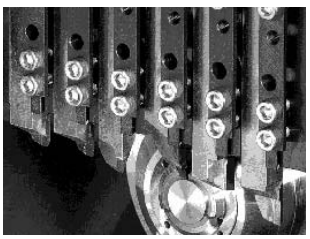
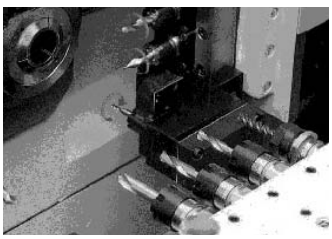
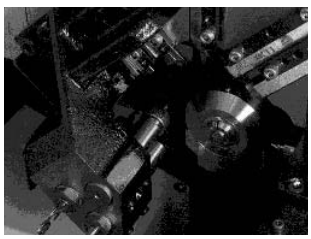
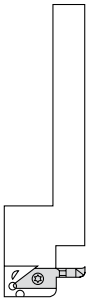
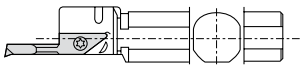
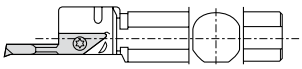
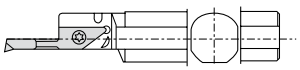
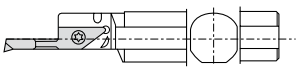
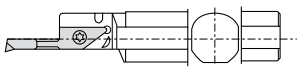
Note 1 & Note 2 : See Insert Dimension (Page 154-155)

● Toolholder Dimension

Description	Stock R	Stock L	Dimension (mm) φD1	φD2	H	L1	L2	F1	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Screw Side Stopper	Spare Parts: Wrench	Applicable Insert
S12F-SVNR/L12	●	●	12	19	11	80	23	4	Fig.1	SB-3080TR	FT-10	HS3X4	LW-1.5	VNBR/LOOOO-OO VNBTROOOO-OOO VNGROOOO-OO VNFGROOOO-OO VNTROOOO-OO
S16H-SVNR/L12	●	●	16	22	15	100	23	6						
S19H-SVNR/L12	●		19.05	24	17	100	24	6				HS3X8		
S19N-SVNR/L12	●		19.05	24	17	160	24	6						
S20H-SVNR/L12	●		20	24	18	100	24	6						
S25H-SVNR/L12	○		25.4	30	23	100	24	6				HS3X12		
S25Q-SVNR/L12	○		25.4	30	23	180	24	6						
S19H-SVNR/L12S	●		19.05	18.5	17	100	23	4	Fig.2	SB-3080TR	FT-10	HS3X4	LW-1.5	
S20H-SVNR/L12S	●		20	19.5	18	100	23	4						
S22K-SVNR/L12S	●		22	21.5	20	125	23	4						

■ Selection of Suitable System Tip-Bar

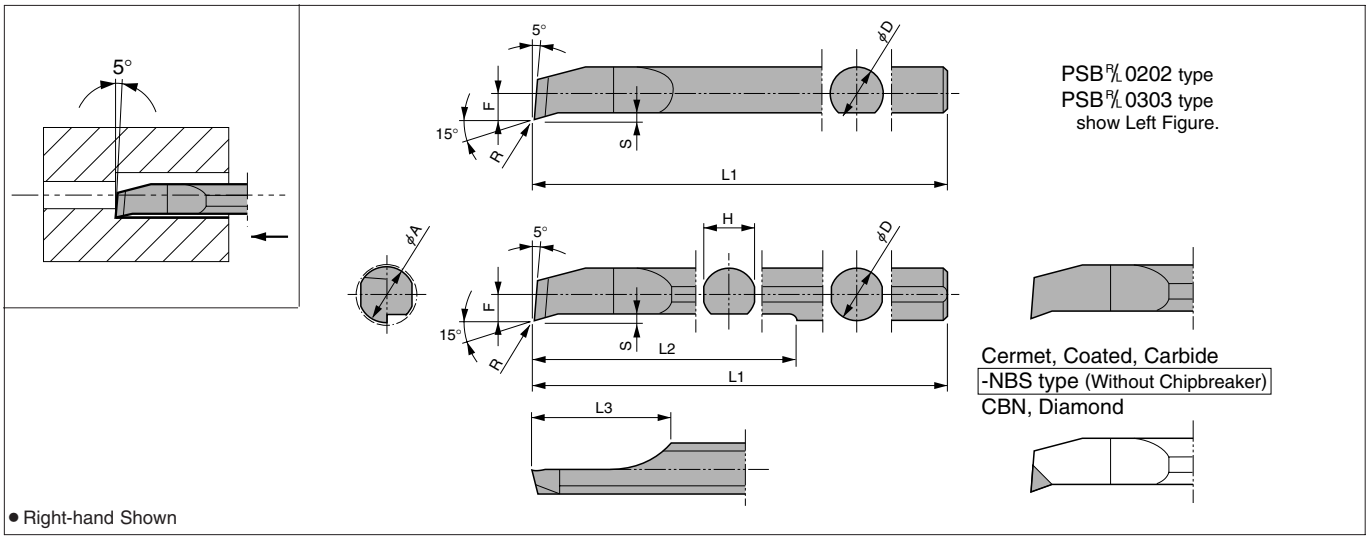
Applicable Toolholder may change according to machines used and installing position.
Automatic Lathe has various toolpost types other than those below.

Gang-Type (Horizontal) (Popular in HDD Machining)	Gang-Type	Gang-Type (Front Loading Sleeve Type)	Gang-Type (Back Loading Sleeve Type)
			
Square Shank (Straight) 	Square Shank (L-shape) 	Square Shank ———	Square Shank ———
Round Shank (Standard) 		Round Shank (Standard) 	Round Shank (Standard) ———
Round Shank (Straight) 		Round Shank (Straight) 	Round Shank (Straight) 

●: Std. Stock ○: Check Availability

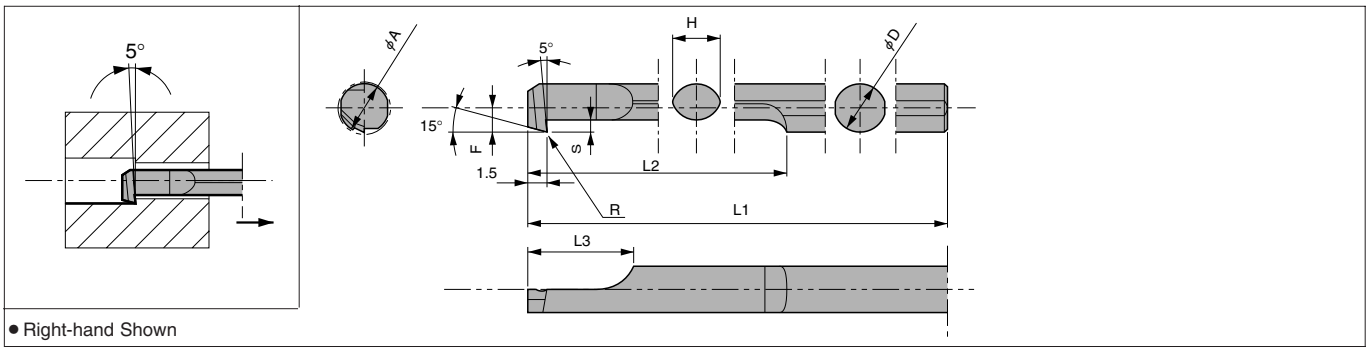
Tip-Bar for Micro Boring ＜Overhang Length Adjustable＞

■ PSB-S (Blind Hole Boring)



● Right-hand Shown

■ PSBT-S (Back Boring)



● Right-hand Shown

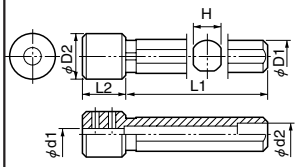
● Tip-Bar Dimension

Description		Min. Bore Dia.	Dimension (mm)								Insert Grade						
											Cermet	PVD Coated		Carbide	CBN	Diamond	
		ϕA	ϕD	H	L1	L2	L3	F	S	R	TC60	PR630	PR930	KW10	KBN10B	KPD010	KPD001
PSB□	0202-50S	2	1.8	-	50	-	5	0.9	0.25	0.05			●	R			
	0303-50S	3	2.8	-	50	-	7	1.4	0.3	0.05			●	R			
	0404-60S	4	3.8	3.6	60	30	10	1.9	0.5	0.05	R	○	●	●			
	0505-70S	5	4.8	4.4	70	40	12	2.4	0.5	0.05	●	○	●	●			
	0606-70S	6	5.8	5.2	70	45	12	2.9	0.5	0.05	R	○	○	●			
	0707-80S	7	6.8	6.2	80	50	12	3.4	0.5	0.05	●	○	○	●			
PSB□	0202-50NBS	2	1.8	-	50	-	5	0.9	0.25	0.05			R	●			
	0303-50NBS	3	2.8	-	50	-	7	1.4	0.3	0.05			R	●	R		
	0404-60NBS	4	3.8	3.6	60	30	10	1.9	0.5	0.05	●	R	R	●	R	R	R
	0505-70NBS	5	4.8	4.4	70	40	12	2.4	0.5	0.05	R	R	R	●	R	R	R
	0606-70NBS	6	5.8	5.2	70	45	12	2.9	0.5	0.05	R	R	R	R	R	R	R
	0707-80NBS	7	6.8	6.2	80	50	12	3.4	0.5	0.05	R	R	R	R	R	R	R
PSBT□	0415-60S	4	3.8	3.6	60	20	8	1.9	1.0	0.05		R	●	○			
	0515-70S	5	4.8	4.6	70	20	8	2.4	1.3	0.05		R	●	○			

Tip-Bar is contained in 1-pc Pack.

●: Std. Stock ○: Check Availability R : R-hand Only

● Applicable Sleeve

Shape	Description	(Old Description)	Stock	Dimension (mm)							Spare Parts		Applicable Tip Bar
				φD1	φD2	φd1	φd2	H	L1	L2	Screw	Wrench	
	PH 0212-60	PH-0212	●	12	19	1.8	6	11	60	20	HS3X4	LW-1.5	PSBR 0202-50S/NBS
	0312-60	-0312	●			2.8							PSBR 0303-50S/NBS
	0412-60	-0412	●			3.8					HS4X4	LW-2	PSBR 0404-60S/NBS PSBTR 0415-60S
	0512-60	-0512	●			4.8							PSBR 0505-70S/NBS PSBTR 0515-70S
	0612-60	-0612	●			5.8	8						PSBR 0606-70S/NBS
	0712-60	-0712	●			6.8							PSBR 0707-80S/NBS
	PH 0216-80	PH-0216	●	16	22	1.8	Rp¼ (PS¼)	14	80	20	HS3X4	LW-1.5	PSBR 0202-50S/NBS
	0316-80	-0316	●			2.8							PSBR 0303-50S/NBS
	0416-80	-0416	●			3.8					HS4X4	LW-2	PSBR 0404-60S/NBS PSBTR 0415-60S
	0516-80	-0516	●			4.8							PSBR 0505-70S/NBS PSBTR 0515-70S
	0616-80	-0616	●			5.8							PSBR 0606-70S/NBS
	0716-80	-0716	●			6.8							PSBR 0707-80S/NBS

◆ Recommended Cutting Conditions

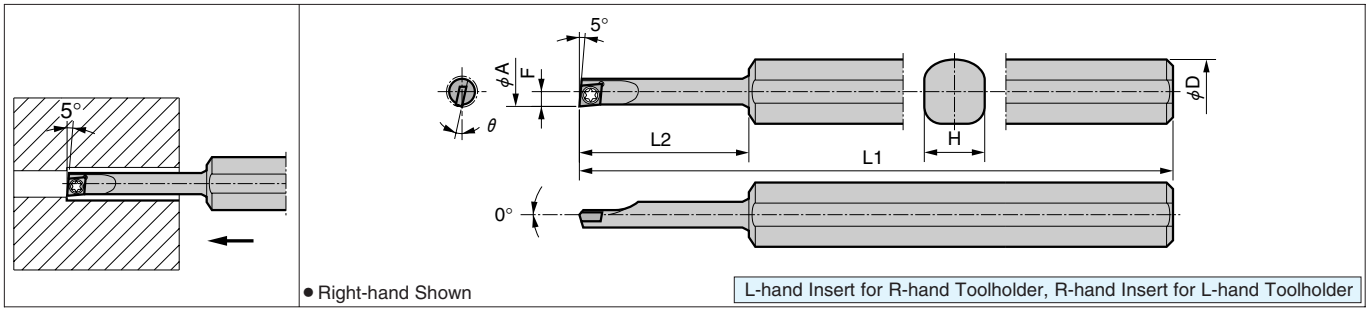
Work Material	Recommended Grade (V_C: m/min)							PSB02 type		PSB03 type		PSB04 PSBT04 type		PSB05 PSB06 PSB07 PSBT05 type		Remark
	Cermet	PVD Coated		Carbide	CBN	Diamond										
	TC60	PR630	PR930	KW10	KBN10B	KPD010	KPD001	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	ap (mm)	f (mm/rev)	
General Steel	☆ 60~120	☆ 30~100	★ 30~100					~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Wet Cutting
Stainless Steel	☆ 50~100	☆ 30~80	★ 30~80					~0.3	~0.02	~0.4	~0.03	~0.45	~0.05	~0.5	~0.07	
High Hard Mat'l					★ ~100			-	-	~0.07	~0.03	~0.10	~0.05	~0.15	~0.07	
Non-ferrous Metal				☆ ~100		★ ~300	☆ ~300	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

★: 1st Recommendation ☆: 2nd Recommendation

Boring Bars [CC□□ Insert] — Screw Clamp

■ S···SCLC-E Excellent Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~5

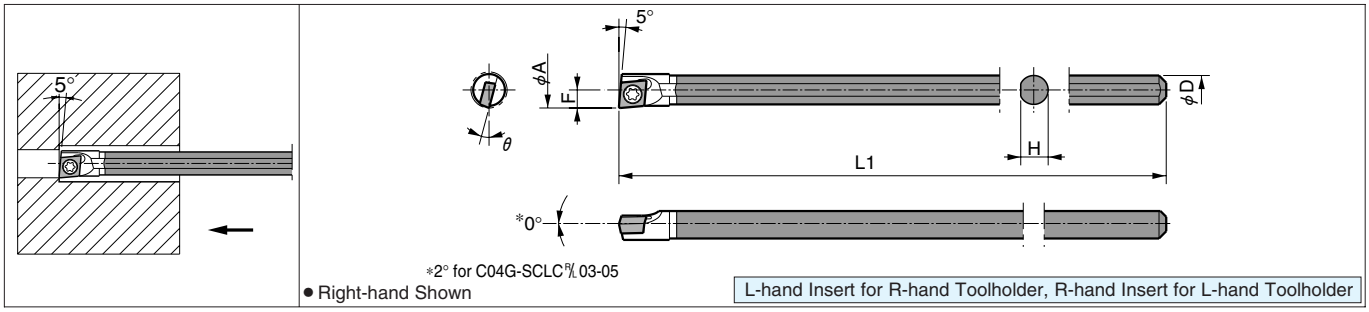


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SCLC Carbide Shank Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7



*2° for C04G-SCLCR/L 03-05

● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F			θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S10H-SCLCR/L 03-05E	SCLCR/L 0510B-03E	●	●	5	10	9	100	24	2.5			15°	0.2	SB-1630TR	FT-6
S10H-SCLCR/L 03-06E	0610B-03E	●	●	6	10	9	100	28	3.0			13°			
S10J-SCLCR/L 04-07E	0710B-04E	●	○	7	10	9	110	32	3.5			13°	0.2	SB-2040TR	
S10J-SCLCR/L 04-08E	0810B-04E	●	○	8	10	9	110	37	4.0			11°			
C04G-SCLCR/L 03-05	SCLCR/L 0504B-03W	●	●	5	4	3.8	90	-	2.5			15°	0.2	SB-1630TR	FT-6
C05H-SCLCR/L 03-06	0605B-03W	●	●	6	5	4.4	100	-	3.0			13°			
C06J-SCLCR/L 04-07	0706B-04W	●	●	7	6	5.4	110	-	3.5			13°	0.2	SB-2040TR	
C07K-SCLCR/L 04-08	0807B-04W	●	●	8	7	6.4	125	-	4.0			11°			

● Applicable Insert

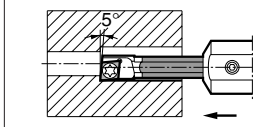
Application	Finishing	Finishing / Precision	Non-ferrous Metal	High Hard Mat'l						
Ref. Page	58	58	460	446						
Shape / Toolholder	R/L-F	R/L-FSF	Diamond	CBN						
----SCLCR/L 03----	CCGT0301..	CCET0301..	–	CCMW0301..						
----SCLCR/L 04----	CCGT0401..	CCET0401..	CCGW0401..	CCMW0401..						

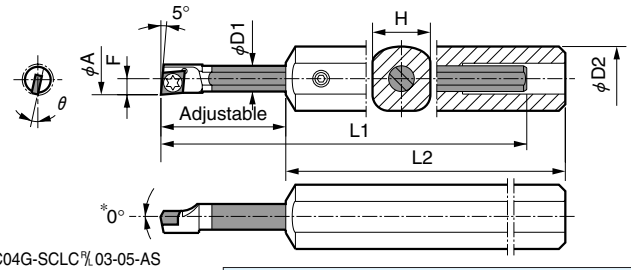
●: Std. Stock ○: Check Availability

Boring Bars [CC○○ Insert] <Overhang Length Adjustable> Screw Clamp

■ C···SCLC-AS Carbide Shank Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7





*2° for C04G-SCLC□03-05-AS

● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

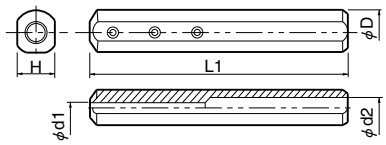
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD1	φD2	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
C04G-SCLC□03-05-AS	SCLC□ 05B-03W-AS	●	●	5	4	16	14	90	100	2.5	15°	0.2	SB-1630TR	FT-6
C05H-SCLC□03-06-AS	06B-03W-AS	●	●	6	5	16	14	100	100	3.0	13°			
C06J-SCLC□04-07-AS	07B-04W-AS	●	●	7	6	16	14	110	100	3.5	13°	0.2	SB-2040TR	
C07K-SCLC□04-08-AS	08B-04W-AS	●	●	8	7	16	14	125	100	4.0	11°			

(Note) -AS means the set item of Toolholder and Sleeve.

● Components

Set: Description	Set: (Old Description)	Toolholder (P.160): Description	Toolholder (P.160): (Old Description)	Sleeve: Description	Sleeve: (Old Description)
C04G-SCLC□03-05-AS	SCLC□ 05B-03W-AS	C04G-SCLC□03-05	SCLC□ 0504B-03W	SH0416-100	SH-0516
C05H-SCLC□03-06-AS	06B-03W-AS	C05H-SCLC□03-06	0605B-03W	SH0516-100	-0616
C06J-SCLC□04-07-AS	07B-04W-AS	C06J-SCLC□04-07	0706B-04W	SH0616-100	-0716
C07K-SCLC□04-08-AS	08B-04W-AS	C07K-SCLC□04-08	0807B-04W	SH0716-100	-0816

● Applicable Sleeve



Description	(Old Description)	Stock	Dimension (mm) φD	φd1	φd2	H	L1	Spare Parts: Screw	Spare Parts: Wrench
SH 0416-100	SH -0516	●	16	4	5	14	100	HS4X4	LW-2
0516-100	-0616	●	16	5	6	14	100		
0616-100	-0716	●	16	6	7	14	100		
0716-100	-0816	●	16	7	8	14	100		

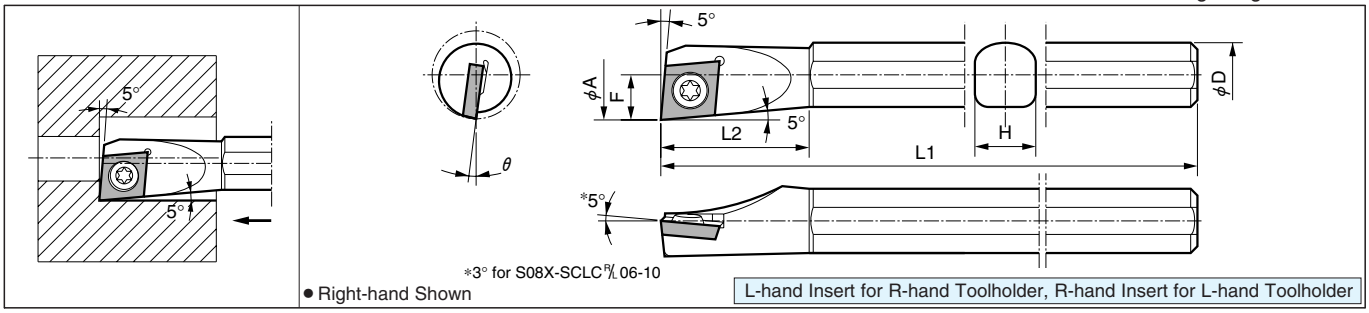
● Applicable Insert

Application	Finishing	Finishing/Precision	Non-ferrous Metal	High Hard Mat'l
Ref. Page	58	58	460	446
Shape / Toolholder	□-F	□-FSF	Diamond	CBN
····SCLC□03····	CCGT0301..	CCET0301..	–	CCMW0301..
····SCLC□04····	CCGT0401..	CCET0401..	CCGW0401..	CCMW0401..

Boring Bars [CC□□/CP□□ Insert]

■ S···SCLP(C) Steel Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3

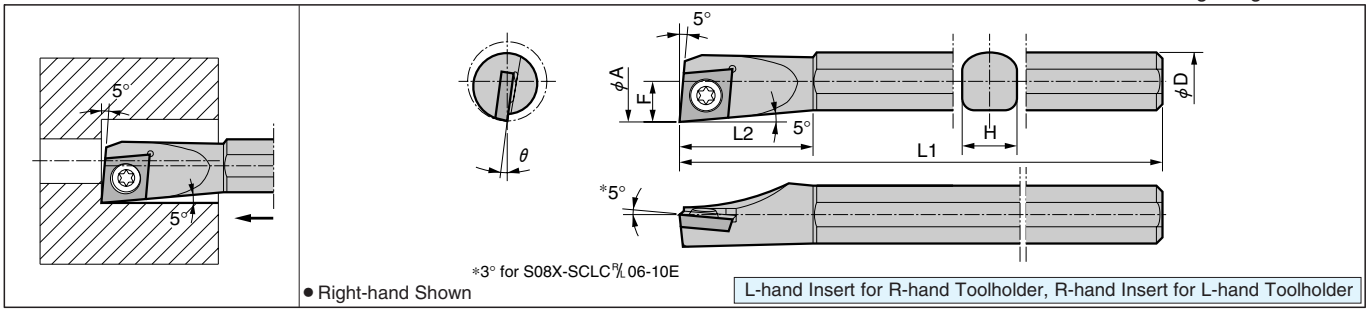


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SCLP(C)-E Excellent Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~5



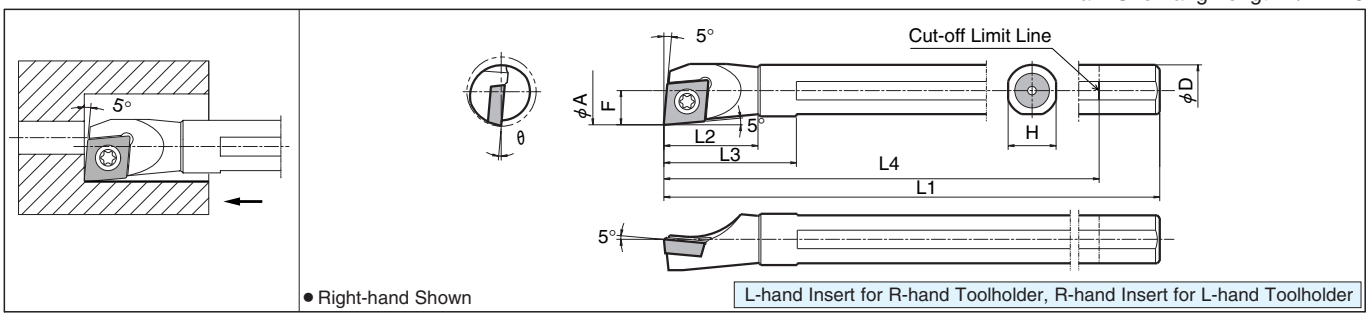
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

NEW

■ K···SCLP Strong Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~6

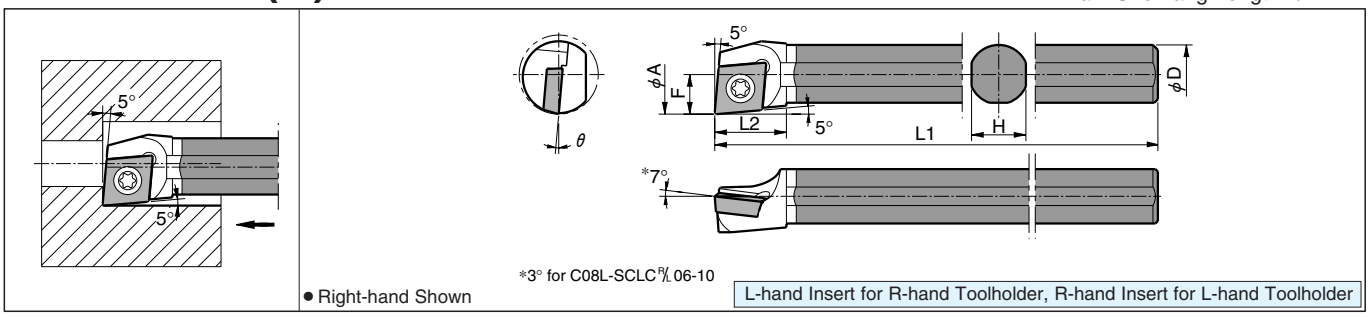


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SCLP(C) Carbide Shank Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S08X-SCLCR 06-10	SCLCR 1008B-06	○	○	10	8	7	120	17	–	–	5	12°	0.2	SB-2545TR	FT-8
S10M-SCLPR 08-12	SCLPR 1210B-08	○	○	12	10	9	150	23	–	–	6	5°	0.4	SB-3STR	FT-10
S12M-SCLPR 08-14	1412B-08	○	○	14	12	11	150	26	–	–	7	4°			
S12M-SCLPR 09-16	1612B-09	○	○	16	12	11	150	29	–	–	8	4°	0.4	SB-4TR	FT-15
S16N-SCLPR 09-18	1816B-09	○	○	18	16	15	160	32	–	–	9	3.5°			
S16Q-SCLPR 09-20	2016B-09	○	○	20	16	15	180	34	–	–	10	3°			
S20R-SCLPR 09-25	2520B-09	○	○	25	20	19	200	37	–	–	12.5	0°			
S25S-SCLPR 09-30	3025B-09	○	●	30	25	24	250	40	–	–	15	0°			

●: Std. Stock ○: Check Availability

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S08X-SCLCR/L06-10E	SCLCR/L 1008B-06E	●	●	10	8	7	120	17	–	–	5	12°	0.2	SB-2545TR	FT-8
S10M-SCLPR/L08-12E	SCLPR/L 1210B-08E	●	●	12	10	9	150	23	–	–	6	5°	0.4	SB-3STR	FT-10
S12M-SCLPR/L08-14E	1412B-08E	●	●	14	12	11	150	26	–	–	7	4°			
S12M-SCLPR/L09-16E	1612B-09E	●	●	16	12	11	150	29	–	–	8	4°	0.4	SB-4TR	FT-15
S16Q-SCLPR/L09-18E	1816B-09E	●	●	18	16	15	180	32	–	–	9	3.5°			
S16R-SCLPR/L09-20E	2016B-09E	●	●	20	16	15	200	34	–	–	10	3°			
S20X-SCLPR/L09-25E	2520B-09E	●	●	25	20	19	220	37	–	–	12.5	0°			
K10M-SCLPR/L08-12		○	○	12	10	9.2	150	19	27	125	6	5°	0.4	SB-3STR	FT-10
K12P-SCLPR/L08-14		○	○	14	12	11.2	170	22	31	143	7	4°			
K12P-SCLPR/L09-16		○	○	16	12	11.2	170	22	31	143	8	4°	0.4	SB-4TR	FT-15
K16X-SCLPR/L09-18	–	○	○	18	16	15	210	25	35	187	9	3.5°			
K16X-SCLPR/L09-20		○	○	20	16	15	210	25	35	187	10	3°			
K20X-SCLPR/L09-25		○	○	25	20	19	260	31	42	234	12.5	0°			
K25X-SCLPR/L09-30		○	○	30	25	24	320	38	49	292	15	0°			
C08L-SCLCR/L06-10	SCLCR/L 1008B-06W	●	●	10	8	7	140	10	–	–	5	10°	0.2	SB-2545TR	FT-8
C10N-SCLPR/L08-12	SCLPR/L 1210B-08W	○	○	12	10	9	160	12	–	–	6	8°	0.4	SB-3STR	FT-10
C10N-SCLPR/L08-12-1/2	1210B-08W-1/2	○		12	10	9	80	12	–	–	6	8°			
C10N-SCLPR/L08-12-2/3	1210B-08W-2/3	○		12	10	9	105	12	–	–	6	8°			
C12Q-SCLPR/L09-16	1612B-09W	●	○	16	12	11	180	14	–	–	8	5°	0.4	SB-4TR	FT-15
C12Q-SCLPR/L09-16-1/2	1612B-09W-1/2	○		16	12	11	90	14	–	–	8	5°			
C12Q-SCLPR/L09-16-2/3	1612B-09W-2/3	○		16	12	11	120	14	–	–	8	5°			
C16X-SCLPR/L09-20	2016B-09W	○	○	20	16	15	220	15	–	–	10	3°			
C16X-SCLPR/L09-20-1/2	2016B-09W-1/2	○		20	16	15	110	15	–	–	10	3°			
C16X-SCLPR/L09-20-2/3	2016B-09W-2/3	○		20	16	15	145	15	–	–	10	3°			
C20S-SCLPR/L09-25	2520B-09W	○	●	25	20	19	250	17	–	–	12.5	0°			
C20S-SCLPR/L09-25-1/2	2520B-09W-1/2	○		25	20	19	125	17	–	–	12.5	0°			
C20S-SCLPR/L09-25-2/3	2520B-09W-2/3	○		25	20	19	165	17	–	–	12.5	0°			

K···SCLP Strong Bar

· Prefix "K" of the Description means Strong Mechanism
· Do not clamp the Part "L3" of the Toolholder, or the expected performance may not be obtained.
· Toolholder Shank can be shorted to the Cut-off Limit Line.
· Cutting-off exceeding the Cut-off Limit Line means to cut the carbide core part, and it may deteriorate the Anti-Vibration performance.

● Applicable Insert

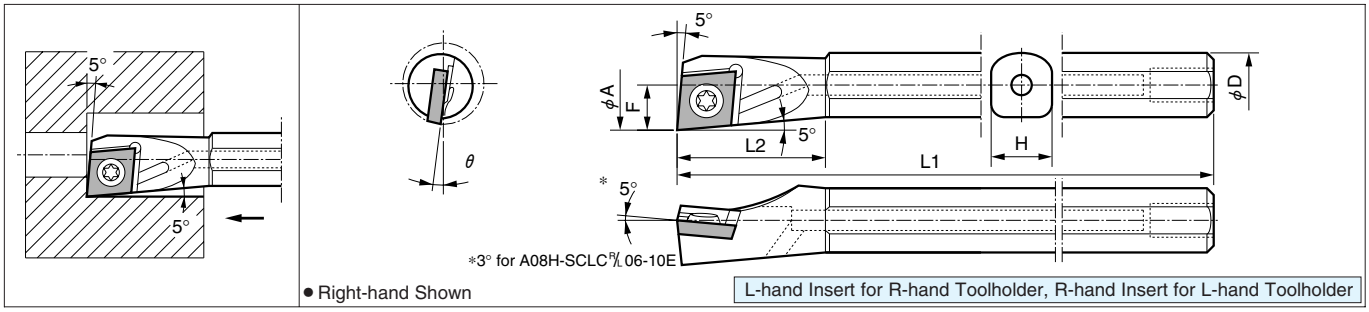
Application	Finishing	Finishing-Medium	Medium	Medium	Finishing	Finishing - Medium	Finishing	Finishing - Medium	Low Feed	Low Feed/Precision
Ref. Page	57	57	57	58	58	58	59	59	59	59
Shape / Toolholder	GP	HQ	Conventional	GK	R/L-F12	R/L-Y	R/L-FS	FN-Z	(E/F)R/L-U	FR/L-USF
----SCLCR/L06----	–	CCMT0602..	CCGT0602..	CCMT0602..	–	–	CCGT0602..	CCGT0602..	CCGT0602..	CCET0602..
----SCLPR/L08----	CPMT0802..	CPMH0802..	CPMH0802..	–	CPMH0802..	CPMH0802..	–	–	–	–
----SCLPR/L09----	CPMT0903..	CPMH0903..	CPMH0903..	–	CPMH0903..	CPMH0903..	–	–	–	–
Application	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	High Hard Mat'l					
Ref. Page	58	58	59	460	446					
Shape / Toolholder	XP	XQ	No Chipbreaker	Diamond	CBN					
----SCLCR/L06----	–	–	CCGW0602..	CCMT0602.. CCGW0602..	CCMW0602..					
----SCLPR/L08----	CPMT0802..	–	CPMB0802..	CPMH0802..	CPGB0802..					
----SCLPR/L09----	CPMT0903..	CPMT0903..	CPMB0903..	CPMH0903..	CPGB0903..					

●: Std. Stock ○: Check Availability

Boring Bars [CC□□/CP□□ Insert]

■ A···SCLC Steel Twin-Hole Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3

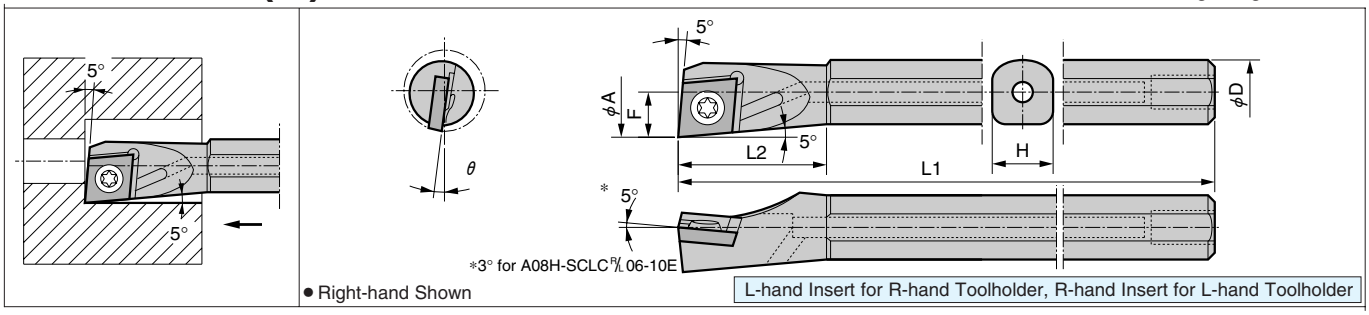


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ A···SCLP(C)-E Excellent Twin-Hole Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~5



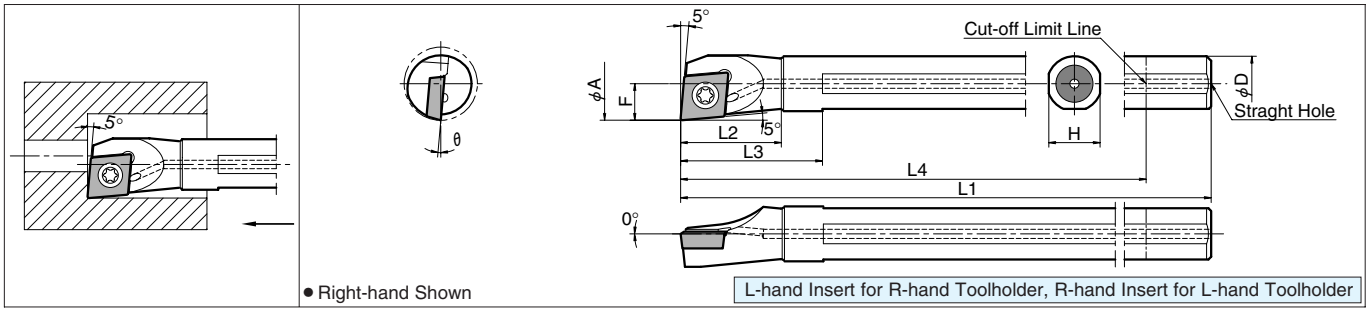
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

NEW

■ K···SCLC-H Strong Bar with Single Coolant Hole (Boring/Internal Facing)

Max. Overhang Length L/D=~6

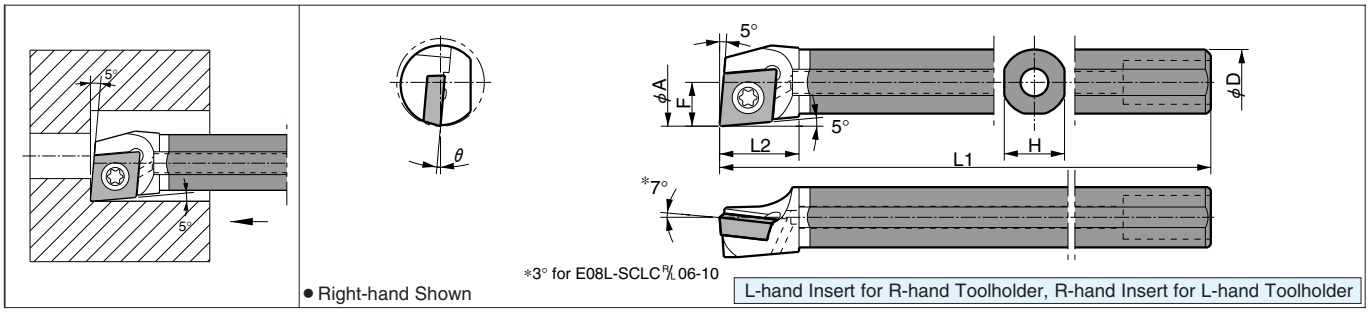


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ E···SCLP(C) Carbide Twin-Hole Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
A08H-SCLCR/L06-10	–	●	●	10	8	7	100	17	-	-	5	12°	0.4	SB-2545TR	FT-8
A10X-SCLCR/L06-12		●	●	12	10	9	120	23	-	-	6	10°			
A12X-SCLCR/L06-14		●	●	14	12	11	120	25	-	-	7	8°			
A12X-SCLCR/L06-16		●	●	16	12	11	120	29	-	-	8	7°			
A16M-SCLCR/L09-20		●	●	20	16	15	150	34	-	-	10	8°	0.8	SB-4TR	FT-15
A20Q-SCLCR/L09-25		●	●	25	20	19	180	37	-	-	12.5	6°			

K···SCLC-H Strong Bar

· Prefix "K" of the Description means Strong Mechanism
· Do not clamp the Part "L3" of the Toolholder, or the expected performance may not be obtained.
· Toolholder Shank can be shorted to the Cut-off Limit Line.
· Cutting-off exceeding the Cut-off Limit Line means to cut the carbide core part, and it may deteriorate the Anti-Vibration performance.

● : Std. Stock ○ : Check Availability

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	φD	H	L1	L2	L3	L4	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
A08H-SCLC□06-10E	SCLC□ 1008B-06EH	●	○	10	8	7	100	17	-	-	5	12°	0.2	SB-2545TR	FT-8
A10X-SCLP□08-12E	SCLP□ 1210B-08EH	○	○	12	10	9	120	23	-	-	6	5°	0.4	SB-3STR	FT-10
A12X-SCLP□08-14E	1412B-08EH	○	○	14	12	11	120	25	-	-	7	4°			
A12X-SCLP□09-16E	1612B-09EH	○	○	16	12	11	120	29	-	-	8	4°	0.4	SB-4TR	FT-15
A16M-SCLP□09-18E	1816B-09EH	●	○	18	16	15	150	31	-	-	9	3.5°			
A16M-SCLP□09-20E	2016B-09EH	●	○	20	16	15	150	34	-	-	10	3°			
A20Q-SCLP□09-25E	2520B-09EH	●	●	25	20	19	180	37	-	-	12.5	0°			
K10M-SCLC□06-12H	–	●	●	12	10	9	150	19	27	125	6	10°	0.4	SB-2545TR	FT-8
K12P-SCLC□06-14H		●	●	14	12	11	170	22	31	143	7	8°			
K12P-SCLC□06-16H		●	●	16	12	11	170	22	31	143	8	7°		SB-2560TR	
K16X-SCLC□09-18H		●	●	18	16	15	210	25	35	187	9	10°	0.4	SB-4085TR	FT-15
K16X-SCLC□09-20H		●	●	20	16	15	210	25	35	187	10	8°			
K20X-SCLC□09-25H		●	●	25	20	19	260	31	42	234	12.5	5°			
K25X-SCLC□09-30H		●	●	30	25	24	320	38	49	292	16	4°			
E08L-SCLC□06-10	SCLC□ 1008B-06WH	●	○	10	8	7	140	10	-	-	5	10°	0.2	SB-2545TR	FT-8
E10N-SCLP□08-12	SCLP□ 1210B-08WH	●	○	12	10	9	160	12	-	-	6	8°	0.4	SB-3STR	FT-10
E12Q-SCLP□09-16	1612B-09WH	○	○	16	12	11	180	14	-	-	8	5°	0.4	SB-4TR	FT-15
E16X-SCLP□09-20	2016B-09WH	○	○	20	16	15	220	15	-	-	10	3°			
E20S-SCLP□09-25	2520B-09WH	●	●	25	20	19	250	17	-	-	12.5	0°			

● Applicable Insert

Application	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Low Feed
Ref. Page	57	57	57	58	58	58	58	59	59	59
Shape / Toolholder	GP	HQ	Conventional	GK	HF	□-F12	□-Y	□-FS	FN-Z	(E/F)□-U
----SCLC□06----	–	CCMT0602..	CCGT0602..	CCMT0602..	–	–	–	CCGT0602..	CCGT0602..	CCGT0602..
----SCLC□09----	–	CCMT09T3..	CCGT09T3..	CCMT09T3..	CCMT09T3..	–	–	CCGT09T3..	CCGT09T3..	CCGT09T3..
----SCLP□08----	CPMT0802..	CPMH0802..	CPMH0802..	–	–	CPMH0802..	CPMH0802..	–	–	–
----SCLP□09----	CPMT0903..	CPMH0903..	CPMH0903..	–	–	CPMH0903..	CPMH0903..	–	–	–

Application	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l		
Ref. Page	59	58	58	59	58	59	460	446		
Shape / Toolholder	F□-USF	XP	XQ	No Chipbreaker	AH	A3	Diamond	CBN		
----SCLC□06----	CCET0602..	–	–	CCGW0602..	–	–	CCMT0602.. CCGW0602..	CCMW0602..		
----SCLC□08----	CCET09T3..	–	–	CCGW09T3..	CCGT09T3..	CCGT09T3..	CCMT09T3.. CCGW09T3..	CCMW09T3..		
----SCLP□08----	–	CPMT0802..	–	CPMB0802..	–	–	CPMH0802..	CPGB0802..		
----SCLP□09----	–	CPMT0903..	CPMT0903..	CPMB0903..	–	–	CPMH0903..	CPGB0903..		

● Applicable Coolant Sleeve/Joint

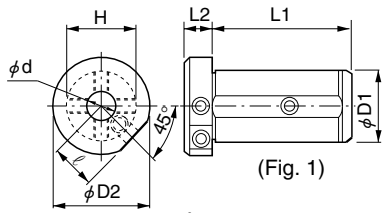
Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A08H-SCLC□06-10	SHC0840-70 / SHC0850-95	SJS-5
A10X-SCLC□06-12	SHC1040-70 / SHC1050-95	
A12X-SCLC□06-14	SHC1240-70 / SHC1250-95	SJS-6
A12X-SCLC□06-16		
A16M-SCLC□09-20	SHC1640-70 / SHC1650-95	SJS-8
A20Q-SCLC□09-25	SHC2040-70 / SHC2050-95	
A08H-SCLC□06-10E	SHC0840-70 / SHC0850-95	SJS-5
A10X-SCLP□08-12E	SHC1040-70 / SHC1050-95	
A12X-SCLP□08-14E	SHC1240-70 / SHC1250-95	SJS-6
A12X-SCLP□09-16E		
A16M-SCLP□09-18E	SHC1640-70 / SHC1650-95	SJS-8
A16M-SCLP□09-20E		
A20Q-SCLP□09-25E	SHC2040-70 / SHC2050-95	

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
K10M-SCLC□06-12H	SHC1040-70 / SHC1050-95	–
K12P-SCLC□06-14H	SHC1240-70 / SHC1250-95	–
K12P-SCLC□06-16H		
K16X-SCLC□09-18H	SHC1640-70 / SHC1650-95	–
K16X-SCLC□09-20H		
K20X-SCLC□09-25H	SHC2040-70 / SHC2050-95	
K25X-SCLC□09-30H	SHC2540-70 / SHC2550-95	
E08L-SCLC□06-10	SHC0840-70,SHC0850-95	SJS-5
E10N-SCLP□08-12	SHC1040-70,SHC1050-95	
E12Q-SCLP□09-16	SHC1240-70,SHC1250-95	SJS-6
E16X-SCLP□09-20	SHC1640-70,SHC1650-95	SJS-8
E20S-SCLP□09-25	SHC2040-70,SHC2050-95	

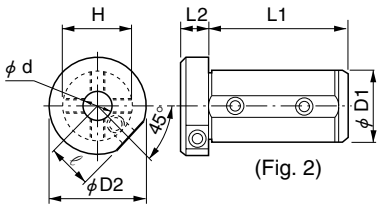
● See Page 166 for Details of the Coolant Sleeve / Joint

● : Std. Stock ○ : Check Availability

Coolant Sleeve



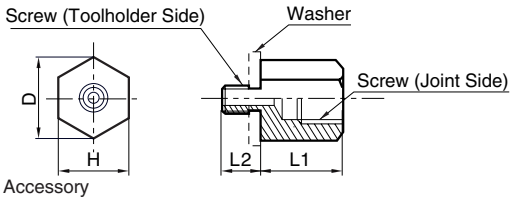
(Fig. 1)



(Fig. 2)

Accessory
- Back Cover/SHL-4···SHC○○40-70 SHL-5···SHC○○50-95
- Back Cover Screw
- Shank Clamp Screw (Front / Back Screw)

Coolant Joint



Accessory
- Washer
  WB-5···SJS-5
  WB-6···SJS-6
  WB-8···SJS-8

(Note) To stabilize the Toolholder and to avoid the Coolant Leak, Tighten all Screws firmly

● Coolant Sleeve Dimension

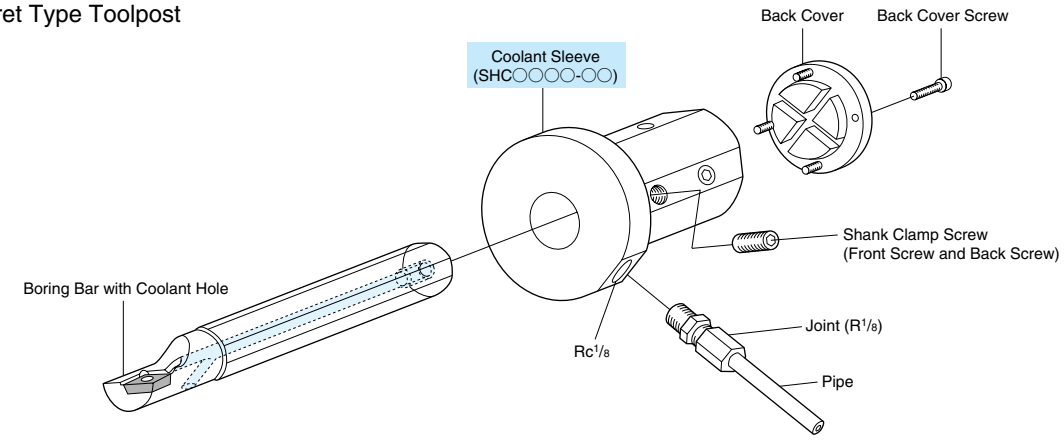
Description	(Old Description)	Stock	Dimension (mm) ϕD1	ϕD2	ϕd	L1	L2	H	ℓ	Shape	Spare Parts: Front Screw	Wrench	Back Screw	Wrench	Back Cover	Back Cover Screw	Wrench
SHC 0840-70	SHC -084070	●	40	56	8	70	16	38	27	Fig.1	HS6X22	LW-3	HS6X14	LW-3	SHL-4	HH3X6	LW-2.5
1040-70	-104070	●	40	56	10	70	16	38	27								
1240-70	-124070	●	40	56	12	70	16	38	27		HS10X10	LW-5	HS10X10	LW-5	SHL-4	HH3X6	LW-2.5
1640-70	-164070	●	40	56	16	70	16	38	27								
2040-70	-204070	●	40	56	20	70	16	38	27								
2540-70	-254070	○	40	56	25	70	16	38	27		HS10X10	LW-5	HS6X6	LW-3	SHL-4	HH3X6	LW-2.5
SHC 0850-95	SHC -085095	○	50	65	8	95	16	47	30.5	Fig.2	HS6X22	LW-3	HS6X14	LW-3	SHL-5	HH3X12	LW-2.5
1050-95	-105095	○	50	65	10	95	16	47	30.5								
1250-95	-125095	○	50	65	12	95	16	47	30.5		HS10X10	LW-5	HS10X10	LW-5	SHL-5	HH3X12	LW-2.5
1650-95	-165095	○	50	65	16	95	16	47	30.5								
2050-95	-205095	○	50	65	20	95	16	47	30.5								
2550-95	-255095	○	50	65	25	95	16	47	30.5								

● Coolant Joint Dimension

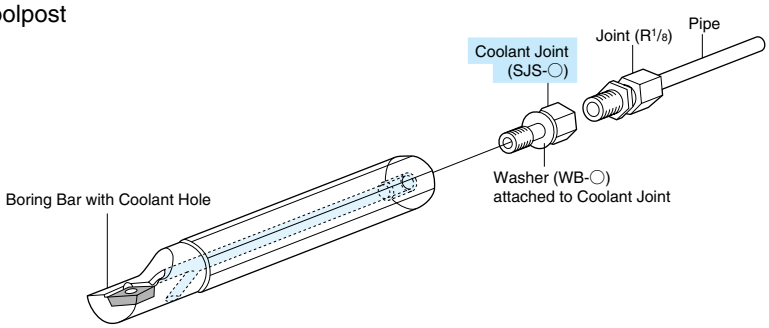
Description	Stock	Dimension (mm) D	L1	L2	H	Screw (Toolholder Side)	Screw (Joint Side)	Spare Parts: Washer
SJS-5	○	15	15	7	13	M5XP0.8	Rc1/8 (PT1/8)	WB-5
SJS-6	○	15	15	9	13	M6XP1.0	Rc1/8 (PT1/8)	WB-6
SJS-8	●	15	15	13	13	M8XP1.25	Rc1/8 (PT1/8)	WB-8

◆ How to Install Coolant Sleeve / Coolant Joint

1 For Turret Type Toolpost



2 For Gang Type Toolpost

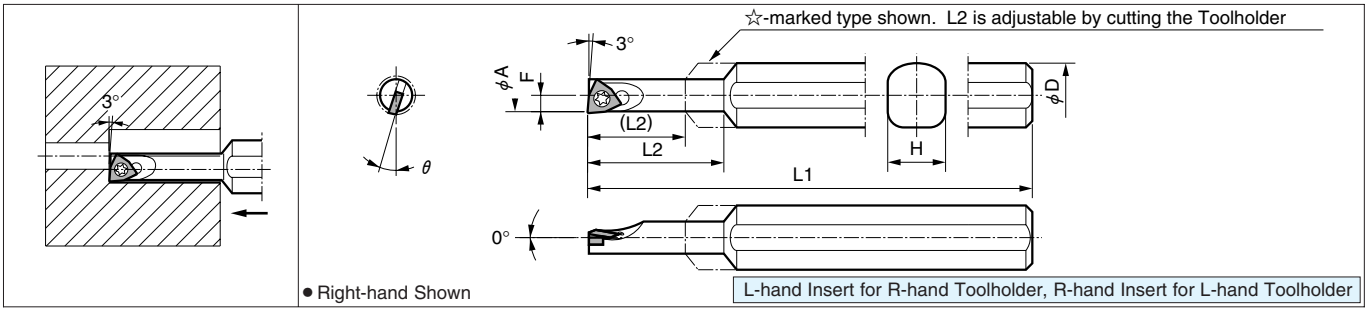


● : Std. Stock ○ : Check Availability

Boring Bars [WB□□ Insert] Screw Clamp

■ S···SWUB Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3

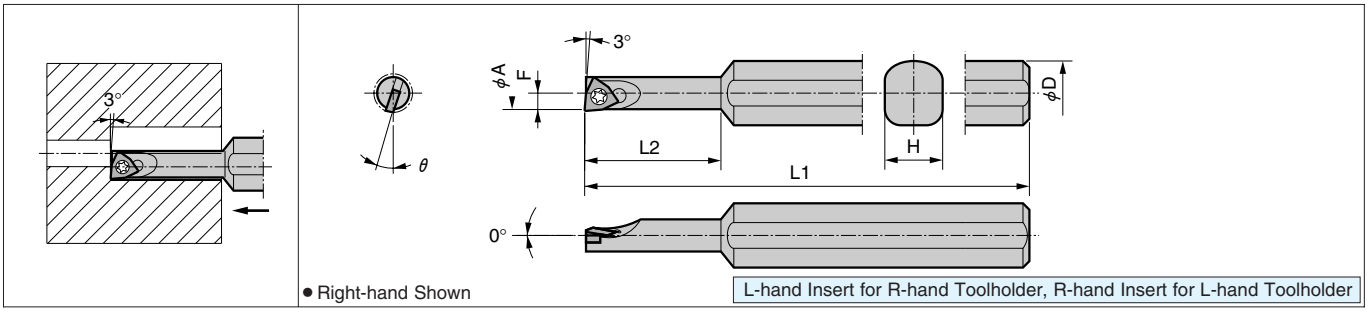


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SWUB-E Excellent Bar (Blind Hole Boring)

Max. Overhang Length L/D=~5

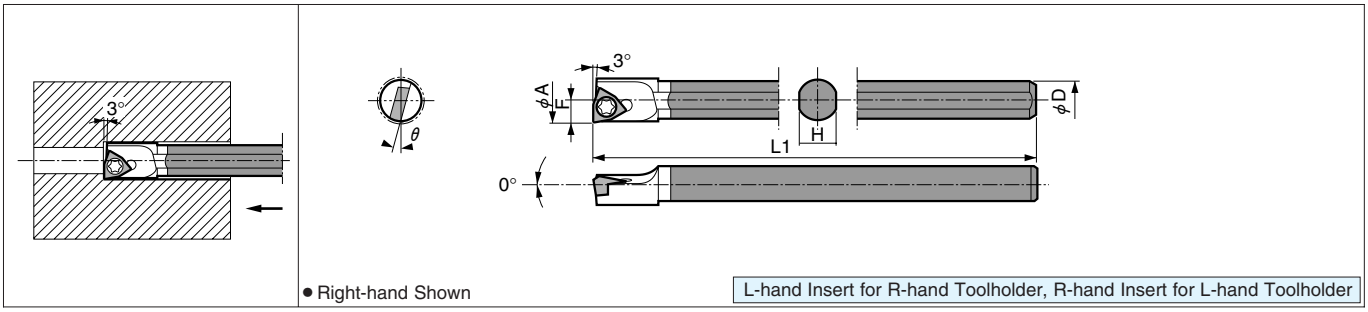


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SWUB Carbide Shank Bar (Blind Hole Boring)

Max. Overhang Length L/D=~7



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2 (L2)	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S10H-SWUBR/L06-06	SWUBR/L0610B-06	○	○	6	10	9	100	21	3	15°			
S10H-SWUBR/L06-06-15	☆ 0610B-06-15	●	●	6	10	9	100	(15)	3	15°	0.2	SB-2040TR	
S10H-SWUBR/L06-07	0710B-06	○	○	7	10	9	100	24.5	3.5	13°			FT-6
S10J-SWUBR/L08-08	0810B-08	○	○	8	10	9	110	28	4	15°	0.2	SB-2050TR	
S10J-SWUBR/L08-08-20	☆ 0810B-08-20	●	●	8	10	9	110	(20)	4	15°			
S10H-SWUBR/L06-06E	–	●	●	6	10	9	100	28	3	15°	0.2	SB-2040TR	FT-6
S10H-SWUBR/L06-07E		●	●	7	10	9	100	32	3.5	13°			
S10J-SWUBR/L08-08E		●	●	8	10	9	110	37	4	15°	0.2	SB-2050TR	FT-6
C05H-SWUBR/L06-06	SWUBR/L0605B-06W	●	●	6	5	4.4	100	-	3	15°	0.2	SB-2040TR	FT-6
C06J-SWUBR/L06-07	0706B-06W	●	●	7	6	5.4	110	-	3.5	13°			
C07K-SWUBR/L08-08	0807B-08W	●	●	8	7	6.4	125	-	4	15°	0.2	SB-2050TR	

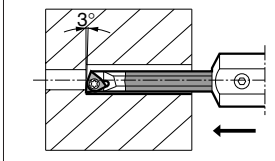
● Applicable Insert

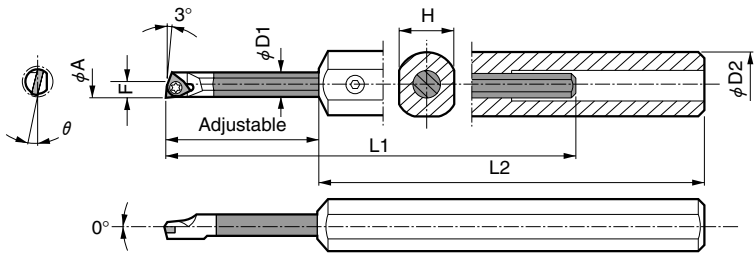
Application	Finishing	Finishing	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	60	60	61	460	446, 447
Shape / Toolholder	DP	R/L-F	No Chipbreaker	Diamond	CBN
----SWUBR/L06----	WBMT0601..	WBGT0601..	WBGW0601..	WBMT0601..	WBGW0601..
----SWUBR/L08----	WBMT0802..	WBGT0802..	WBGW0802..	WBMT0802..	WBGW0802..

● : Std. Stock ○ : Check Availability

■ C···SWUB-AS Carbide Shank Bar (Blind Hole Boring)

Max. Overhang Length L/D=～7





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

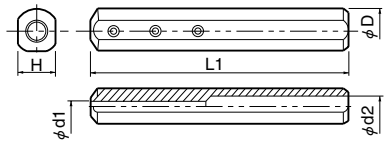
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD1	φD2	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
C05H-SWUBR/L06-06-AS	SWUBR/L06B-06W-AS	●	●	6	5	16	14	100	100	3	15°	0.2	SB-2040TR	FT-6
C06J-SWUBR/L06-07-AS	07B-06W-AS	●	●	7	6	16	14	110	100	3.5	13°			
C07K-SWUBR/L08-08-AS	08B-08W-AS	●	●	8	7	16	14	125	100	4	15°	0.2	SB-2050TR	

(Note) -AS means the set item of Toolholder and Sleeve.

● Components

Set: Description	Set: (Old Description)	Toolholder ➡ P.165: Description	Toolholder: (Old Description)	Sleeve: Description	Sleeve: (Old Description)
C05H-SWUBR/L06-06-AS	SWUBR/L06B-06W-AS	C05H-SWUBR/L06-06	SWUBR/L 0605B-06W	SH0516-100	SH-0616
C06J-SWUBR/L06-07-AS	07B-06W-AS	C06J-SWUBR/L06-07	0706B-06W	SH0616-100	-0716
C07K-SWUBR/L08-08-AS	08B-08W-AS	C07K-SWUBR/L08-08	0807B-08W	SH0716-100	-0816

● Applicable Sleeve



Description	(Old Description)	Stock	Dimension (mm) φD	φd1	φd2	H	L1	Spare Parts: Screw	Spare Parts: Wrench
SH 0516-100	SH -0616	●	16	5	6	14	100	HS4X4	LW-2
0616-100	-0716	●	16	6	7	14	100		
0716-100	-0816	●	16	7	8	14	100		

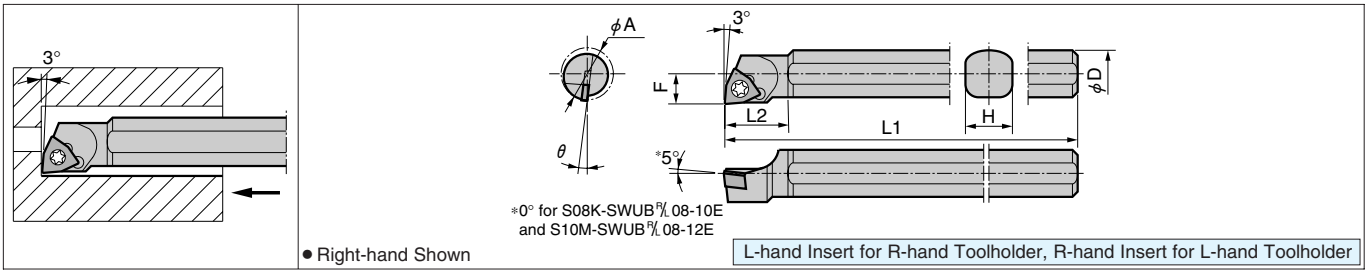
● Applicable Insert

Application	Finishing	Finishing	Cast Iron	Non-Ferrous Metal	High Hard Mat'l
Ref. Page	60	60	61	460	446, 447
Shape / Toolholder	DP	R/L-F	No Chipbreaker	Diamond	CBN
----SWUBR/L06----	WBMT0601..	WBGT0601..	WBGW0601..	WBMT0601..	WBGW0601..
----SWUBR/L08----	WBMT0802..	WBGT0802..	WBGW0802..	WBMT0802..	WBGW0802..

Boring Bars [WB□□/WP□□ Insert] Screw Clamp

■ S···SWUP(B)-E Excellent Bar (Blind Hole Boring)

Max. Overhang Length L/D=~5

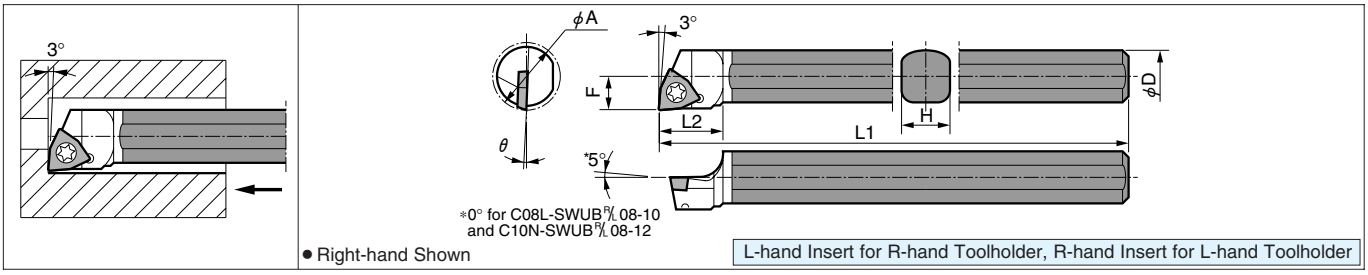


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SWUP(B) Carbide Shank Bar (Blind Hole Boring)

Max. Overhang Length L/D=~7



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. ϕA	Dimension (mm) ϕD	H	L1	L2	F			θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S08K-SWUBR/L08-10E	SWUBR/L 1008B-08E	●	●	10	8	7	125	17	5			13°	0.2	SB-2050TR	FT-6
S10M-SWUBR/L08-12E	1210B-08E	●	●	12	10	9	150	23	6			10°			
S12M-SWUPR/L11-14E	SWUPR/L 1412B-11E	●	●	14	12	11	150	26	7			4°	0.4	SB-2545TR	FT-8
S12M-SWUPR/L11-16E	1612B-11E	●	●	16	12	11	150	29	8			2°		SB-2560TR	
S16N-SWUPR/L11-18E	1816B-11E	●	●	18	16	15	160	32	9			1°			
S16Q-SWUPR/L16-20E	2016B-16E	●	●	20	16	15	180	34	10			3°	0.8	SB-4065TR	FT-15
S20R-SWUPR/L16-25E	2520B-16E	●	●	25	20	19	200	37	12.5			2°			
C08L-SWUBR/L08-10	SWUBR/L 1008B-08W	●	●	10	8	7	140	17	5			13°	0.2	SB-2050TR	FT-6
C10N-SWUBR/L08-12	1210B-08W	●	●	12	10	9	160	23	6			10°			
C10N-SWUBR/L08-12-1/2	1210B-08W-1/2	○		12	10	9	80	23	6			10°			
C10N-SWUBR/L08-12-2/3	1210B-08W-2/3	○		12	10	9	105	23	6			10°			
C12Q-SWUPR/L11-14	SWUPR/L 1412B-11W	○	○	14	12	11	180	26	7			4°	0.4	SB-2545TR	FT-8
C12Q-SWUPR/L11-14-1/2	1412B-11W-1/2	○		14	12	11	90	26	7			4°			
C12Q-SWUPR/L11-14-2/3	1412B-11W-2/3	○		14	12	11	120	26	7			4°			
C12Q-SWUPR/L11-16	1612B-11W	○	○	16	12	11	180	29	8			2°		SB-2560TR	
C12Q-SWUPR/L11-16-1/2	1612B-11W-1/2	○		16	12	11	90	29	8			2°			
C12Q-SWUPR/L11-16-2/3	1612B-11W-2/3	○		16	12	11	120	29	8			2°			
C16X-SWUPR/L11-18	1816B-11W	○	○	18	16	15	220	32	9			1°			
C16X-SWUPR/L11-18-1/2	1816B-11W-1/2	○		18	16	15	110	32	9			1°			
C16X-SWUPR/L11-18-2/3	1816B-11W-2/3	○		18	16	15	145	32	9			1°			
C16X-SWUPR/L16-20	2016B-16W	○	○	20	16	15	220	34	10			3°	0.8	SB-4065TR	FT-15
C16X-SWUPR/L16-20-1/2	2016B-16W-1/2	○		20	16	15	110	34	10			3°			
C16X-SWUPR/L16-20-2/3	2016B-16W-2/3	○		20	16	15	145	34	10			3°			
C20S-SWUPR/L16-25	2520B-16W	○	○	25	20	19	250	37	12.5			2°			
C20S-SWUPR/L16-25-1/2	2520B-16W-1/2	○		25	20	19	125	37	12.5			2°			
C20S-SWUPR/L16-25-2/3	2520B-16W-2/3	○		25	20	19	165	37	12.5			2°			

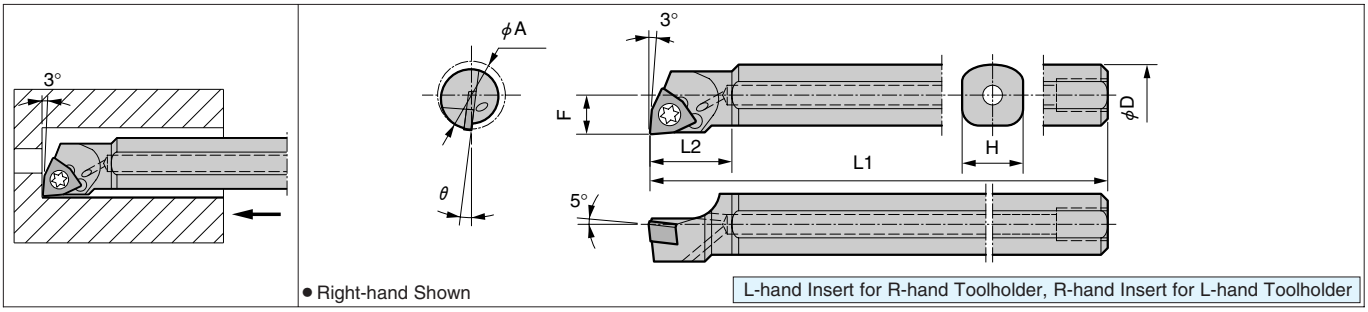
● Applicable Insert

Application	Finishing	Finishing	Finishing-Medium	Finishing	Finishing-Medium	Cast Iron	Non-ferrous Metal	High Hard Mat'l		
Ref. Page	60	60	60	60	61	61	460	446, 447		
Shape / Toolholder	GP	DP	HQ	R/L-F	R/L-Y	No Chipbreaker	Diamond	CBN		
----SWUBR/L08----	–	WBMT0802..		WBGT0802..	–	WBGW0802..	WBMT0802..	WBGW0802..		
----SWUPR/L11----	WPMT1102..	–	WPMT1102..	–	WPGT1102..	WPMW1102.. WPGW1102..	WPMT1102..	WPGW1102..		
----SWUPR/L16----	WPMT1603..	–	WPMT1603..	–	WPGT1603..	WPGW1603.. WPMW1603..	–	WPGW1603..		

● : Std. Stock ○ : Check Availability

■ A···SWUP-E Excellent Twin-Hole Bar (Blind Hole Boring)

Max. Overhang Length L/D=～5



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F			θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
A12X-SWUP[R/L]11-14E	–	●	●	14	12	11	120	26	7			4°	0.4	SB-2545TR	FT-8
A12X-SWUP[R/L]11-16E		●	●	16	12	11	120	29	8			2°		SB-2560TR	FT-8
A16M-SWUP[R/L]11-18E		●	●	18	16	15	150	32	9			1°			
A16M-SWUP[R/L]16-20E		●	●	20	16	15	150	34	10			3°	0.8	SB-4065TR	FT-15
A20Q-SWUP[R/L]16-25E		●	●	25	20	19	180	37	12.5			2°			

● Applicable Insert

Application	Finishing	Finishing-Medium	Finishing-Medium	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	60	60	61	61	460	447
Shape / Toolholder	GP	HQ	[R/L]-Y	No Chipbreaker	Diamond	CBN
----SWUP[R/L]11----	WPMT1102..	WPMT1102..	WPGT1102..	WPMW1102.. WPGW1102..	WPMT1102..	WPGW1102..
----SWUP[R/L]16----	WPMT1603..	WPMT1603..	WPGT1603..	WPGW1603.. WPMW1603..	-	WPGW1603..

● Applicable Coolant Sleeve/Joint

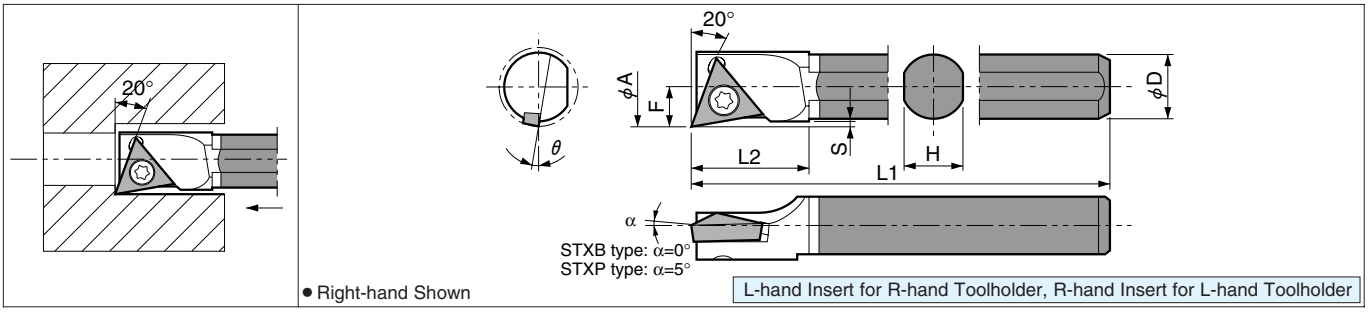
Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A12X -SWUP[R/L]11-14E A12X -SWUP[R/L]11-16E	SHC1240-70 / SHC1250-95	SJS-6
A16M -SWUP[R/L]11-18E A16M -SWUP[R/L]16-20E	SHC1640-70 / SHC1650-95	SJS-8
A20Q -SWUP[R/L]16-25E	SHC2040-70 / SHC2050-95	

● : Std. Stock ○ : Check Availability

Boring Bars [TB□□/TP□□ Insert] Screw Clamp

■ C···STXP(B) Carbide Shank Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7

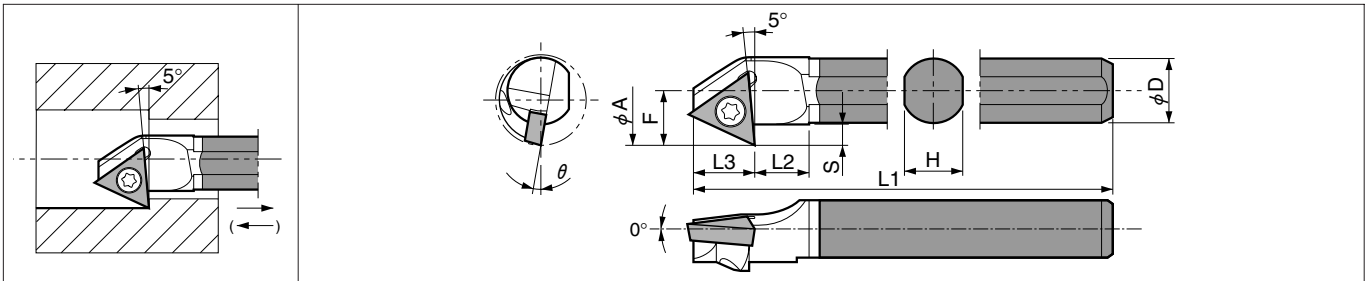


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···STZB Carbide Shank Bar (Back Boring)

Max. Overhang Length L/D=~7



● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

※ When using R-hand Toolholder, use R-hand insert for the machining direction (→)
use L-hand insert for the machining direction(←).

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
C06J-STXBR/L06-075	STXBR/L 07506B-06W	●	●	7.5	6	5.4	110	11	0.5	3.75	0.5	10°	0.03	SB-1STR	FT-6
C08X-STXPR/L08-09	STXPR/L 09008B-08W	○	○	9.0	8	7.0	143	14	0.6	4.6	0.5	10°	0.03	SB-1TR	
C10X-STXPR/L09-11	11010B-09W	○	○	11.0	10	9.0	164	17	0.6	5.6	0.5	10°	0.03	SB-2TR	
C06J-STZBR/L06-085	STZBR/L 08506B-06W	●	●	8.5	6	5.4	110	5	5.7	5.1	2.0	10°	0.03	SB-1STR	FT-6

● Applicable Insert

Application	Minute ap	Finishing	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Medium	Low Feed/Precision	Soft Steel	Cast Iron
Ref. Page	62	63	63	63	63,64	64	64	64	63	65
Shape / Toolholder	CF	GP	DP	HQ	R/L	R/L-FSF	R/L-H	FR/L-USF	XP	No Chipbreaker
----STXBR/L06----	TBGT0601..	–	TBMT0601..	–	TBGT0601..	–	–	–	–	TBGW0601..
----STXPR/L08----	TPGT0802..	–	–	–	TPGH0802..	TPET0802..	–	TPET0802..	–	TPGB0802..
----STXPR/L09----	TPGT0902..	TPMT0902..	–	TPMT0902..	TPGH0902..	–	TPGH0902..	–	TPMT0902..	TPGB0902..
----STZBR/L06----	TBGT0601..	–	TBMT0601..	–	TBGT0601..	–	–	–	–	TBGW0601..

Application	Non-ferrous Metal	High Hard Mat'l
Ref. Page	461	447
Shape / Toolholder	Diamond	CBN
----STXBR/L06----	TBMT0601.. TBGW0601..	–
----STXPR/L08----	TPMH0802.. TPGB0802..	TPGB0802..
----STXPR/L09----	TPMH0902.. TPGB0902..	TPGB0902..
----STZBR/L06----	TBMT0601.. TBGW0601..	–

◆ C···STXP(B) Boring Bar Cutting Conditions Examples

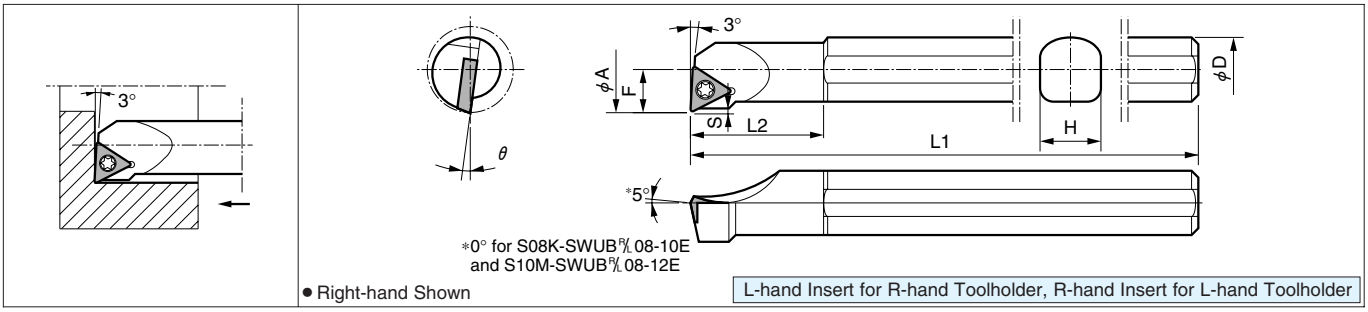
(Work Material : SCM435)

Toolholder Description	Insert Description(Grade)	Vc(m/min)	ap(mm)	f(mm/rev)	Coolant
C06J-STXBR/L06-075	TBGT0601003 L/R (PR930)	30~100	0.02~0.1	0.02~0.04	Yes
C08X-STXPR/L08-09	TPGH080201 L/R (PR930)	30~100	0.05~0.15	0.03~0.08	Yes
C10X-STXPR/L09-11	TPGH090201 R/L (PR930)	30~100	0.05~0.15	0.03~0.08	Yes

● : Std. Stock ○ : Check Availability

■ S···STUP(B) Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3

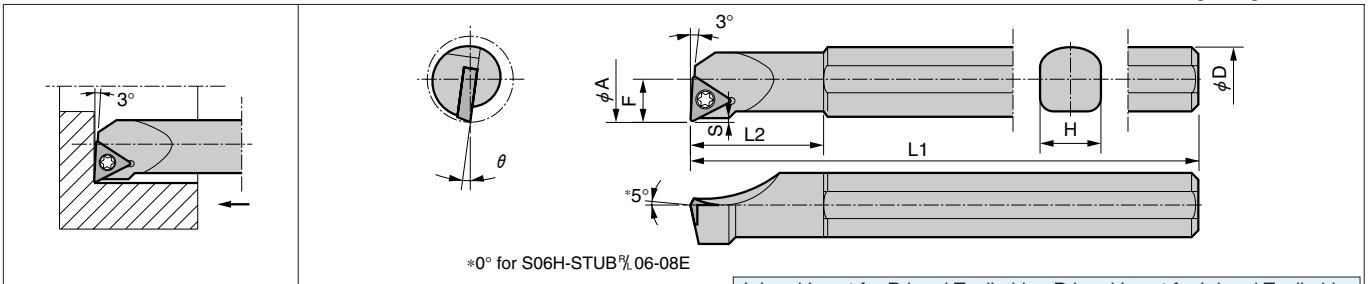


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···STUP(B)-E Excellent Bar (Blind Hole Boring)

Max. Overhang Length L/D=~5



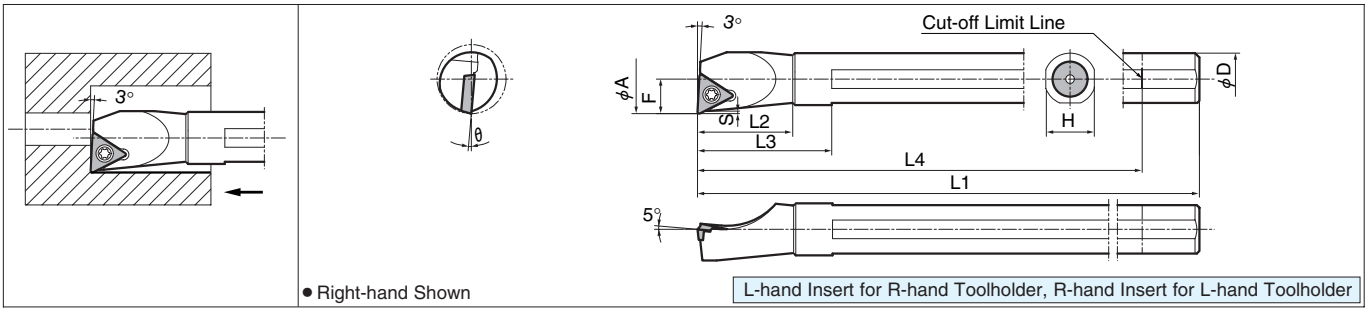
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

NEW

■ K···STUP Strong Bar (Blind Hole Boring)

Max. Overhang Length L/D=~6

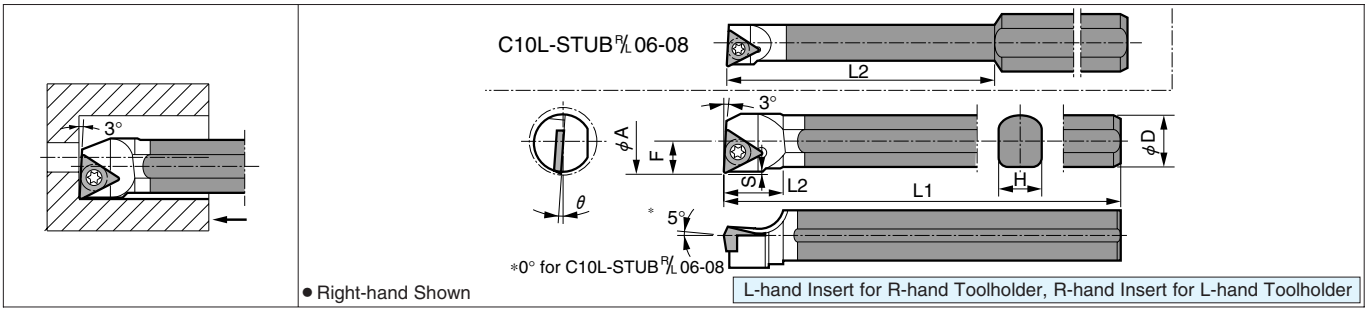


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···STUP(B) Carbide Shank Bar (Blind Hole Boring)

Max. Overhang Length L/D=~7



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S06H-STUBR/L06-08	STUBR/L 0806B-06	○	○	8	6	5.4	100	13	–	–	4	0.6	12°	0.2	SB-1STR	FT-6
S08K-STUPR/L08-10	STUPR/L 1008B-08	○	○	10	8	7	125	17	–	–	5	0.4	10°	0.4	SB-1TR	FT-6
S10M-STUPR/L09-12	1210B-09	●	○	12	10	9	150	20	–	–	6	0.5	8°	0.4	SB-2TR	FT-8
S12M-STUPR/L09-16	1612B-09	●	○	16	12	11	150	25	–	–	8	0.5	5°			
S16Q-STUPR/L11-20	2016B-11	○	○	20	16	15	180	27	–	–	10	0.9	3°	0.4	SB-3TR	FT-10
S20R-STUPR/L11-25	2520B-11	○	○	25	20	19	200	33	–	–	12.5	0.9	0°			
S25X-STUPR/L16-32	3225B-16	●	●	32	25	23.4	220	42	–	–	16	0.6	0°	0.8	SB-4TR	FT-15

● : Std. Stock ○ : Check Availability

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	φD	H	L1	L2	L3	L4	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S06H-STUBR/L06-08E	STUBR/L 0806B-06E	●	●	8	6	5.4	100	13	–	–	4	0.6	12°	0.2	SB-1STR	FT-6
S08K-STUPR/L08-10E	STUPR/L 1008B-08E	●	●	10	8	7	125	17	–	–	5	0.4	10°	0.4	SB-1TR	FT-6
S10M-STUPR/L09-12E	1210B-09E	●	○	12	10	9	150	20	–	–	6	0.5	8°	0.4	SB-2TR	FT-8
S12M-STUPR/L09-16E	1612B-09E	○	○	16	12	11	150	25	–	–	8	0.5	5°			
S10M-STUPR/L11-12E	1210B-11E	●	●	12	10	9	150	20	–	–	6	0.6	8°	0.4	SB-3TR	FT-10
S12M-STUPR/L11-14E	1412B-11E	●	●	14	12	11	150	25	–	–	7	0.6	7°			
S12M-STUPR/L11-16E	1612B-11E	●	●	16	12	11	150	25	–	–	8	0.5	5°			
S16R-STUPR/L11-18E	1816B-11E	●	●	18	16	15	200	26	–	–	9	0.7	4°			
S16R-STUPR/L11-20E	2016B-11E	●	●	20	16	15	200	26	–	–	10	0.9	3°			
S20X-STUPR/L11-25E	2520B-11E	○	○	25	20	19	220	33	–	–	12.5	0.9	0°			
S20X-STUPR/L16-25E	2520B-16E	●	●	25	20	19	220	33	–	–	12.5	0.9	0°	0.8	SB-4TR	FT-15
S25X-STUPR/L16-32E	3225B-16E	●	○	32	25	23.4	270	42	–	–	16	0.6	0°			
K10M-STUPR/L09-12	–	○	○	12	10	9.2	150	19	27	125	6	0.3	8°	0.4	SB-2TR	FT-8
K12P-STUPR/L09-14		○	○	14	12	11.2	170	22	31	143	7	0.4	6°			
K12P-STUPR/L09-16		○	○	16	12	11.2	170	22	31	143	8	0.4	5°			
K16X-STUPR/L11-18		○	○	18	16	15	210	25	35	187	9	0.5	4°	0.4	SB-3TR	FT-10
K16X-STUPR/L11-20		○	○	20	16	15	210	25	35	187	10	0.5	3°			
K20X-STUPR/L11-25		○	○	25	20	19	260	31	42	234	12.5	0.5	0°			
K25X-STUPR/L16-32		○	○	32	25	24	320	38	49	292	16	0.5	0°	0.8	SB-4TR	FT-15
C10L-STUBR/L06-08	STUBR/L 0810B-06W	●	○	8	10	9	140	50	–	–	4	0.5	12°	0.2	SB-1STR	FT-6
C08L-STUPR/L08-10	STUPR/L 1008B-08W	●	●	10	8	7	140	10	–	–	5	0.5	10°	0.4	SB-1TR	FT-6
C10N-STUPR/L09-12	1210B-09W	●	○	12	10	9	160	11	–	–	6	0.5	8°	0.4	SB-2TR	FT-8
C10N-STUPR/L09-12-1/2	1210B-09W-1/2	○		12	10	9	80	11	–	–	6	0.5	8°			
C10N-STUPR/L09-12-2/3	1210B-09W-2/3	○		12	10	9	105	11	–	–	6	0.5	8°			
C12Q-STUPR/L09-16	1612B-09W	○	○	16	12	11	180	12	–	–	8	0.7	5°			
C12Q-STUPR/L09-16-1/2	1612B-09W-1/2	○		16	12	11	90	12	–	–	8	0.7	5°			
C12Q-STUPR/L09-16-2/3	1612B-09W-2/3	○		16	12	11	120	12	–	–	8	0.7	5°			
C10N-STUPR/L11-12	1210B-11W	●	●	12	10	9	160	11	–	–	6	0.5	8°	0.4	SB-3TR	FT-10
C10N-STUPR/L11-12-1/2	1210B-11W-1/2	○		12	10	9	80	11	–	–	6	0.5	8°			
C10N-STUPR/L11-12-2/3	1210B-11W-2/3	○		12	10	9	105	11	–	–	6	0.5	8°			
C12Q-STUPR/L11-14	1412B-11W	●	●	14	12	11	180	12	–	–	7	0.5	7°			
C12Q-STUPR/L11-14-1/2	1412B-11W-1/2	○		14	12	11	90	12	–	–	7	0.5	7°			
C12Q-STUPR/L11-14-2/3	1412B-11W-2/3	○		14	12	11	120	12	–	–	7	0.5	7°			
C12Q-STUPR/L11-16	1612B-11W	○	○	16	12	11	180	12	–	–	8	0.3	5°			
C12Q-STUPR/L11-16-1/2	1612B-11W-1/2	○		16	12	11	90	12	–	–	8	0.3	5°			
C12Q-STUPR/L11-16-2/3	1612B-11W-2/3	○		16	12	11	120	12	–	–	8	0.3	5°			
C16X-STUPR/L11-18	1816B-11W	●	●	18	16	15	220	14	–	–	9	0.3	4°			
C16X-STUPR/L11-18-1/2	1816B-11W-1/2	○		18	16	15	110	14	–	–	9	0.3	4°			
C16X-STUPR/L11-18-2/3	1816B-11W-2/3	○		18	16	15	145	14	–	–	9	0.3	4°			
C16X-STUPR/L11-20	2016B-11W	○	○	20	16	15	220	14	–	–	10	0.8	3°			
C16X-STUPR/L11-20-1/2	2016B-11W-1/2	○		20	16	15	110	14	–	–	10	0.8	3°			
C16X-STUPR/L11-20-2/3	2016B-11W-2/3	○		20	16	15	145	14	–	–	10	0.8	3°			
C20S-STUPR/L11-25	2520B-11W	○	○	25	20	19	250	17	–	–	12.5	0.7	0°			
C20S-STUPR/L11-25-1/2	2520B-11W-1/2	○		25	20	19	125	17	–	–	12.5	0.7	0°			
C20S-STUPR/L11-25-2/3	2520B-11W-2/3	○		25	20	19	165	17	–	–	12.5	0.7	0°			
C20S-STUPR/L16-25	2520B-16W	●	○	25	20	19	250	17	–	–	12.5	0.3	0°	0.8	SB-4TR	FT-15
C20S-STUPR/L16-25-1/2	2520B-16W-1/2	○		25	20	19	125	17	–	–	12.5	0.3	0°			
C20S-STUPR/L16-25-2/3	2520B-16W-2/3	○		25	20	19	165	17	–	–	12.5	0.3	0°			

K···STUP Strong Bar

· Prefix "K" of the Description means Strong Mechanism.

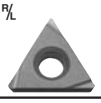
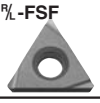
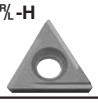
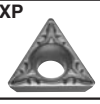
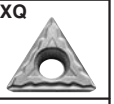
· Do not clamp the part "L3" of the Toolholder, or the expected performance may not be obtained.

· Toolholder shank can be shorted to the Cut-off Limit Line.

· Cutting-off exceeding the Cut-off Limit Line means to cut the carbide core part, and it may deteriorate the Anti-Vibration performance.

Boring Bars [TB□□/TP□□ Insert] Screw Clamp

● Applicable Insert

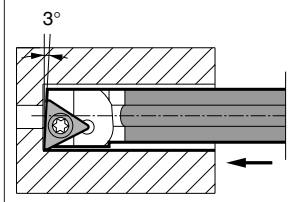
Application	Minute *ap*	Finishing	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Medium	Low Feed/Precision	Soft Steel	Soft Steel
Ref. Page	62	63	63	63	63,64	64	64	64	63	63
Shape / Toolholder	**CF** 	**GP** 	**DP** 	**HQ** 	**R** 	**R-FSF** 	**R-H** 	**FR-USF** 	**XP** 	**XQ** 
----STUBR06----	TBGT0601..	–	TBMT0601..	–	TBGT0601..	–	–	–	–	–
----STUPR08----	TPGT0802..	–	–	–	TPGH0802..	TPET0802..	–	TPET0802..	–	–
----STUPR09----	TPGT0902..	TPMT0902..	–	TPMT0902..	TPGH0902..	–	TPGH0902..	–	TPMT0902..	–
----STUPR11----	–	TPMT1103..	–	TPMT1103..	TPGH1103..	TPET1103..	TPGH1103..	TPET1103..	TPMT1103..	TPMT1103..
----STUPR16----	–	TPMT1603..	–	TPMT1603..	TPGH1603..	–	TPGH1603..	–	TPMT1603..	TPMT1603..

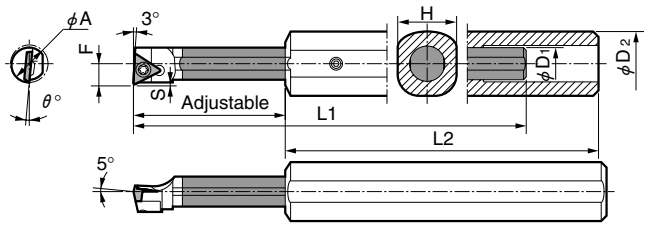
Application	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	65	460, 461	447
Shape / Toolholder	**No Chipbreaker** 	**Diamond** 	**CBN** 
----STUBR06----	TBGW0601..	TBMT0601.. TBGW0601..	–
----STUPR08----	TPGB0802..	TPMH0802.. TPGB0802..	TPGB0802..
----STUPR09----	TPGB0902..	TPMH0902.. TPGB0902..	TPGB0902..
----STUPR11----	TPGB1103..	TPMH1103.. TPGB1103..	TPGB1103..
----STUPR16----	TPGB1603..	TPMH1603.. TPGB1603..	TPGB1603..

Boring Bars [TP○○ Insert] <Overhang Length Adjustable> Screw Clamp

■ C···STUP-AS Carbide Shank Bar (Blind Hole Boring)

Max. Overhang Length L/D=~7





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

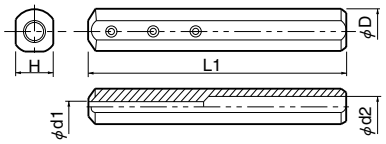
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD1	φD2	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
C08L-STUP R/L 08-10-AS	STUP R/L 10B-08W-AS	○		10	8	20	18	140	120	5	0.5	10°	0.4	SB-1TR	FT-6
C10N-STUP R/L 09-12-AS	12B-09W-AS	○		12	10	20	18	160	120	6	0.5	8°	0.4	SB-2TR	FT-8
C12Q-STUP R/L 09-16-AS	16B-09W-AS	○		16	12	25	23	180	150	8	0.7	5°			
C10N-STUP R/L 11-12-AS	12B-11W-AS	○		12	10	20	18	160	120	6	0.5	8°	0.4	SB-3TR	FT-10
C12Q-STUP R/L 11-14-AS	14B-11W-AS	○		14	12	25	23	180	150	7	0.5	7°			
C12Q-STUP R/L 11-16-AS	16B-11W-AS	○		16	12	25	23	180	150	8	0.3	5°			
C16X-STUP R/L 11-18-AS	18B-11W-AS	○		18	16	32	30	220	180	9	0.3	4°			
C16X-STUP R/L 11-20-AS	20B-11W-AS	○		20	16	32	30	220	180	10	0.8	3°			
C20S-STUP R/L 11-25-AS	25B-11W-AS	○		25	20	32	30	250	180	12.5	0.7	0°			
C20S-STUP R/L 16-25-AS	25B-16W-AS	○		25	20	32	30	250	180	12.5	0.3	0°	0.8	SB-4TR	FT-15

(Note) -AS means the set item of Toolholder and Sleeve.

● Components

Set: Description	Set: (Old Description)	Toolholder ⇒ P.170~171: Description	Toolholder: (Old Description)	Sleeve: Description	Sleeve: (Old Description)
C08L-STUP R/L 08-10-AS	STUP R/L 10B-08W-AS	C08L-STUP R/L 08-10	STUP R/L 1008B-08W	SH0820-120	SH-1020
C10N-STUP R/L 09-12-AS	12B-09W-AS	C10N-STUP R/L 09-12	1210B-09W	SH1020-120	-1220
C12Q-STUP R/L 09-16-AS	16B-09W-AS	C12Q-STUP R/L 09-16	1612B-09W	SH1225-150	-1625
C10N-STUP R/L 11-12-AS	12B-11W-AS	C10N-STUP R/L 11-12	1210B-11W	SH1020-120	-1220
C12Q-STUP R/L 11-14-AS	14B-11W-AS	C12Q-STUP R/L 11-14	1412B-11W	SH1225-150	-1625
C12Q-STUP R/L 11-16-AS	16B-11W-AS	C12Q-STUP R/L 11-16	1612B-11W	SH1225-150	-1625
C16X-STUP R/L 11-18-AS	18B-11W-AS	C16X-STUP R/L 11-18	1816B-11W	SH1632-180	-2032
C16X-STUP R/L 11-20-AS	20B-11W-AS	C16X-STUP R/L 11-20	2016B-11W	SH1632-180	-2032
C20S-STUP R/L 11-25-AS	25B-11W-AS	C20S-STUP R/L 11-25	2520B-11W	SH2032-180	-2532
C20S-STUP R/L 16-25-AS	25B-16W-AS	C20S-STUP R/L 16-25	2520B-16W	SH2032-180	-2532

● Applicable Sleeve



Description	(Old Description)	Stock	Dimension (mm) φD	φd1	φd2	H	L1	Spare Parts: Screw	Spare Parts: Wrench
SH 0820-120	SH -1020	●	20	8	9	18	120	HS4X4	LW-2
1020-120	-1220	●	20	10	11	18	120		
1225-150	-1625	●	25	12	13	23	150	HS5X5	LW-2.5
1632-180	-2032	●	32	16	18	30	180		
2032-180	-2532	○	32	20	22	30	180		

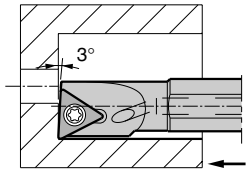
● Applicable Insert

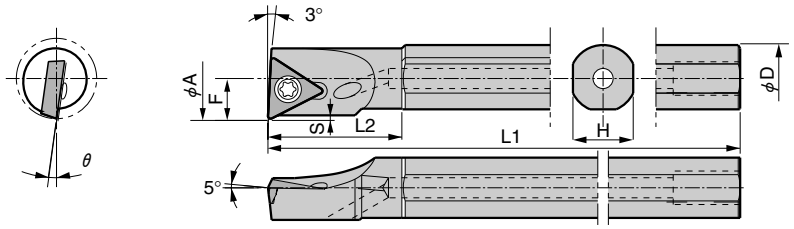
⇒ P.174

Boring Bars [TP□□ Insert] — Screw Clamp

■ A···STUP-E Excellent Twin-Hole Bar (Blind Hole Boring)

Max. Overhang Length L/D=~5



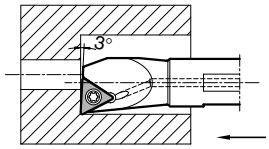


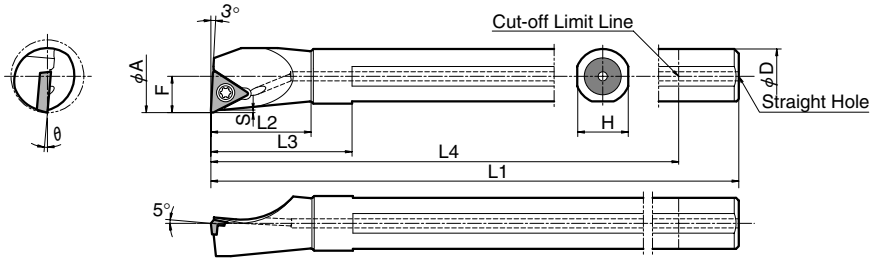
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

NEW ■ K···STUP-H Strong Bar with Single Coolant Hole (Blind Hole Boring)

Max. Overhang Length L/D=~6



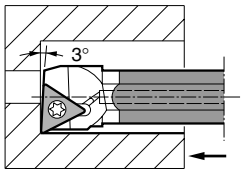


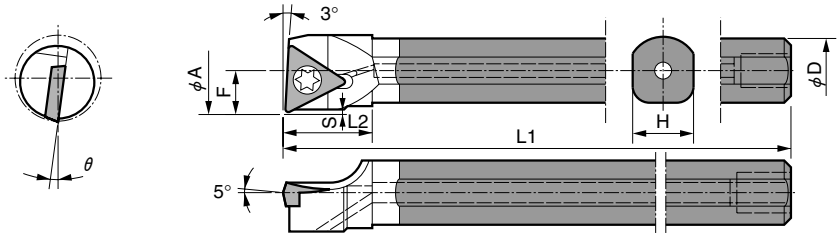
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ E···STUP Carbide Twin-Hole Bar (Blind Hole Boring)

Max. Overhang Length L/D=~7





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
A08H-STUP□08-10E	STUP□ 1008B-08EH	●	●	10	8	7	100	17	–	–	5	0.4	10°	0.4	SB-1TR	FT-6
A10X-STUP□09-12E	1210B-09EH	●	●	12	10	9	120	20	–	–	6	0.5	8°	0.4	SB-2TR	FT-8
A12X-STUP□09-16E	1612B-09EH	●		16	12	11	120	25	–	–	8	0.5	5°			
A10X-STUP□11-12E	1210B-11EH	●	●	12	10	9	120	20	–	–	6	0.6	8°	0.4	SB-3TR	FT-10
A12X-STUP□11-14E	1412B-11EH	●	●	14	12	11	120	25	–	–	7	0.6	7°			
A12X-STUP□11-16E	1612B-11EH	●	●	16	12	11	120	25	–	–	8	0.5	5°			
A16M-STUP□11-18E	1816B-11EH	●	●	18	16	15	150	27	–	–	9	0.7	4°			
A16M-STUP□11-20E	2016B-11EH	●	●	20	16	15	150	27	–	–	10	0.9	3°			
A20Q-STUP□11-25E	2520B-11EH	●	●	25	20	19	180	33	–	–	12.5	0.9	0°			
A20Q-STUP□16-25E	2520B-16EH	○	○	25	20	19	180	33	–	–	12.5	0.9	0°	0.8	SB-4TR	FT-15
A25R-STUP□16-32E	3225B-16EH	○	○	32	25	23.4	200	42	–	–	16	0.6	0°			
K10M-STUP□09-12H	–	●	●	12	10	9	150	19	27	125	6	0.3	8°	0.4	SB-2TR	FT-8
K12P-STUP□09-14H		●	●	14	12	11	170	22	31	143	7	0.4	6°			
K12P-STUP□09-16H		●	●	16	12	11	170	22	31	143	8	0.4	5°			
K16X-STUP□11-18H		●	●	18	16	15	210	25	35	187	9	0.5	4°	0.4	SB-3TR	FT-10
K16X-STUP□11-20H		●	●	20	16	15	210	25	35	187	10	0.5	3°			
K20X-STUP□11-25H		●	●	25	20	19	260	31	42	234	12.5	0.5	0°			
K25X-STUP□16-32H		●	●	32	25	24	320	38	49	292	16	0.5	0°	0.8	SB-4TR	FT-15

K···STUP-H Strong Bar

· Prefix "K" of the Description means Strong Mechanism.
· Do not clamp the part "L3" of the Toolholder, or the expected performance may not be obtained.
· Toolholder shank can be shorted to the Cut-off Limit Line.
· Cutting-off exceeding the Cut-off Limit Line means to cut the carbide core part, and it may deteriorate the Anti-Vibration performance.

● : Std. Stock ○ : Check Availability

Boring Bars [TP□□ Insert] — Screw Clamp

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	L4	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
E08L-STUP□08-10	STUP□1008B-08WH	●	○	10	8	7	140	10	–	–	5	0.4	10°	0.4	SB-1TR	FT-6
E10N-STUP□09-12	1210B-09WH	●	○	12	10	9	160	11	–	–	6	0.5	8°	0.4	SB-2TR	FT-8
E12Q-STUP□09-16	1612B-09WH	●	○	16	12	11	180	12	–	–	8	0.5	5°			
E10N-STUP□11-12	1210B-11WH	○	○	12	10	9	160	11	–	–	6	0.6	8°	0.4	SB-3TR	FT-10
E12Q-STUP□11-14	1412B-11WH	○	○	14	12	11	180	12	–	–	7	0.6	7°			
E12Q-STUP□11-16	1612B-11WH	●	○	16	12	11	180	12	–	–	8	0.5	5°			
E16X-STUP□11-18	1816B-11WH	●	○	18	16	15	220	14	–	–	9	0.7	4°			
E16X-STUP□11-20	2016B-11WH	○	○	20	16	15	220	14	–	–	10	0.9	3°			
E20S-STUP□11-25	2520B-11WH	○		25	20	19	250	17	–	–	12.5	0.9	0°			
E20S-STUP□16-25	2520B-16WH	○		25	20	19	250	17	–	–	12.5	0.9	0°	0.8	SB-4TR	FT-15

● Applicable Insert

Application	Minute ap	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Medium	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron
Ref. Page	62	63	63	64	64	64	64	63	63	65
Shape / Toolholder	CF	GP	HQ	□	□-FSF	□-H	□-USF	XP	XQ	No Chipbreaker
----STUP□08----	TPGT0802..	–	–	TPGH0802..	TPET0802..	–	TPET0802..	–	–	TPGB0802..
----STUP□09----	TPGT0902..	TPMT0902..	TPMT0902..	TPGH0902..	–	TPGH0902..	–	TPMT0902..	–	TPGB0902..
----STUP□11----	–	TPMT1103..	TPMT1103..	TPGH1103..	TPET1103..	TPGH1103..	TPET1103..	TPMT1103..	TPMT1103..	TPGB1103..
----STUP□16----	–	TPMT1603..	TPMT1603..	TPGH1603..	–	TPGH1603..	–	TPMT1603..	TPMT1603..	TPGB1603..

Application	Non-ferrous Metal	High Hard Mat'l
Ref. Page	460, 461	447
Shape / Toolholder	Diamond	CBN
----STUP□08----	TPMH0802.. TPGB0802..	TPGB0802..
----STUP□09----	TPMH0902.. TPGB0902..	TPGB0902..
----STUP□11----	TPMH1103.. TPGB1103..	TPGB1103..
----STUP□16----	TPMH1603.. TPGB1603..	TPGB1603..

● Applicable Coolant Sleeve/Joint

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A08H-STUP□08-10E	SHC0840-70 / SHC0850-95	SJS-5
A10X-STUP□09-12E	SHC1040-70 / SHC1050-95	
A12M-STUP□09-16E	SHC1240-70 / SHC1250-95	SJS-6
A10X-STUP□11-12E	SHC1040-70 / SHC1050-95	SJS-5
A12X-STUP□11-14E A12M-STUP□11-16E	SHC1240-70 / SHC1250-95	SJS-6
A16M-STUP□11-18E A16M-STUP□11-20E	SHC1640-70 / SHC1650-95	SJS-8
A20Q-STUP□11-25E	SHC2040-70 / SHC2050-95	
A20Q-STUP□16-25E A25R-STUP□16-32E	SHC2540-70 / SHC2550-95	
K10M-STUP□09-12H	SHC1040-70 / SHC1050-95	-
K12P-STUP□09-14H K12P-STUP□09-16H	SHC1240-70 / SHC1250-95	-
K16X-STUP□11-18H K16X-STUP□11-20H	SHC1640-70 / SHC1650-95	-
K20X-STUP□11-25H	SHC2040-70 / SHC2050-95	
K25X-STUP□16-32H	SHC2540-70 / SHC2550-95	

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
E08L-STUP□08-10	SHC0840-70 / SHC0850-95	SJS-5
E10N-STUP□09-12	SHC1040-70 / SHC1050-95	
E12Q-STUP□09-16	SHC1240-70 / SHC1250-95	SJS-6
E10N-STUP□11-12	SHC1040-70 / SHC1050-95	SJS-5
E12Q-STUP□11-14 E12Q-STUP□11-16	SHC1240-70 / SHC1250-95	SJS-6
E16X-STUP□11-18 E16X-STUP□11-20	SHC1640-70 / SHC1650-95	SJS-8
E20S-STUP□11-25	SHC2040-70 / SHC2050-95	
E20S-STUP□16-25		

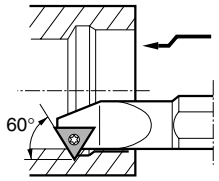
● See Page 166 for Details of the Coolant Sleeve / Joint

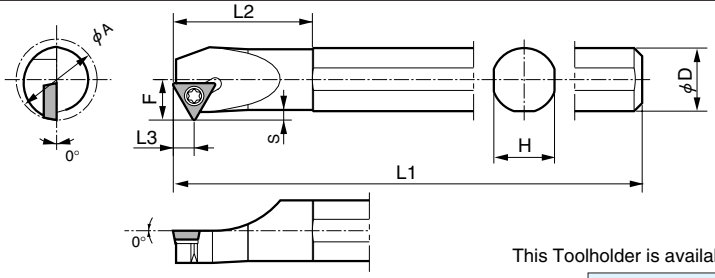
● : Std. Stock ○ : Check Availability

Boring Bars [TP□□ Insert] Screw Clamp

■ S···STWP Steel Bar (Copying)

Max. Overhang Length L/D=~3



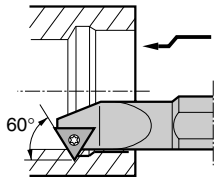


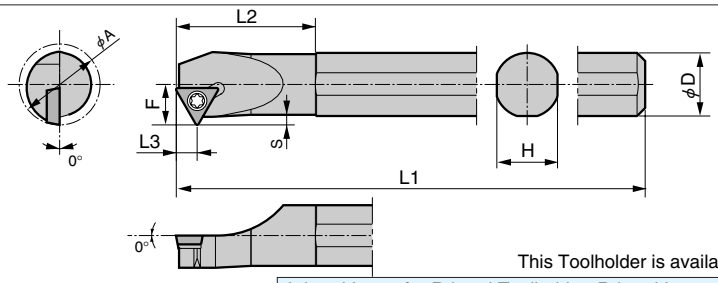
● Right-hand Shown

(Ref. Page.272)
This Toolholder is available for Threading, too
L-hand Insert for R-hand Toolholder

■ S···STWP-E Excellent Bar (Copying)

Max. Overhang Length L/D=~5





● Right-hand Shown

(Ref. Page272)
This Toolholder is available for Threading, too
L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S10M-STWPR/L11-12	SITR/L 1210-11	●		12	10	9.2	150	23	5.5	6	1.0	0°	0.1	SB-3STR	FT-10
S12M-STWPR/L11-16	1612-11	●		16	12	11	150	30	5.5	8	1.5	0°			
S16Q-STWPR/L11-20	2016-11	●		20	16	15	180	35	5.5	10	2.0	0°		SB-3TR	
S20R-STWPR/L11-25	2520-11	●		25	20	19	200	40	5.5	12.5	2.5	0°			
S10M-STWPR/L11-12E	–	○	○	12	10	9.2	150	23	5.5	6	1.0	0°	0.1	SB-3STR	FT-10
S12M-STWPR/L11-16E		○	○	16	12	11	150	30	5.5	8	1.5	0°			
S16R-STWPR/L11-20E		○	○	20	16	15	200	35	5.5	10	2.0	0°		SB-3TR	
S20X-STWPR/L11-25E		○	○	25	20	19	220	40	5.5	12.5	2.5	0°			
S20X-STWPR/L16-25E		○	○	25	20	19	220	40	7.7	14	4.0	0°	0.8	SB-4TR	FT-15
S25X-STWPR/L16-32E		○	○	32	25	23	270	42	7.7	16.5	4.0	0°			

● Applicable Insert

Application	Finishing	Finishing-Medium	Finishing	Finishing/Precision	Medium	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal
Ref. Page	63	63	64	64	64	64	63	63	65	460, 461
Shape / Toolholder	GP	HQ	R/L	R/L-FSF	R/L-H	FR/L-USF	XP	XQ	No Chipbreaker	Diamond
····STWPR/L11-12	–	–	TPGH1102..	–	–	–	–	–	TPGB1102..	–
····STWPR/L11····	TPMT1103..	TPMT1103..	TPGH1103..	TPET1103..	TPGH1103..	TPET1103..	TPMT1103..	TPMT1103..	TPGB1103..	TPMH1103.. TPGB1103..
····STWPR/L16····	TPMT1603..	TPMT1603..	TPGH1603..	–	TPGH1603..	–	TPMT1603..	TPMT1603..	TPGB1603..	TPMH1603.. TPGB1603..

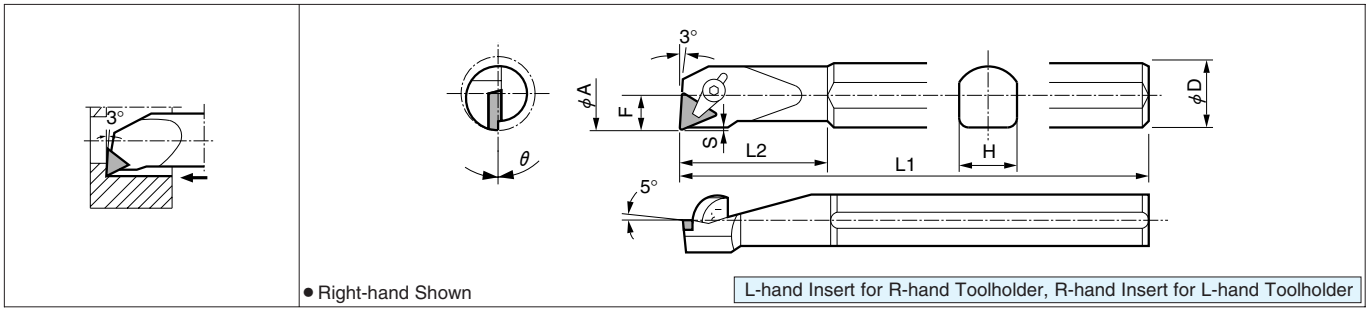
Application	High Hard Mat'l
Ref. Page	447
Shape / Toolholder	CBN
····STWPR/L11-12	–
····STWPR/L11····	TPGB1103..
····STWPR/L16····	TPGB1603..

● : Std. Stock ○ : Check Availability

Boring Bars [TP□□ Insert] Top Clamp

■ S···CTUP Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Clamp Set		Wrench		Shim	Shim Screw
S12L-CTUPR/L09-16	CTUPR/L 1612B-09	○	○	16	12	11	140	32	8	0.5	0°	0.4	CPS-1	-	FH-2	-	-	-
S16N-CTUPR/L11-20	2016B-11	●	●	20	16	14	160	30	10	0.5	0°	0.4	-	CPS-2	FH-2.5	-	-	-
S20Q-CTUPR/L11-27	2720B-11	●	○	27	20	18	180	40	13.5	1.3	0°							
S25X-CTUPR/L16-34	3425B-16	●	●	34	25	23	220	70	17	1.0	0°	0.8	-	CPS-3	-	LW-3	-	-
S32S-CTUPR/L16-43	4332B-16	●	●	43	32	30	250	80	21.5	1.0	0°						KPT-32	SP3X10
S40X-CTUPR/L16-50	5040B-16	○	○	50	40	37	315	80	25	1.0	0°							

● Applicable Insert

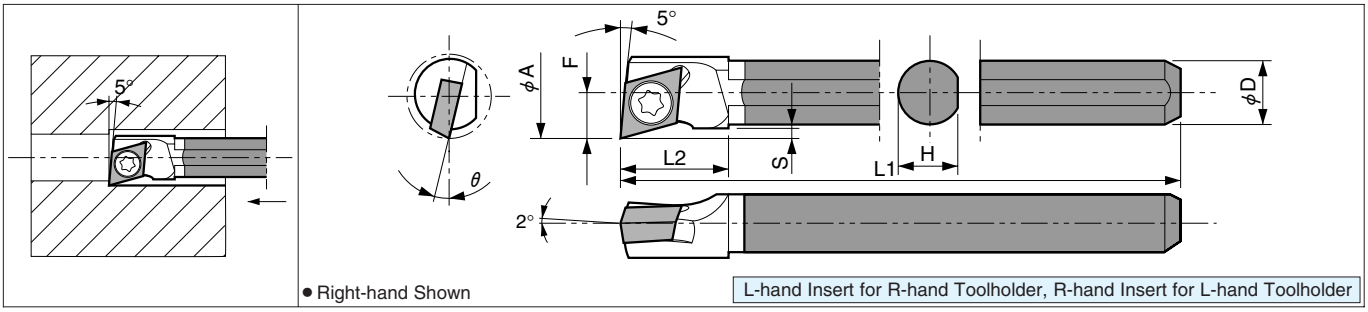
Application	Finishing	Finishing-Medium	Medium	Medium	Finishing	Finishing-Medium	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	66	66	66	66	67	67	67	86	462	448
Shape / Toolholder	GP	HQ	G	Conventional	R/L-F	R/L-□	No Chipbreaker	Ceramic	Diamond	CBN
····CTUPR/L09····	–	–	TPMR0902..	–	TPGR0902.	–	TPGN0902..	–	TPGN0902..	–
····CTUPR/L11····	TPMR1103..	TPMR1103..	TPMR1103..	TPMR1103..	–	TPGR1103..	TPMN1103.. TPGN1103..	TPGN1103..	TPGN1103..	TPGN1103..
····CTUPR/L16····	TPMR1603..	TPMR1603..	TPMR1603..	TPMR1603..	–	TPGR1603..	TPMN1603.. TPGN1603..	TPGN1603..	TPGN1603..	TPGN1603..

● : Std. Stock ○ : Check Availability

Boring Bars [JC□□ Insert] — Screw Clamp

■ C···SJLC Carbide Shank Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~7

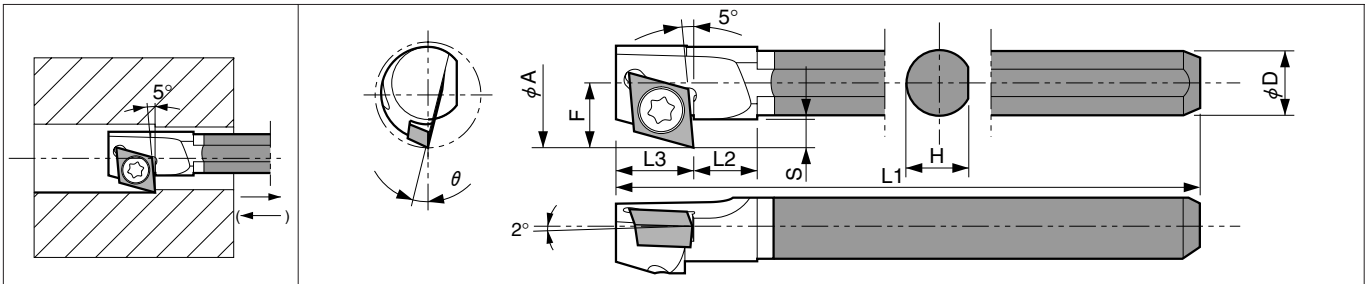


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SJZC Carbide Shank Bar (Back Boring)

Max. Overhang Length L/D=~7



● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

※ When using R-hand Toolholder, use R-hand insert for the machining direction (→)
use L-hand insert for the machining direction(←).

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
C04X-SJLC[R/L]03-055	SJLC[R/L] 05504B-03W	●	●	5.5	4	3.8	91	7	-	2.95	0.65	15°	0.03	SB-1630TR	FT-6
C04X-SJZC[R/L]03-065	SJZC[R/L] 06504B-03W	●	●	6.5	4	3.8	93	4	4.8	4.0	1.8	15°	0.03	SB-1630TR	FT-6

● Applicable Insert

Application	Finishing	Finishing/Precision	High Hard Mat'l
Ref. Page	68	68	448
Shape / Toolholder	[R/L]-F	[R/L]-FSF	CBN
----SJLC[R/L]03----	JCGT0301..	JCET0301..	JCGW0301..
----SJZC[R/L]03----	JCGT0301..	JCET0301..	JCGW0301..

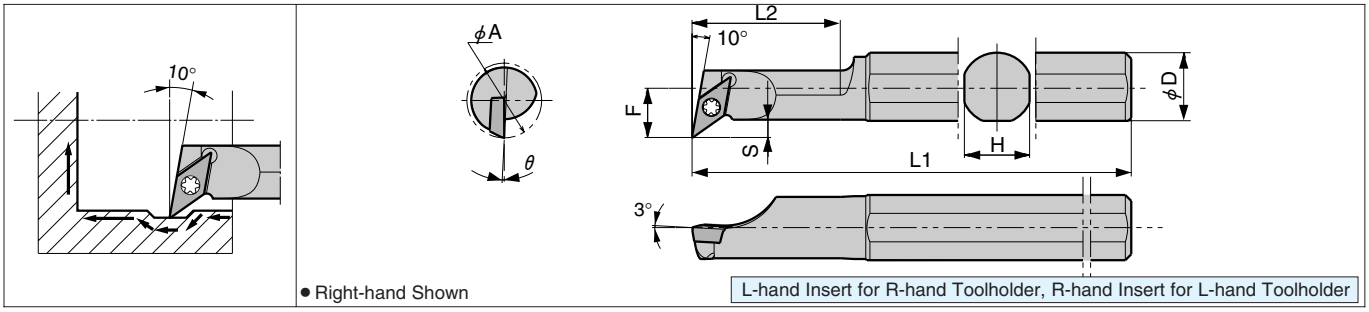
● : Std. Stock ○ : Check Availability

Boring Bars [YP□□ Insert]

Screw Clamp

■ A···SYXP-E Excellent Bar (Boring/Internal Facing/Copying)

Max. Overhang Length L/D=～5



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S12M-SYXPR/L06-12E	-	○	○	12	12	11	150	25	8.3	3	3°	0.2	SB-2040TR	FT-6
S16Q-SYXPR/L06-16E		○	○	16	16	15	180	30	10	3			SB-2045TR	FT-6

● Applicable Insert

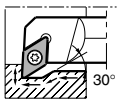
Application	Finishing	Low Feed
Ref. Page	68	68
Shape / Toolholder	R/L-F	FR/L-U
····SYXPR/L06····	YPGT0602..	YPGT0602..

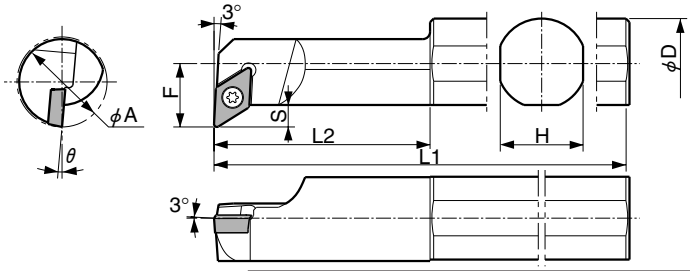
● : Std. Stock ○ : Check Availability

Boring Bars [DC□□ Insert]

■ S···SDUC Steel Bar (Copying)

Max. Overhang Length L/D=~3



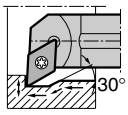


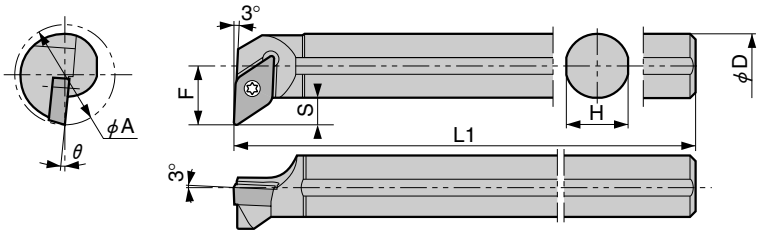
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SDUC-E Excellent Bar (Copying)

Max. Overhang Length L/D=~5



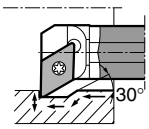


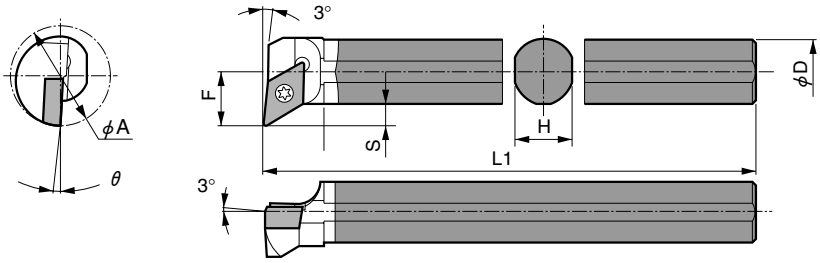
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SDUC Carbide Shank Bar (Copying)

Max. Overhang Length L/D=~7



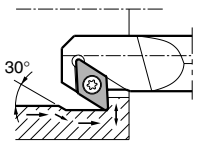


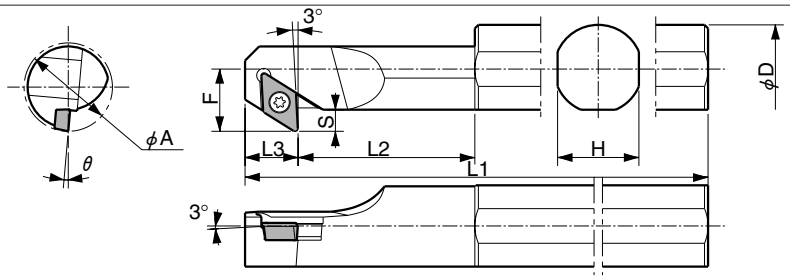
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ C···SDZC Steel Bar (Back Boring)

Max. Overhang Length L/D=~3



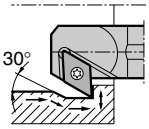


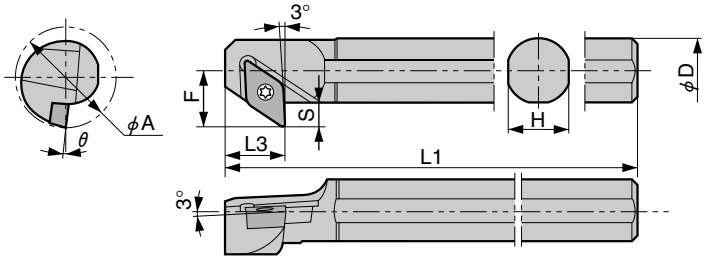
● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ C···SDZC-E Excellent Bar (Back Boring)

Max. Overhang Length L/D=~5





● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S16Q-SDUC□07-14	SDUC□ 1416B-07	●	●	14	16	14	180	30	-	10.4	4.4	5°	0.4	SB-2560TR	FT-8
S16Q-SDUC□07-16	1616B-07	●	●	16	16	14	180	35	-	11.4	4.4	5°			
S20R-SDUC□11-20	2020B-11	●	●	20	20	18	200	50	-	15.1	6.1	5°	0.8	SB-4085TR	FT-15
S25X-SDUC□11-25	2525B-11	●	●	25	25	23	220	60	-	17.6	6.1	5°			
S10M-SDUC□07-14E	SDUC□ 1410B-07E	●	●	14	10	9	150	-	-	8.3	3.3	5°	0.4	SB-2560TR	FT-8
S12M-SDUC□07-16E	1612B-07E	●	●	16	12	11	150	-	-	9.3	3.3	5°			
S16Q-SDUC□07-20E	2016B-07E	●	●	20	16	15	180	-	-	11.3	3.3	5°			
S16Q-SDUC□11-25E	2516B-11E	●	●	25	16	15	180	-	-	14.1	6.1	5°	0.8	SB-4085TR	FT-15
S20Q-SDUC□11-32E	3220B-11E	●	●	32	20	19	180	-	-	16.1	6.1	5°			
C10N-SDUC□07-14	SDUC□ 1410B-07W	○	○	14	10	9	160	-	-	8.2	3.3	5°	0.4	SB-2560TR	FT-8
C12Q-SDUC□07-16	1612B-07W	●	○	16	12	11	180	-	-	9.2	3.3	5°			
C12Q-SDUC□11-20	2012B-11W	○	○	20	12	11	180	-	-	12.3	6.1	5°	0.8	SB-4085TR	FT-15
C16X-SDUC□11-25	2516B-11W	●	○	25	16	15	220	-	-	14.3	6.1	5°			
C20S-SDUC□11-32	3220B-11W	○	○	32	20	19	250	-	-	16.3	6.1	5°			
S16Q-SDZC□07-14	SDZC□ 1416B-07	●	●	14	16	14	180	30	10	10.4	4.4	5°	0.4	SB-2560TR	FT-8
S16Q-SDZC□07-16	1616B-07	●	●	16	16	14	180	35	12.5	11.4	4.4	5°			
S20R-SDZC□11-20	2020B-11	●	●	20	20	18	200	40	15	15.1	6.1	5°	0.8	SB-4085TR	FT-15
S25X-SDZC□11-25	2525B-11	●	●	25	25	23	220	50	15	17.6	6.1	5°			
S10M-SDZC□07-14E	SDZC□ 1410B-07E	●	○	14	10	9	150	-	9.5	8.3	3.3	5°	0.4	SB-2560TR	FT-8
S12M-SDZC□07-16E	1612B-07E	●	○	16	12	11	150	-	10.5	9.3	3.3	5°			
S16Q-SDZC□07-20E	2016B-07E	●	○	20	16	15	180	-	10.5	11.3	3.3	5°			
S16Q-SDZC□11-25E	2516B-11E	○	○	25	16	15	180	-	15	14.1	6.1	5°	0.8	SB-4085TR	FT-15
S20Q-SDZC□11-32E	3220B-11E	○	○	32	20	19	180	-	15	16.1	6.1	5°			

● Applicable Insert

Application	Minute ap	Finishing	Finishing-Medium	Medium	Medium	Medium	Finishing	Finishing/Precision	Finishing-Medium	Finishing-Medium
Ref. Page	69	69	69	70	70	70	70	70	71	71
Shape / Toolholder	CF	GP	HQ	Conventional	GK	HF	□-F	□-FSF	□-FS	(E/F)N-Z
----SDUC□07----	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCGT0702..	DCGT0702..
----SDUC□11----	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCGT11T3..	DCGT11T3..
----SDZC□07----	DCGT0702..	DCMT0702..	DCMT0702..	DCGT0702..	DCMT0702..	-	DCGT0702..	DCET0702..	DCMT0702..	DCMT0702..
----SDZC□11----	DCGT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3.. DCMT11T3..	DCMT11T3..	DCMT11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..

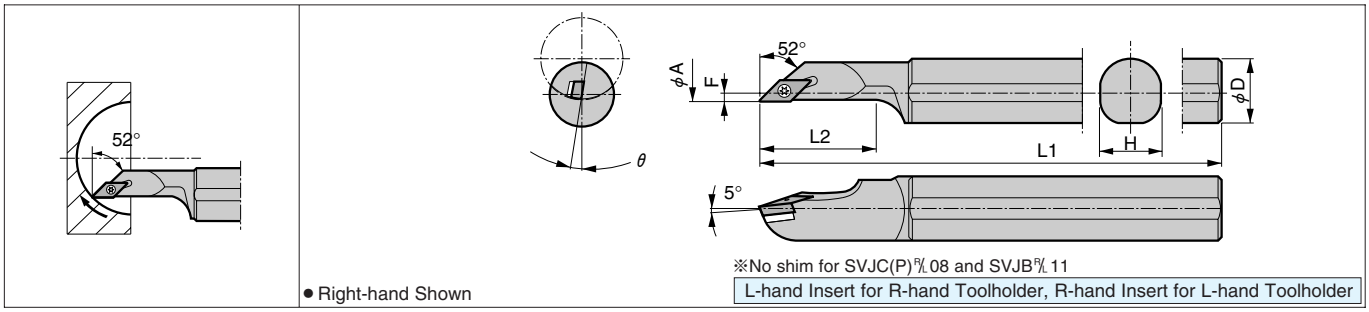
Application	Low Feed	Low Feed/Precision	Low Feed	Low Feed/Precision	Soft Steel	Soft Steel	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal
Ref. Page	71	71	71	71	70	70	72	70	72	462
Shape / Toolholder	(E/F)□-U	F□-USF	(E/F)□-J	F□-JSF	XP	XQ	No Chipbreaker	AH	□-A3	Diamond
----SDUC□07----	DCGT0702..	DCET0702..	–	–	DCMT0702..	–	DCGW0702..	–	DCGT0702..	DCMT0702..
----SDUC□11----	DCGT11T3..	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..
----SDZC□07----	DCGT0702..	DCET0702..	–	–	DCMT0702..	–	DCGW0702..	–	DCGT0702..	DCMT0702..
----SDZC□11----	DCGT11T3..	DCET11T3..	DCGT11T3..	DCET11T3..	DCMT11T3..	DCMT11T3..	DCGW11T3..	DCGT11T3..	DCGT11T3..	DCMT11T3..

Application	High Hard Mat'l
Ref. Page	448, 449
Shape / Toolholder	CBN
----SDUC□07----	DCMW0702..
----SDUC□11----	DCMW11T3..
----SDZC□07----	DCMW0702..
----SDZC□11----	DCMW11T3..

● : Std. Stock ○ : Check Availability

■ S···SVJB(C)-E
S···SVJP-E Excellent Bar (Internal Spherical Machining/Internal Facing)

Max. Overhang Length L/D=~5



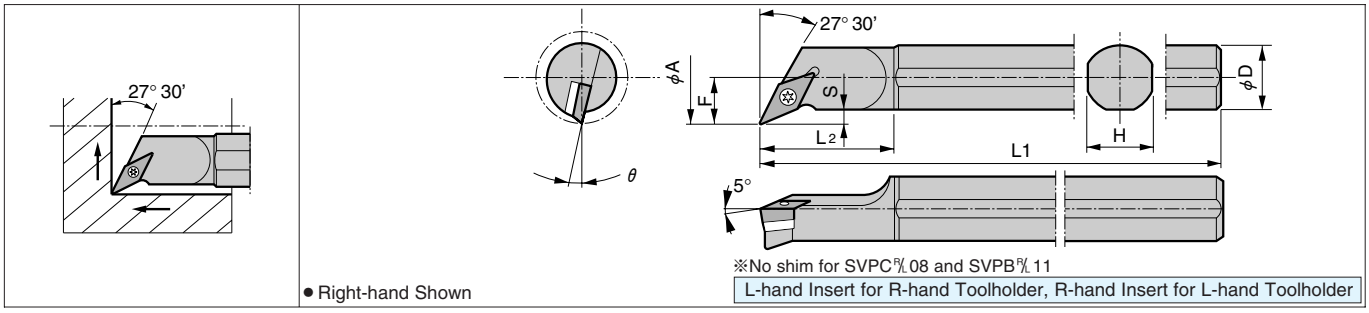
※No shim for SVJC(P)R/L 08 and SVJBR/L 11

● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SVPB(C)-E Excellent Bar (Copying/Undercutting)

Max. Overhang Length L/D=~5



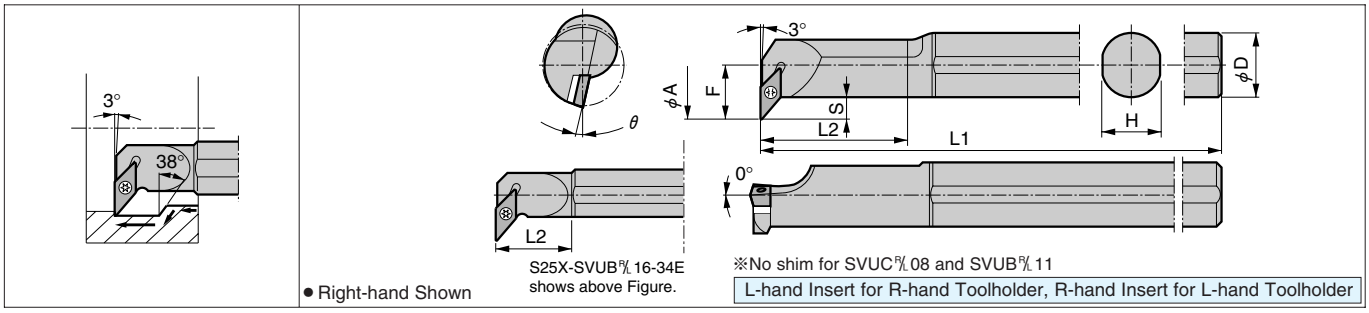
※No shim for SVPCR/L 08 and SVPBR/L 11

● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SVUB(C)-E Excellent Bar (Copying)

Max. Overhang Length L/D=~5



S25X-SVUBR/L 16-34E shows above Figure.

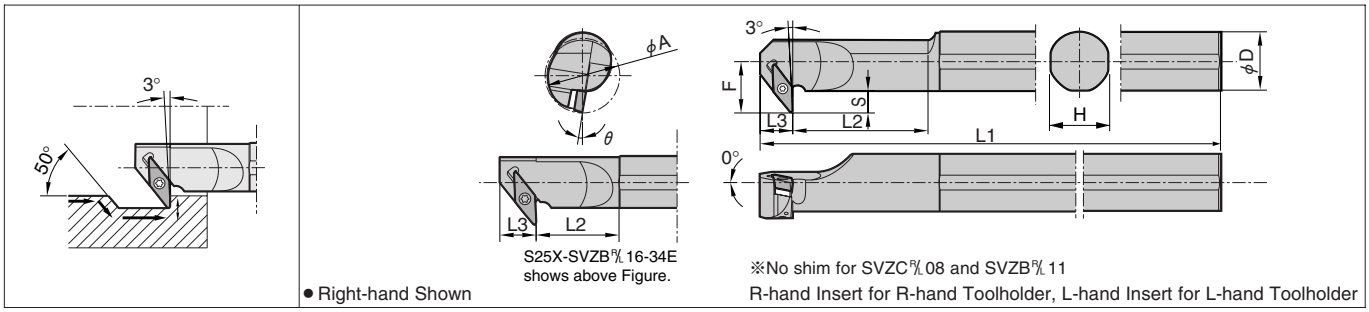
※No shim for SVUCR/L 08 and SVUBR/L 11

● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···SVZB(C)-E Excellent Bar (Back Boring)

Max. Overhang Length L/D=~5



S25X-SVZBR/L 16-34E shows above Figure.

※No shim for SVZCR/L 08 and SVZBR/L 11

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Right-hand Shown

● Toolholder Dimension

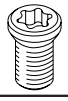
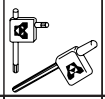
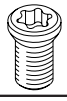
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	θ	Std. Corner-R
S12M-SVJCR/L 08-16E	SVJCR/L 1612B-08E	●	●	16	12	11	150	26	-	2	-	5°	0.4
S16Q-SVJCR/L 08-20E	2016B-08E	●	●	20	16	15	180	36	-	2	-	5°	
S20R-SVJBR/L 11-25E	SVJBR/L 2520B-11E	●	●	25	20	19	200	37.5	-	2	-	5°	0.4
S25S-SVJBR/L 11-30E	3025B-11E	●	●	30	25	24	250	45	-	3.5	-	5°	
S32S-SVJBR/L 16-40E	4032B-16E	●	●	40	32	31	250	60	-	3.5	-	8°	0.8
S40T-SVJBR/L 16-50E	5040B-16E	●	●	50	40	39	300	75	-	4.5	-	7°	
S12M-SVJPR/L 08-16E	(SVJPR/L 1612B-08E)	●	●	16	12	11	150	26	-	2	-	5°	0.2

● : Std. Stock ○ : Check Availability

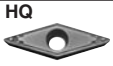
● Toolholder Dimension

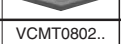
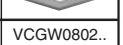
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	φD	H	L1	L2	L3	F	S	θ	Std. Corner-R
S10M-SVPCR/L08-16E	SVQCR/L 1610B-08E	●	●	16	10	9	150	25	-	8	3	8°	0.4
S12M-SVPBR/L11-20E	SVQBR/L 2012B-11E	●	●	20	12	10.6	150	28	-	10	4.5	8°	0.4
S16Q-SVPBR/L11-25E	2516B-11E	●	○	25	16	14.6	180	28	-	12.5	5	5°	
S25X-SVPBR/L16-34E	3425B-16E	●	●	34	25	23.6	220	50	-	17	5	13°	0.8
S32S-SVPBR/L16-40E	4032B-16E	●	●	40	32	30.6	250	55	-	22	6.5	9°	
S12M-SVUCR/L08-16E	SVUCR/L 1612B-08E	●	●	16	12	11	150	25.5	-	11	5.5	8°	0.4
S16Q-SVUBR/L11-20E	SVUBR/L 2016B-11E	●	●	20	16	14.6	180	32.5	-	15.5	8	8°	0.4
S20R-SVUBR/L11-25E	2520B-11E	●	●	25	20	18.6	200	40.5	-	17.5	8	7°	
S25X-SVUBR/L16-34E	3425B-16E	●	●	34	25	23.6	220	40	-	20.5	8.5	13°	0.8
S32S-SVUBR/L16-40E	4032B-16E	●	●	40	32	30.6	250	84	-	27.5	12	9°	
S12M-SVZCR/L08-16E	—	○	○	16	12	11	150	25.5	7.5	11	5.5	8°	0.4
S16Q-SVZBR/L11-20E		●	●	20	16	15	180	32.5	10	15.5	8	8°	0.4
S20R-SVZBR/L11-25E		○	○	25	20	19	200	40.5	10	17.5	8	7°	
S25X-SVZBR/L16-34E		○	○	34	25	24	220	40	17.5	20.5	8.5	13°	0.8
S32S-SVZBR/L16-40E		●	●	40	32	31	250	72.5	17.5	27.5	12	9°	

● Spare Parts

Description	Spare Parts: Clamp Screw	Wrench	Shim	Shim Screw	Wrench
					
S12M-SVJCR/L08-16E S16Q-SVJCR/L08-20E	SB-2050TR	FT-6	-	-	-
S20R-SVJBR/L11-25E S25S-SVJBR/L11-30E	SB-2570TR	FT-8	-	-	-
S32S-SVJBR/L16-40E S40T-SVJBR/L16-50E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S12M-SVJPR/L08-16E	SB-2050TR	FT-6	-	-	-
S10M-SVPCR/L08-16E	SB-2050TR	FT-6	-	-	-
S12M-SVPBR/L11-20E S16Q-SVPBR/L11-25E	SB-2570TR	FT-8	-	-	-
S25X-SVPBR/L16-34E S32S-SVPBR/L16-40E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S12M-SVUCR/L08-16E	SB-2050TR	FT-6	-	-	-
S16Q-SVUBR/L11-20E S20R-SVUBR/L11-25E	SB-2570TR	FT-8	-	-	-
S25X-SVUBR/L16-34E S32S-SVUBR/L16-40E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S12M-SVZCR/L08-16E	SB-2050TR	FT-6	-	-	-
S16Q-SVZBR/L11-20E S20R-SVZBR/L11-25E	SB-2570TR	FT-8	-	-	-
S25X-SVZBR/L16-34E S32S-SVZBR/L16-40E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6

● Applicable Insert

Application	Finishing	Finishing-Medium
Ref. Page	73	73
Shape / Toolholder	GP 	HQ 
...-SVJCR/L08-...	–	VCMT0802..
...-SVJPR/L08-...	–	–
...-SVJBR/L11-...	VBMT1103..	VBMT1103.. VCMT1103..
...-SVJBR/L16-...	VBMT1604..	VBMT1604.. VCMT1604..
...-SVPCR/L08-...	–	VCMT0802..
...-SVPBR/L11-...	VBMT1103..	VBMT1103.. VCMT1103..
...-SVPBR/L16-...	VBMT1604..	VBMT1604.. VCMT1604..
...-SVUCR/L08-...	–	VCMT0802..
...-SVUBR/L11-...	VBMT1103..	VBMT1103.. VCMT1103..
...-SVUBR/L16-...	VBMT1604..	VBMT1604.. VCMT1604..
...-SVZCR/L08-...	–	VCMT0802..
...-SVZBR/L11-...	VBMT1103..	VBMT1103.. VCMT1103..
...-SVZBR/L16-...	VBMT1604..	VBMT1604.. VCMT1604..

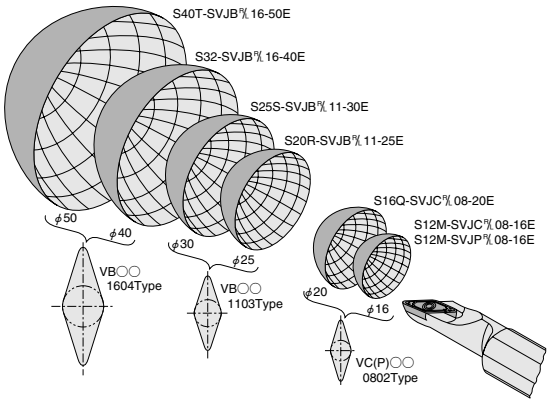
Application	Finishing	Finishing/Precision	Finishing-Medium	Medium	Low Feed/Precision	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l
Ref. Page	74	74	74	74	74	73	73	74	462	449
Shape / Toolholder	R/L-F 	R/L-FSF 	R/L-Y 	(E/F)N-Z 	F R/L-USF 	AH 	Without Indication 	R/L-A3 	Diamond 	CBN 
...-SVJCR/L08-...	–	–	–	–	–	–	–	–	VCMT0802..	VCGW0802..
...-SVJPR/L08-...	–	VPET0802..	–	–	VPET0802..	–	–	–	–	–
...-SVJBR/L11-...	VBGT1103..	VBET1103..	VBMT1103.. VCMT1103..	VBGT1103.. VCGT1103..	–	–	–	–	VBMT1103..	VBGW1103..
...-SVJBR/L16-...	–	–	VBMT1604.. VCMT1604..	–	–	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..
...-SVPCR/L08-...	–	–	–	–	–	–	–	–	VCMT0802..	VCGW0802..
...-SVPBR/L11-...	VBGT1103..	VBET1103..	VBMT1103.. VCMT1103..	VBGT1103.. VCGT1103..	–	–	–	–	VBMT1103..	VBGW1103..
...-SVPBR/L16-...	–	–	VBMT1604.. VCMT1604..	–	–	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..
...-SVUCR/L08-...	–	–	–	–	–	–	–	–	VCMT0802..	VCGW0802..
...-SVUBR/L11-...	VBGT1103..	VBET1103..	VBMT1103.. VCMT1103..	VBGT1103.. VCGT1103..	–	–	–	–	VBMT1103..	VBGW1103..
...-SVUBR/L16-...	–	–	VBMT1604.. VCMT1604..	–	–	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..
...-SVZCR/L08-...	–	–	–	–	–	–	–	–	VCMT0802..	VCGW0802..
...-SVZBR/L11-...	VBGT1103..	VBET1103..	VBMT1103.. VCMT1103..	VBGT1103.. VCGT1103..	–	–	–	–	VBMT1103..	VBGW1103..
...-SVZBR/L16-...	–	–	VBMT1604.. VCMT1604..	–	–	VCGT1604..	VCGT1604..	VCGT1604..	VBMT1604. VCMW1604..	VBGW1604.. VBMW1604.. VCGW1604..

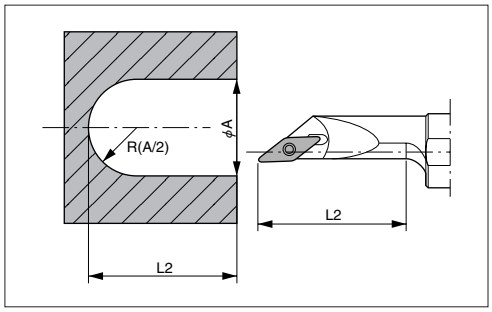
● : Std. Stock ○ : Check Availability

Boring Bars [VB□□/VC□□, VP□□ Insert] Screw Clamp

◆ Application of S···SVJB(C)-E / S-SVJP-E

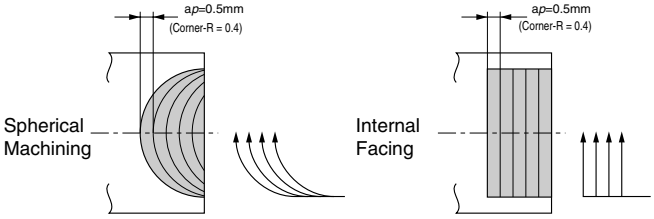
1. Application Range





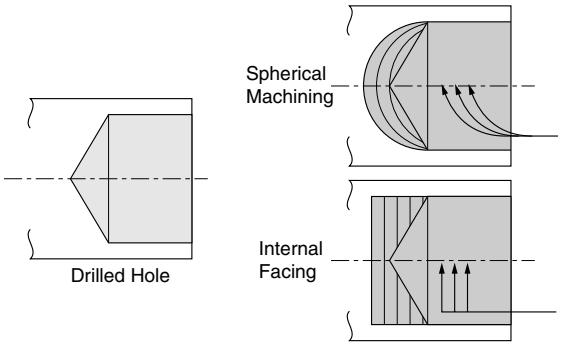
2. Machining Method

Case with No Preboring



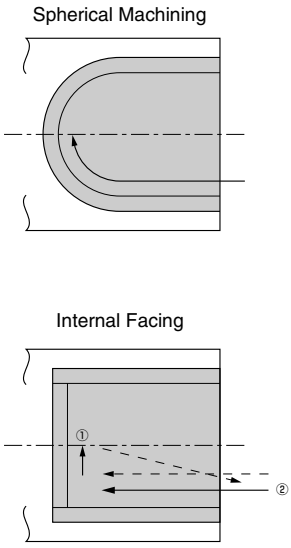
(Note) f shall be under 0.05mm/rev at internal facing.

Case with Drilled Hole



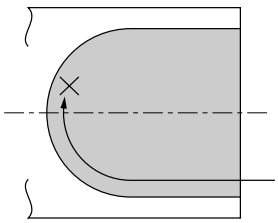
(Note) f shall be under 0.05mm/rev at internal facing.

Finishing

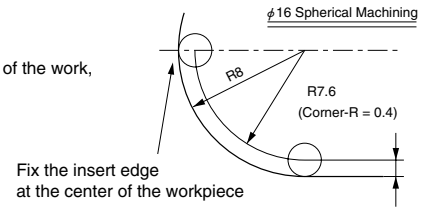


Machining Process
①Finish the internal face firstly.
②Next, finish the internal diameter.

3. Caution in Machining

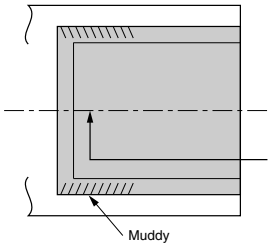


When machining exceeding the center of the work, the insert breakage may occur.



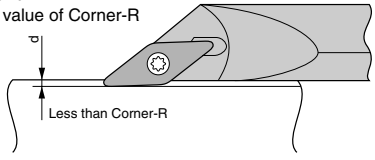
Fix the insert edge at the center of the workpiece

Adjust the machining program of radius smaller by corner-R value.



The machining of this kind is available, but the obligue part may be scratched by chips.

For Internal Profiling, a*p* "d" should be less than the value of Corner-R



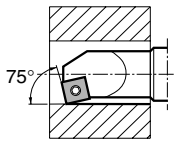
Burr occurs, if a*p* "d" is bigger than Corner-R.

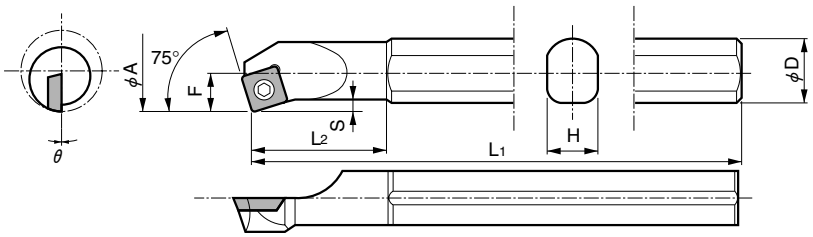
Boring Bars [SP□□ Insert]

Screw Clamp / Top Clamp

■ S···SSKP Steel Bar (Thru Boring)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder

● Toolholder Dimension

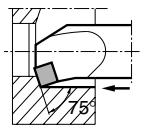
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Clamp Screw	Spare Parts: Wrench
S16Q-SSKP R/L 09-20	SSKP R/L 2016B-09	●		20	16	14	180	30	10	2.0	-3°	0.8	SB-4TR	FT-15
S20R-SSKP R/L 09-25	2520B-09	○		25	20	18	200	35	12.5	2.5	0°			
S25X-SSKP R/L 12-32	3225B-12	○		32	25	23	220	45	16	3.5	0°	0.8	GS-50S	LW-3
S32S-SSKP R/L 12-40	4032B-12	○		40	32	30	250	60	20	4.0	0°		GS-50	

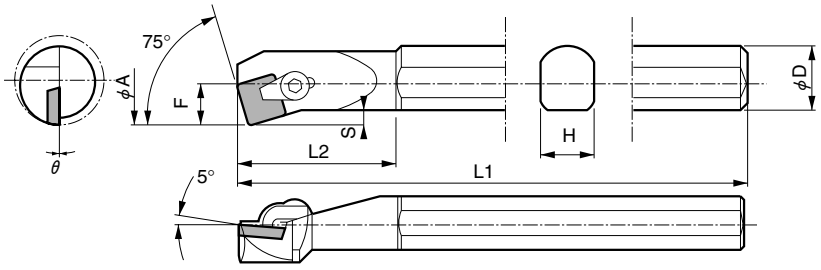
● Applicable Insert

Application	Finishing
Ref. Page	75
Shape / Toolholder	R/L 
····SSKP R/L 09···	SPGH0903..
····SSKP R/L 12···	SPGH1203..

■ S···CSKP Steel Bar (Thru Boring)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Clamp Set	Spare Parts: Wrench		Spare Parts: Shim	Spare Parts: Shim Screw
S16N-CSKP R/L 09-20	CSKP R/L 2016B-09	●		20	16	14	160	40	10	2.0	0°	0.8	CPS-2	FH-2.5	-	-	-
S20Q-CSKP R/L 09-27	2720B-09	●		27	20	18	180	45	13.5	3.5	0°						
S25X-CSKP R/L 12-34	3425B-12	●		34	25	23	220	60	17	4.5	0°	0.8	CPS-3	-	LW-3	-	-
S32S-CSKP R/L 12-43	4332B-12	●	●	43	32	30	250	75	21.5	5.5	0°					KPS-42	SP3X10

● Applicable Insert

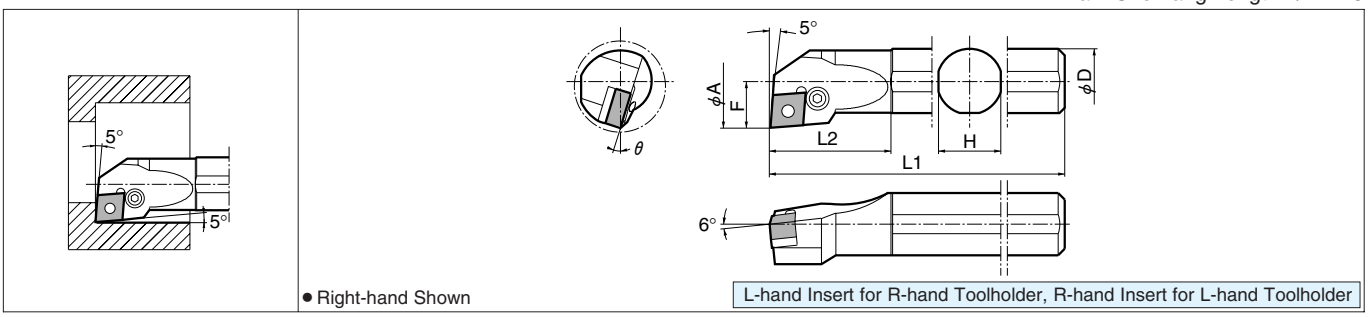
Application	Medium	Medium	Finishing-Medium	Cast Iron	Cast Iron	Non-ferrous Metal	High Hard Mat'l
Ref. Page	76	76	76	76	86	462	449
Shape / Toolholder	G 	Conventional 	R/L 	No Chipbreaker 	Ceramic 	Diamond 	CBN 
····CSKP R/L 09···	SPMR0903..	SPMR0903..	SPGR0903..	SPMN0903.. SPGN0903..	SPGN0903..	–	SPGN0903..
····CSKP R/L 12···	SPMR1203..	SPMR1203..	SPGR1203..	SPMN1203.. SPGN1203..	SPGN1203..	SPGN1203..	SPGN1203..

● : Std. Stock ○ : Check Availability

Boring Bars [CN□□ Small Negative Insert] Lever Lock

■ S···PCLN09 Steel Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3

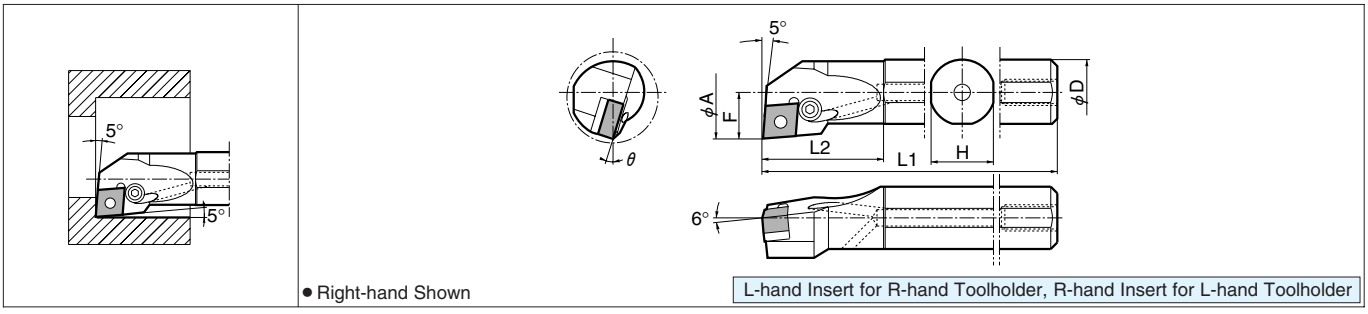


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ A···PCLN09 Steel Twin-Hole Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S16M-PCLNR/L09-20	PCLNR/L 2016B-09	○	○	20	16	15	150	34	11	16°		LL-03S	LS-03S	-	P-03S	-	
S20Q-PCLNR/L09-27	2720B-09	○	○	27	20	19	180	37	14.2	17°	0.8	LL-1	LS-1S	LC-32	LSP-1	PC-1	FH-2.5
S25R-PCLNR/L09-32	3225B-09	○	○	32	25	24	200	42	15.7	15°							
A16M-PCLNR/L09-20	PCLNR/L 2016B-09H	●	●	20	16	15	150	34	11	16°		LL-03S	LS-03S	-	P-03S	-	
A20Q-PCLNR/L09-27	2720B-09H	●	●	27	20	19	180	37	14.2	17°	0.8	LL-1	LS-1S	LC-32	LSP-1	PC-1	FH-2.5
A25R-PCLNR/L09-32	3225B-09H	●	●	32	25	24	200	42	15.7	15°							

● Applicable Insert

Application	Finishing	Finishing-Medium	Medium-Roughing	Finishing	Medium
Ref. Page	34	34	35	37	37
Shape / Toolholder	GP	HQ	GS	R/L-S	R/L
----PCLNR/L09----	CNMG0904..	CNMG0904..	CNMG0904..	CNGG0904..	CNGG0904..

● Applicable Coolant Sleeve/Joint

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A16M-PCLNR/L09-20	SHC1640-70,SHC1650-95	SJS-8
A20Q-PCLNR/L09-27	SHC2040-70,SHC2050-95	
A25R-PCLNR/L09-32	SHC2540-70,SHC2550-95	

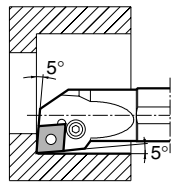
● See Page 166 for Details of the Coolant Sleeve / Joint

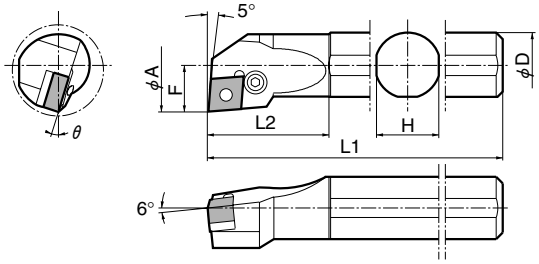
● : Std. Stock ○ : Check Availability

Boring Bars [CN□□ Negative Insert] Lever Lock

■ S···PCLN12 Steel Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S32S-PCLNR/L12-40	PCLNR/L 4032B-12	●	●	40	32	30	250	50	21	10°	0.8	LL-2	LS-2	LC-42R/L	LSP-2	PC-2	LW-3
S40T-PCLNR/L12-50	5040B-12	●	●	50	40	37	300	60	25	10°							

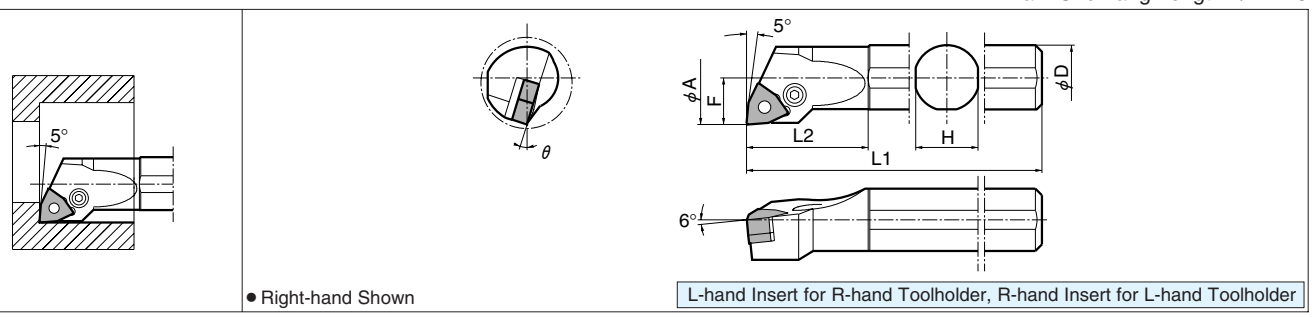
● Shim: LC-42R for R-hand Toolholder, LC-42L for L-hand Toolholder

● Applicable Insert

Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Ref. Page	34	34	35	35	35	35	35	35	35	36
Shape / Toolholder	GP	HQ	CQ	TK	WQ	GS	HS	CS	GT	Conventional
····PCLNR/L12····	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..
Application	Roughing	Medium	Medium-Roughing	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel	Stainless Steel	Cast Iron
Ref. Page	36	37	37	36	36	36	36	36	37	37
Shape / Toolholder	HX	R/L	R/L-25R	XP(-T)	XQ	XS	GU	SU	R/L-ST	ZS
····PCLNR/L12····	CNMM1204..	CNGG1204..	CNGG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..	CNMG1204..
Application	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l				
Ref. Page	37	82	37	37	459	442				
Shape / Toolholder	No Chipbreaker	Ceramic	AH	R/L-A3	Diamond	CBN				
····PCLNR/L12····	CNMA1204.. CNGA1204..	CNMA1204.. CNGA1204..	CNMG1204..	CNGG1204..	CNMM1204..	CNGA1204..				

■ S···PWLN06 Steel Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3

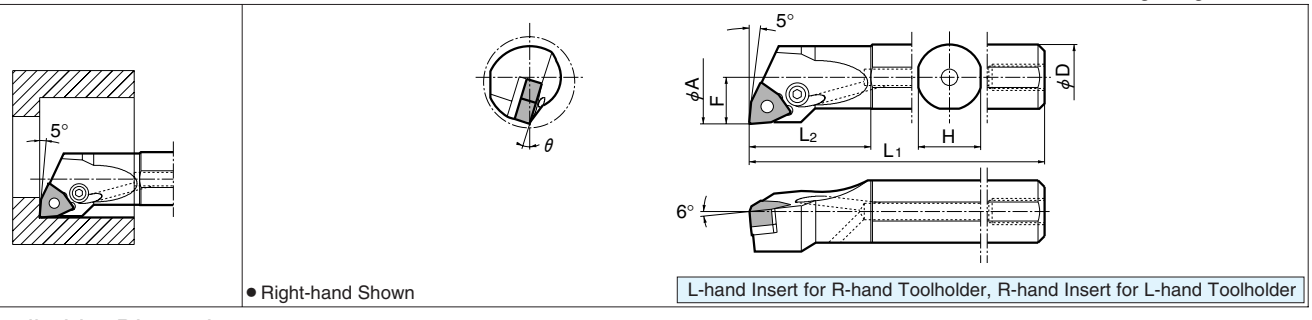


● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ A···PWLN06 Steel Twin-Hole Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S16M-PWLNR/L06-20	PWLNR/L2016B-06	○	○	20	16	15	150	34	11	16°		LL-03S	LS-03S	-	P-03S	-	
S20Q-PWLNR/L06-27	2720B-06	○	○	27	20	19	180	37	14.2	17°	0.8	LL-1	LS-1S	LW-32	LSP-1	PC-1	FH-2.5
S25R-PWLNR/L06-32	3225B-06	○	○	32	25	24	200	42	15.7	15°							
A16M-PWLNR/L06-20	PWLNR/L2016B-06H	●	●	20	16	15	150	34	11	16°		LL-03S	LS-03S	-	P-03S	-	
A20Q-PWLNR/L06-27	2720B-06H	●		27	20	19	180	37	14.2	17°	0.8	LL-1	LS-1S	LW-32	LSP-1	PC-1	FH-2.5
A25R-PWLNR/L06-32	3225B-06H	●		32	25	24	200	42	15.7	15°							

● Applicable Insert

Application	Finishing	Finishing-Medium	Medium-Roughing	Finishing	Medium
Ref. Page	38	38	39	40	40
Shape / Toolholder	GP	HQ	GS	R/L-S	R/L
----PWLNR/L06----	WNMG0604..	WNMG0604..	WNMG0604..	WNGG0604..	WNGG0604..

● Applicable Coolant Sleeve/Joint

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A16M-PWLNR/L06-20	SHC1640-70,SHC1650-95	SJS-8
A20Q-PWLNR/L06-27	SHC2040-70,SHC2050-95	
A25R-PWLNR/L06-32	SHC2540-70,SHC2550-95	

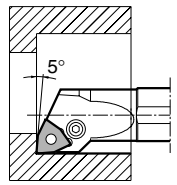
● See Page 166 for Details of the Coolant Sleeve / Joint

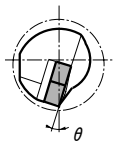
● : Std. Stock ○ : Check Availability

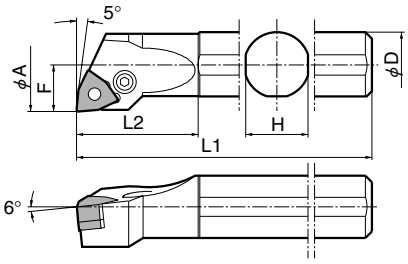
Boring Bars [WN□□ Negative Insert] Lever Lock

■ S···PWLN08 Steel Bar (Boring/Internal Facing)

Max. Overhang Length L/D=~3







● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S32S-PWLNR/L08-40	—	●	○	40	32	30	250	50	22	10°	0.8	LL-2	LS-2	LW-42R/L	LSP-2	PC-2	LW-3
S40T-PWLNR/L08-50		○	○	50	40	37	300	60	27								

● Applicable Insert

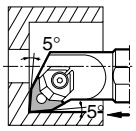
Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Ref. Page	38	38	38	38	38	39	39	39	39	39
Shape / Toolholder	GP	HQ	CQ	TK	WQ	GS	HS	CS	GT	Conventional
...-PWLNR/L08-...	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..
Application	Medium	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel	Cast Iron	Cast Iron	Cast Iron	Non-ferrous Metal
Ref. Page	40	39	39	39	39	40	40	40	83	40
Shape / Toolholder	ER/L	XP	XQ	XS	GU	SU	ZS	No Chipbreaker	Ceramic	AH
...-PWLNR/L08-...	WNMX0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMA0804..	WNGA0804..	WNMG0804..
Application	Non-ferrous Metal	High Hard Mat'l								
Ref. Page	459	442, 443								
Shape / Toolholder	Diamond	CBN								
...-PWLNR/L08-...	WNMM0804..	WNGA0804..								

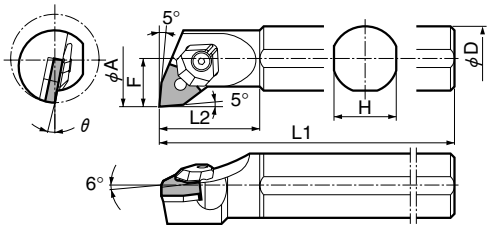
● : Std. Stock ○ : Check Availability

Boring Bars [WN□□ Negative Insert] Wedge Lock

■ S···WWLN08 Steel Bar (Boring/Facing)

Max. Overhang Length L/D=~3



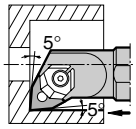


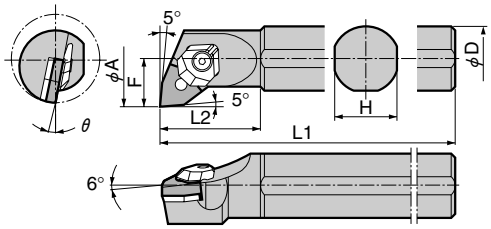
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ S···WWLN08-E Excellent Bar (Boring/Facing)

Max. Overhang Length L/D=~5





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Shim Pin	Wrench
S25S-WWLN[R/L]08-28				28	25	24	250	36	14	13°						
S25S-WWLN[R/L]08-34	–	●	●	34	25	24	250	40	17	11°	0.8	WCS-8	LW-3	WWP-42	WP5X11	LW-2
S32S-WWLN[R/L]08-40		●	●	40	32	30	250	50	20	10°						
S25S-WWLN[R/L]08-28E	WWLN[R/L] 2825B-08E	●	●	28	25	24	250	36	14	13°						
S25S-WWLN[R/L]08-34E	3425B-08E	○	○	34	25	24	250	40	17	11°	1.2	WCS-8	LW-3	WWP-42	WP5X11	LW-2
S32S-WWLN[R/L]08-40E	4032B-08E	○	○	40	32	30	250	50	20	10°						

● Applicable Insert

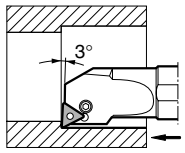
Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing
Ref. Page	38	38	38	38	38	39	39	39	39	39
Shape / Toolholder	GP	HQ	CQ	TK	WQ	GS	HS	CS	GT	Conventional
...-WWLN[R/L]08-...	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..
Application	Medium	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel	Cast Iron	Cast Iron	Non-ferrous Metal	Non-ferrous Metal
Ref. Page	40	39	39	39	39	40	40	40	40	459
Shape / Toolholder	E[R/L]	XP	XQ	XS	GU	SU	ZS	No Chipbreaker	AH	Diamond
...-WWLN[R/L]08-...	WNMX0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMG0804..	WNMA0804..	WNMG0804..	WNMM0804..
Application	High Hard Mat'l									
Ref. Page	442, 443									
Shape / Toolholder	CBN									
...-WWLN[R/L]08-...	WNGA0804..									

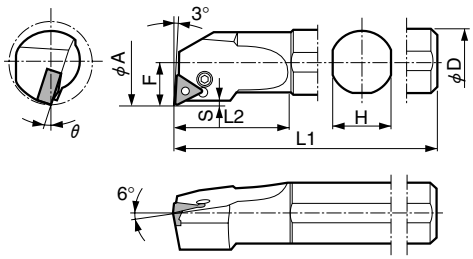
● : Std. Stock ○ : Check Availability

Boring Bars [TN□□ Small Negative Insert] Lever Lock

■ S···PTUN11 Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3



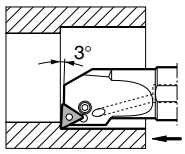


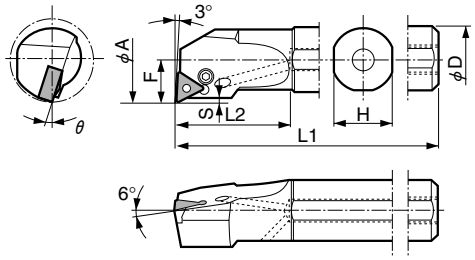
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ A···PTUN11 Steel Twin-Hole Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim Pin	Wrench
S16M-PTUN[R/L]11-20	PTUN[R/L] 2016B-11	○	○	20	16	15	150	34	11	0.3	18°					
S20Q-PTUN[R/L]11-25	2520B-11	○	○	25	20	19	180	37	13.2	0.2	17°	0.8	LL-03T	LS-03S	P-03S	FH-2.5
S25R-PTUN[R/L]11-32	3225B-11	○	○	32	25	24	200	42	15.7	0.3	16°					
A16M-PTUN[R/L]11-20	PTUN[R/L] 2016B-11H	●		20	16	15	150	34	11	0.3	18°					
A20Q-PTUN[R/L]11-25	2520B-11H	●		25	20	19	180	37	13.2	0.2	17°	0.8	LL-03T	LS-03S	P-03S	FH-2.5
A25R-PTUN[R/L]11-32	3225B-11H	●		32	25	24	200	42	15.7	0.3	16°					

● Applicable Insert

Application	Finishing	Finishing-Medium	Medium-Roughing	Finishing	Finishing-Medium
Ref. Page	41	41	42	44	44
Shape / Toolholder	GP	HQ	GS	[R/L]-S	[R/L]
...-PTUN[R/L]11-...	TNMG1104..	TNMG1104..	TNMG1104..	TNGG1104..	TNGG1104..

● Applicable Coolant Sleeve/Joint

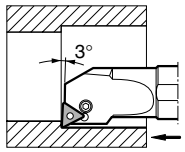
Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A16M-PTUN[R/L]11-20	SHC1640-70,SHC1650-95	SJS-8
A20Q-PTUN[R/L]11-25	SHC2040-70,SHC2050-95	
A25R-PTUN[R/L]11-32	SHC2540-70,SHC2550-95	

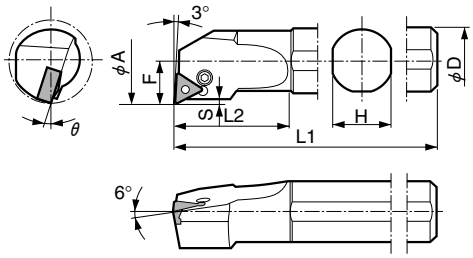
● See Page 166 for Details of the Coolant Sleeve / Joint

Boring Bars [TN□□ Negative Insert] Lever Lock

■ S···PTUN16 Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S25R-PTUNR/L16-30	—	●	●	30	25	24	200	42	15.5	1.5	13°		LL-03S	LS-03S	-	P-03S	-	FH-2.5
S32S-PTUNR/L16-40		○	○	40	32	30	250	50	22	2.0	13°	0.8	LL-1	LS-1	LT-32	LSP-1	PC-1	FH-2.5
S40T-PTUNR/L16-50		●	●	50	40	37	300	60	27	1.8	11°							

● Applicable Insert

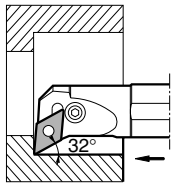
Application	Finishing	Finishing-Medium	Finishing-Medium	Finishing-Medium	Medium-Roughing	Medium-Roughing	Medium-Roughing	Medium-Roughing	Roughing	Finishing
Ref. Page	41	41	42	42	42	42	42	42	42	44
Shape / Toolholder	GP	HQ	CQ	TK	GS	HS	CS	GT	Conventional	R/L-S
····PTUNR/L16-····	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNGG1604..
Application	Medium-Roughing	Medium-Roughing	Soft Steel	Soft Steel	Soft Steel	Stainless Steel	Stainless Steel	Stainless Steel	Cast Iron	Cast Iron
Ref. Page	44	44	43	43	43	43	43	44	43	45
Shape / Toolholder	R/L-□	R/L-25R	XP(-T)	XQ	XS	GU	SU	R/L-ST	ZS	No Chipbreaker
····PTUNR/L16-····	TNGG1604..	TNGG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMG1604..	TNMA1604.. TNGA1604..
Application	Cast Iron	Non-ferrous Metal	Non-ferrous Metal	Non-ferrous Metal	High Hard Mat'l					
Ref. Page	83	43	45	459	443					
Shape / Toolholder	Ceramic	AH	R/L-A3	Diamond	CBN					
····PTUNR/L16-····	TNGA1604..	TNMG1604..	TNGG1604..	TNMM1604..	TNGA1604..					

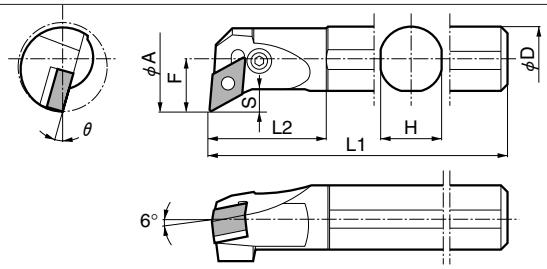
● : Std. Stock ○ : Check Availability

Boring Bars [DN□□ Small Negative Insert] Lever Lock

■ S···PDUN11 Steel Bar (Copying)

Max. Overhang Length L/D=~3



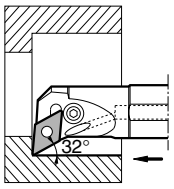


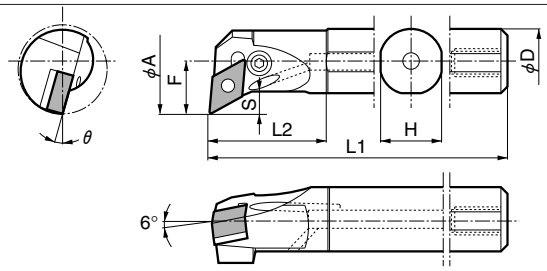
● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

■ A···PDUN11 Steel Twin-Hole Bar (Copying)

Max. Overhang Length L/D=~3





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	S	θ	Std. Corner-R	Spare Parts: Lever	Lock Screw	Shim	Shim Pin	Punch	Wrench
S20Q-PDUNR/L11-27	PDUNR/L 2720B-11	○	○	27	20	19	180	35	16	7.6	17°							
S25R-PDUNR/L11-32	3225B-11	○	○	32	25	24	200	40	17	7.6	15°	0.8	LL-1D	LS-1S	LD-32	LSP-1	PC-1	FH-2.5
S32S-PDUNR/L11-40	4032B-11	○	○	40	32	31	250	45	22	8.5	12°							
A20Q-PDUNR/L11-27	PDUNR/L 2720B-11H	●	●	27	20	19	180	35	16	7.6	17°							
A25R-PDUNR/L11-32	3225B-11H	●	●	32	25	24	200	40	17	7.6	15°	0.8	LL-1D	LS-1S	LD-32	LSP-1	PC-1	FH-2.5
A32S-PDUNR/L11-40	4032B-11H	●	●	40	32	31	250	45	22	8.5	12°							

● Applicable Insert

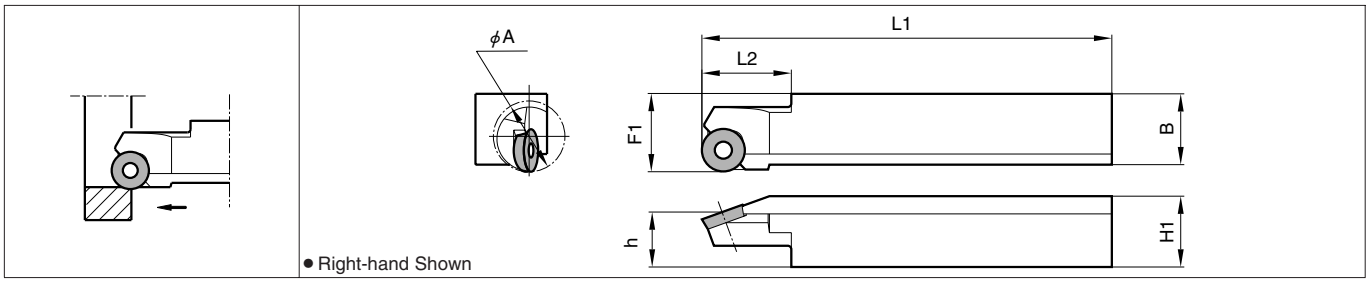
Application	Finishing	Finishing-Medium	Medium-Roughing	Finishing	Medium
Ref. Page	46	47	47	49	49
Shape / Toolholder	GP	HQ	GS	R/L-S	R/L
····PDUNR/L11-····	DNMG1104..	DNMG1104..	DNMG1104..	DNGG1104..	DNGG1104..

● Applicable Coolant Sleeve/Joint

Toolholder	Applicable Coolant Sleeve	Applicable Coolant Joint
A20Q-PDUNR/L11-27	SHC2040-70,SHC2050-95	SJS-8
A25R-PDUNR/L11-32	SHC2540-70,SHC2550-95	
A32S-PDUNR/L11-40	—	

● See Page 166 for Details of the Coolant Sleeve / Joint

■ SRCP-B (Thru Boring)

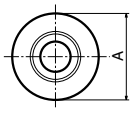


● Right-hand Shown

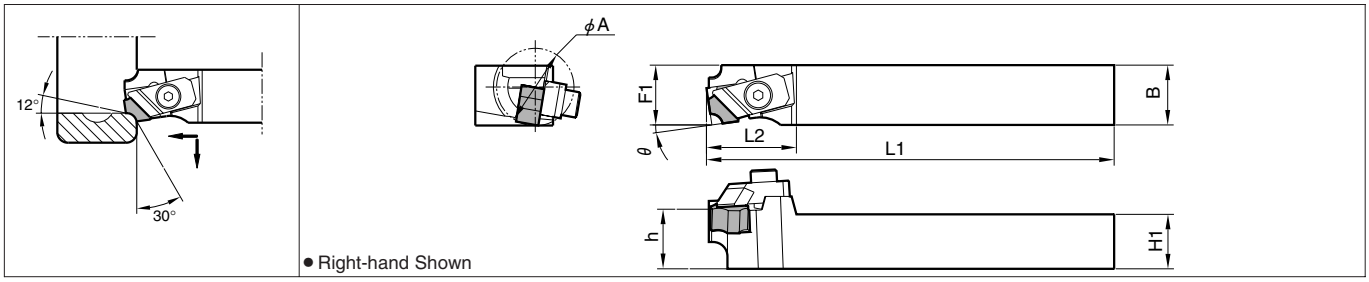
● Toolholder Dimension

Description		Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) H1	h	B	L1	L2	F1	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Wrench	Applicable Insert
SRCP R/L	2020B-12-A20	●	●	20	20	15.5	20	125	25	22	SB-4TR	FT-15	-	RPMT1203M0-BB
	2525B-16-A32	●	●	32	25	20	25	150	31	27	SB-5090TR	-	LTW-20	RPMT1604M0-BB

● Applicable Insert

Shape			Description	Dimension (mm) A	T	φd	R	Angle (°) α	Insert Grade Cermet TN6020	TN30	TN60	TN90	TC30	TC40
			RPMT 1203M0-BB	12.0	3.18	4.4	-	11°				●		
			RPMT 1604M0-BB	16.0	4.76	5.5	-					●		

■ CBSN-B (Internal Round-Chamfering)



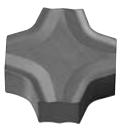
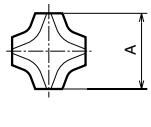
● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) H1	h	B	L1	L2	F1	θ	Spare Parts: Clamp Set	Spare Parts: Wrench	Applicable Insert
CBSN R/L	2020B-12-A20	●	●	20	20	21	20	125	30	20	9°	CP-RC R/L	LW-5	SNMF1204○○-21
	2525B-12-A20	●	●	20	25	26	25	150	30	25				

● Clamp Set: CP-RCR for R-hand Toolholder, CP-RCL for L-hand Toolholder

● Applicable Insert

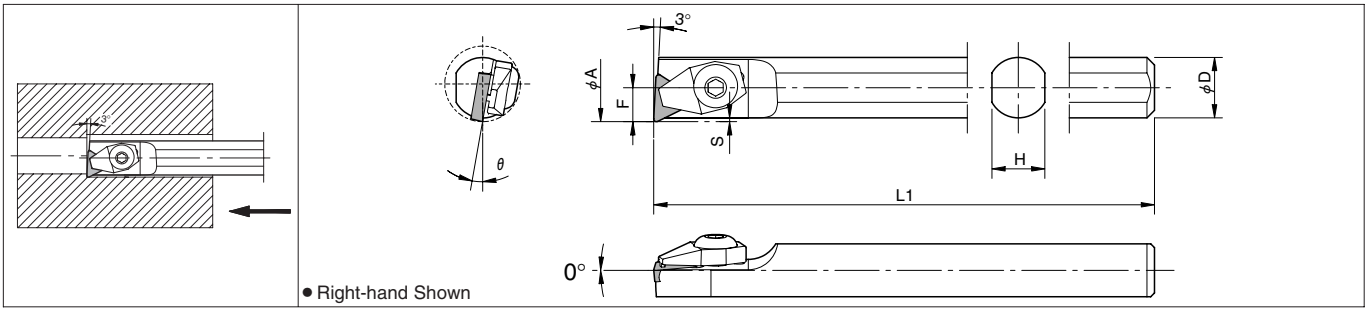
Shape				Description	Dimension (mm) A	T	B	R	Angle (°) θ	Insert Grade Cermet TN6020	TN30	TN60	TN90	TC30	TC40
				SNMF 120406-21	12.70	4.76	1.5	0.6	21°				●		
				SNMF 120410-21			3.0	1.0					●		
				SNMF 120416-21			3.1	1.6					●		
				SNMF 120421-21			3.2	2.1					●		
				SNMF 120426-21			3.3	2.6					●		

● : Std. Stock ○ : Check Availability

Boring Bars for Ceramic Tools [TB□□, TC□□ Insert] Top Clamp

■ S···CTXB-HM Special Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~6



● Right-hand Shown

● Toolholder Dimension

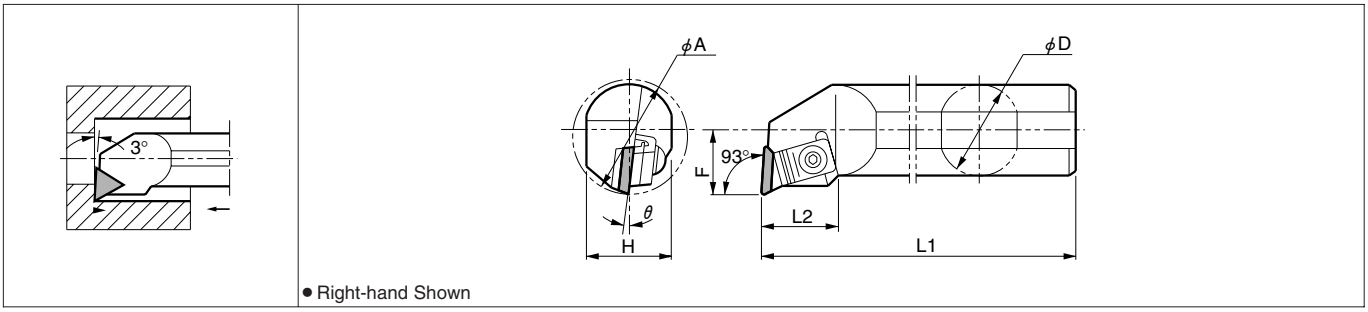
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	F	S	θ	Std. Corner-R	Spare Parts Clamp	Screw	Wrench
S08L-CTXBR/L06-10HM	–	●		10	8	7	140	4.5	0.5	8°	0.4	CP-1DE	BH3X6	SW-2
S12N-CTXBR/L06-15HM		●		15	12	11	160	6.6	0.6	10°				

● Applicable Insert

Application	Cast Iron / High Hard Mat'l	Cast Iron / High Hard Mat'l
Ref. Page	86	448
Shape / Toolholder	Ceramic	CBN (KBN10B/KBN25B)
----CTXBR/L16----	TBGN06001..	TBGN06001..

■ S···CTUC Steel Bar (Blind Hole Boring)

Max. Overhang Length L/D=~3



● Right-hand Shown

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
S32S-CTUCR/L16-40	CTUCR/L 4032B-16	○		40	32	30	250	27	22	6.5°	0.8	CB-13/12	CE-320	LW-4	SP-230P	SP3X10

● Chipbreaker: CB-13 for R-hand Toolholder, CB-12 for L-hand Toolholder

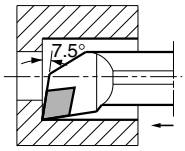
● Applicable Insert

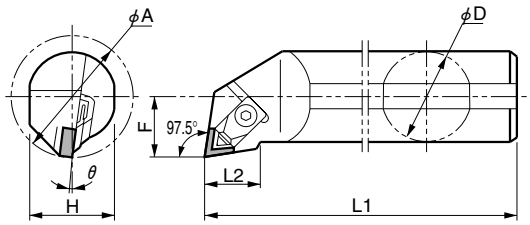
Application	Cast Iron
Ref. Page	86
Shape / Toolholder	Ceramic
----CTUCR/L16----	TCGN1604..

Boring Bars for Ceramic Tools [EN□□, SN□□ Insert] Top Clamp

■ S···CELN Steel Bar (Boring/Facing)

Max. Overhang Length L/D=~3



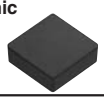


● Right-hand Shown

● Toolholder Dimension

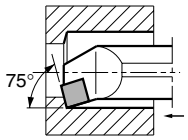
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
																
S40T-CELN$^{R}_{L}$13-50	**CELN$^{R}_{L}$ 5040B-13**	○		50	40	37	300	32	27	12°	0.8	**CB-16**	**CE-010**	**LW-4**	**SP-341P**	**M3X8**

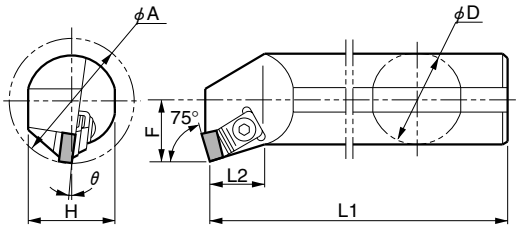
● Applicable Insert

Application	Cast Iron / High Hard Mat'l
Ref. Page	84
Shape / Toolholder	**Ceramic** 
----CELN$^{R}_{L}$13----	ENGN1307..

■ S···CSKN Steel Bar (Thru Boring)

Max. Overhang Length L/D=~3





● Right-hand Shown

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
																
S40T-CSKN$^{R}_{L}$12-50	**CSKN$^{R}_{L}$ 5040B-12**	●	●	50	40	37	300	26	27	10.5°	0.8	**CB-13/12**	**CE-320**	**LW-4**	**SP-141P (SP-143P)**	**M3X8 (M3X12)**

- Chipbreaker: CB-13 for R-hand Toolholder, CB-12 for L-hand Toolholder
- Shim & Shim Screw: Prepare Spare Parts in ( ) for SN□□1204○○ Insert

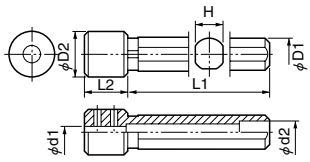
● Applicable Insert

Application	Cast Iron / High Hard Mat'l	Cast Iron	Cast Iron / High Hard Mat'l
Ref. Page	85	55	445
Shape / Toolholder	**Ceramic** 	**Coated/Cermet** 	**CBN(KBN900)** 
----CSKN$^{R}_{L}$12----	SNGN1207..(1204..) SNMN1207..	(SNGN1204..) (SNMN1204..)	(SNMN1204..)

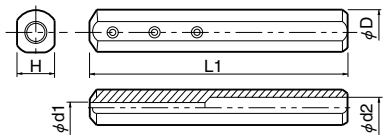
● : Std. Stock ○ : Check Availability

Sleeves for Boring Bars

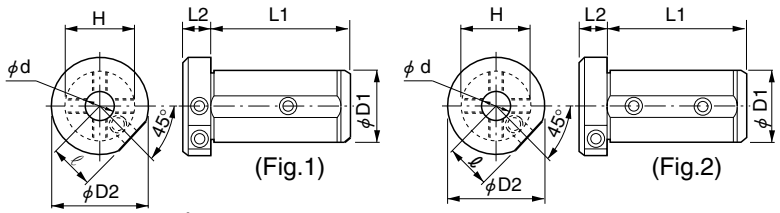
● Sleeves for Tip-Bar

Shape	Description	(Old Description)	Stock	Dimension (mm)							Spare Parts	
											Screw	Wrench
				ϕD1	ϕD2	ϕd1	ϕd2	H	L1	L2		
	PH 0212-60	PH -0212	●	12	19	1.8	6	11	60	20	HS3X4	LW-1.5
	0312-60	-0312	●			2.8						
	0412-60	-0412	●			3.8					HS4X4	LW-2
	0512-60	-0512	●			4.8						
	0612-60	-0612	●			5.8	8					
	0712-60	-0712	●			6.8						
	PH 0216-80	PH -0216	●	16	22	1.8	Rp¼ (PS¼)	14	80	20	HS3X4	LW-1.5
	0316-80	-0316	●			2.8						
	0416-80	-0416	●			3.8					HS4X4	LW-2
	0516-80	-0516	●			4.8						
	0616-80	-0616	●			5.8						
	0716-80	-0716	●			6.8						

● Sleeves for General Purpose Boring Bars

Shape	Description	(Old Description)	Stock	Dimension (mm)					Spare Parts	
									Screw	Wrench
				ϕD	ϕd1	ϕd2	H	L1		
	SH 0416-100	SH -0516	●	16	4	5	14	100	HS4X4	LW-2
	0516-100	-0616	●		5	6	14			
	0616-100	-0716	●		6	7	14			
	0716-100	-0816	●		7	8	14			
	SH 0820-120	SH -1020	●	20	8	9	18	120	HS4X4	LW-2
	1020-120	-1220	●	20	10	11	18	120		
	1225-150	-1625	●	25	12	13	23	150	HS5X5	LW-2.5
	1632-180	-2032	●	32	16	18	30	180		
	2032-180	-2532	○	32	20	22	30	180		

● Coolant Sleeves for Boring Bars with Coolant Hole



Accessory

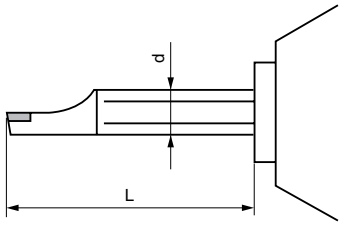
- Back Cover/SHL-4···SHC○○40-70 SHL-5···SHC○○50-95
- Back Cover Screw
- Shank Clamp Screw (Front / Back Screw)

Description	(Old Description)	Stock	Dimension (mm)							Shape	Spare Parts						
											Front Screw	Wrench	Back Screw	Wrench	Back Cover	Back Cover Screw	Wrench
			ϕD1	ϕD2	ϕd	L1	L2	H	ℓ								
SHC 0840-70	SHC -084070	●	40	56	8	70	16	38	27	Fig.1	HS6X22	LW-3	HS6X14	LW-3	SHL-4	HH3X6	LW-2.5
1040-70	-104070	●	40	56	10	70	16	38	27								
1240-70	-124070	●	40	56	12	70	16	38	27		HS10X10	LW-5	HS10X10	LW-5	SHL-4	HH3X6	LW-2.5
1640-70	-164070	●	40	56	16	70	16	38	27								
2040-70	-204070	●	40	56	20	70	16	38	27		HS10X10	LW-5	HS6X6	LW-3	SHL-4	HH3X6	LW-2.5
2540-70	-254070	○	40	56	25	70	16	38	27								
SHC 0850-95	SHC -085095	○	50	65	8	95	16	47	30.5	Fig.2	HS6X22	LW-3	HS6X14	LW-3	SHL-5	HH3X12	LW-2.5
1050-95	-105095	○	50	65	10	95	16	47	30.5								
1250-95	-125095	○	50	65	12	95	16	47	30.5		HS10X10	LW-5	HS10X10	LW-5	SHL-5	HH3X12	LW-2.5
1650-95	-165095	○	50	65	16	95	16	47	30.5								
2050-95	-205095	○	50	65	20	95	16	47	30.5								
2550-95	-255095	○	50	65	25	95	16	47	30.5								

● : Std. Stock ○ : Check Availability

Guide-Line

■ Guide-Line for Overhang Length of Boring Bar



● Guide-Line for Overhang Length

(Work Material: Carbon Steel)

Shank Type	L/d	Example
Steel Bar	3	S···SCLP
Excellent Bar	5	S···SCLP-E
Strong Bar	6	K···SCLP
Carbide Shank Bar	7	C···SCLP

■ Anti-Vibration Bar (Carbide Shank)

○Short Shank Series

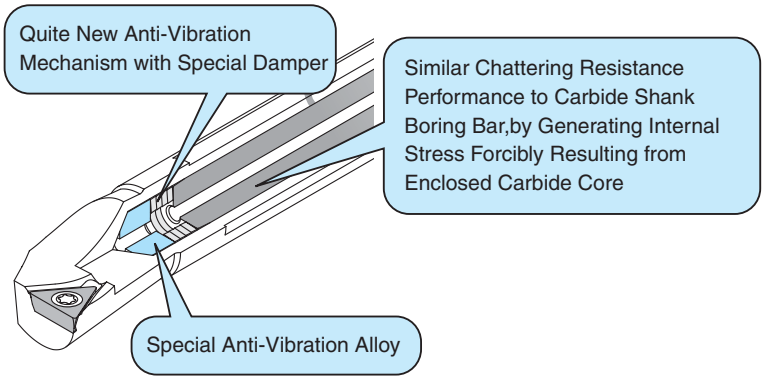
· Short Shank Types with length of 1/2 and 2/3 of standard type are available.
(-1/2 or -2/3 is shown at the end of the Description of SCLP, SWUP and STUP types)

· High Cost Performance

■ Strong Bar

Quite New, High Value-Added & Environmentally-Friendly Anti-Vibration Bar, with Less WC Component of Limited Resouce.

1. Similar Anti-Vibration Perfomance to Carbide Shank Boring Bar
2. More Economical than Carbide Shank Boring Bar
3. Silver Coat Toolholder from Wearing by Chips
4. Convienience with Overhang Scale



Recommended Cutting Conditions

min. Bore Dia : under 10mm

■ Recommended Cutting Conditions - Boring (Positive Insert)

ISO Classfication	Work Material (Hardness)		Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner -R	Lower Limit - Recommendation - Upper Limit		
								V_C (m/min)	ap (mm)	f (mm/rev)
P	**Low-carbon Steel Low-carbon Alloy** S10C,SCM415 SS400,SCr415 STKM,SP etc.		Finishing (Solid type)	Continous Interrupted	(VNB)	PR930	0.03 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,FSF	PR930	0.1 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	PR930	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Medium-carbon Steel Medium-carbon Alloy S45C SCM435 etc.		Finishing (Solid type)	Continous Interrupted	VNBR	PR930	0.03 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,FSF	PR930	0.1 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	PR930	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	High-carbon Alloy SKD11 SKD61 etc.		Finishing (Solid type)	Continous Interrupted	(VNB)	PR930	0.03 0.2	30 - 60 - 100 30 - 50 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,FSF	PR930	0.1 0.2	30 - 60 - 100 30 - 50 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	PR930	0.2 0.4	30 - 60 - 100 30 - 50 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
M	**Stainless Steel** SUS303,SUS304 SUS316,SUS420J2 etc.		Finishing (Solid type)	Continous Interrupted	(VNB)	PR930	0.03 0.2	30 - 60 - 100 30 - 50 - 70	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,FSF	PR930	0.1 0.2	30 - 60 - 100 30 - 50 - 70	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	PR930	0.2 0.4	30 - 60 - 100 30 - 50 - 70	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Stainless Steel SUS630 etc.		Finishing (Solid type)	Continous Interrupted	(VNB)	PR930	0.03 0.2	30 - 60 - 80 20 - 40 - 60	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,FSF	PR930	0.1 0.2	30 - 60 - 80 20 - 40 - 60	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	PR930	0.2 0.4	30 - 60 - 80 20 - 40 - 60	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
K	**Gray Cast Iron** FC200 FC250 FC300 etc.		Finishing (Solid type)	Continous Interrupted	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - 60 - 100 30 - 60 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F	KW10	0.1 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	CR7015	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Nodular Cast Iron FCD450 FCD600 etc.		Finishing (Solid type)	Continous Interrupted	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,U	KW10	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continous Interrupted	HQ	CR7015	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
N	**Non-ferrous Metal Copper Alloy Aluminum Alloy** (Si: under 10%) etc.		Finishing(High Speed) (Rainbow-colored Gloss)	Continous	Without Chipbreaker	KPD010	0.05	150 - 200 - 300	0.05 - 0.1 - 0.3	0.05 - 0.1 - 0.15
			Finishing	Continous Interrupted	F,U	KW10	0.1 0.2	100 - 150 - 200 100 - 150 - 200	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
S	**Titanium Alloy** Ti-6Al-4V etc.		Finishing Precision (Rainbow-colored Gloss)	Continous Interrupted	Without Chipbreaker	KPD010	0.1 0.2	100 - 120 - 150 70 - 100 - 120	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,U	KW10	0.1 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.2 - 0.5 0.05 - 0.2 - 0.5	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
	High-temperature Alloy Internal 625 Internal 718 etc.		Finishing (Solid type)	Continous Interrupted	(VNB)	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.03 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
			Finishing	Continous Interrupted	F,U	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.2 - 0.4 0.05 - 0.2 - 0.4	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
H	**Heat Treated Steel High Hard Mat'l** SKD11 SKD61 etc.	40~50 HRC	Finishing	Continous Interrupted	(VNB)	PR930	0.2 0.2	60 - 80 - 100 30 - 60 - 80	0.03 - 0.1 - 0.4 0.05 - 0.1 - 0.2	0.01 - 0.02 - 0.05 0.01 - 0.02 - 0.03
		45~68 HRC	Finishing	Continous Interrupted	SE SE-T	KBN25B	0.2 0.4	60 - 100 - 120 60 - 80 - 100	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.02 - 0.05 - 0.1 0.02 - 0.05 - 0.1

Recommended Cutting Conditions

min. Bore Dia : over 10mm

Recommended Cutting Conditions - Boring (Positive Insert)

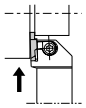
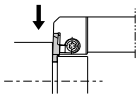
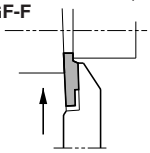
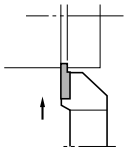
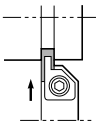
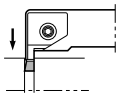
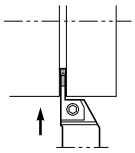
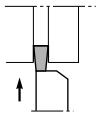
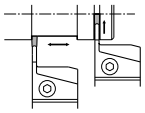
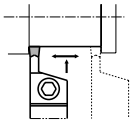
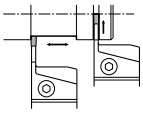
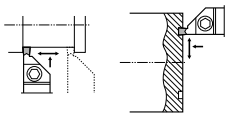
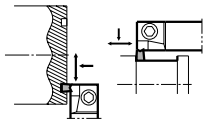
ISO Classfication	Work Material (Hardness)		Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner -R	Lower Limit - Recommendation - Upper Limit		
								V_C (m/min)	a_p (mm)	f (mm/rev)
P	Low-carbon Steel Low-carbon Alloy S10C,SCM415 SS400,SCr415 STKM,SP etc.		Finishing Precision	Continous Interrupted	FSF,USF	TN6020 PR930	0.1 0.2	250 - 300 - 350 100 - 150 - 200	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continous Interrupted	XP	PV7020 PV90	0.4 0.4	200 - 250 - 300 150 - 200 - 250	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continous Interrupted	XQ	PV7020 CA5025	0.4 0.4	150 - 200 - 250 100 - 150 - 200	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continous Interrupted	Conventional Molded	PV7020 CA5025	0.8 0.8	100 - 150 - 200 80 - 120 - 150	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
	Medium-carbon Steel Medium-carbon Alloy S45C SCM435 etc.		Finishing Precision	Continous Interrupted	FSF,USF	TN6020 PR930	0.2 0.4	150 - 200 - 250 150 - 120 - 150	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continous Interrupted	GP	PV7020 PV90	0.4 0.4	150 - 200 - 250 120 - 180 - 220	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continous Interrupted	HQ	PV7020 CA5025	0.4 0.4	120 - 180 - 220 100 - 150 - 200	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continous Interrupted	Conventional Molded	PV7020 CA5025	0.8 0.8	100 - 150 - 200 80 - 120 - 150	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
	High-carbon Alloy SKD11 SKD61 etc.		Precision Finishing	Continous Interrupted	FSF,USF	TN6020 PR930	0.2 0.4	120 - 150 - 180 100 - 120 - 150	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continous Interrupted	GP	PV7020 PV90	0.4 0.4	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continous Interrupted	HQ	PV7020 CA5025	0.4 0.4	120 - 150 - 180 100 - 120 - 150	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continous Interrupted	Conventional Molded	CR7015 CA5025	0.8 0.8	100 - 120 - 150 80 - 100 - 120	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
M	Stainless Steel SUS303,SUS304 SUS316,SUS420J2 etc.		Finishing	Continous Interrupted	HQ	CA6015	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 0.8 0.2 - 0.5 - 0.8	0.05 - 0.08 - 0.1 0.05 - 0.08 - 0.1
			Medium	Continous Interrupted	Conventional Molded	CA6015	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
	Stainless Steel SUS630 etc.		Finishing	Continous Interrupted	HQ	CA6015	0.4 0.8	80 - 100 - 120 60 - 80 - 100	0.2 - 0.7 - 1.0 0.2 - 0.7 - 1.0	0.05 - 0.1 - 0.15 0.05 - 0.1 - 0.15
			Medium	Continous Interrupted	Conventional Molded	CA6015	0.4 0.8	80 - 100 - 120 60 - 80 - 100	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
K	Gray Cast Iron FC200 FC250 FC300 etc.		Finishing (High Speed)	Continous Interrupted	Without Chipbreaker	KBN65B A66N	0.4 0.8	400 - 500 - 600 200 - 250 - 350	0.05 - 0.2 - 0.5 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.15 0.05 - 0.1 - 0.15
			Finishing (Gloss Oriented)	Continous Interrupted	Conventional Molded	TN30 TN6020	0.8 0.8	150 - 200 - 250 100 - 150 - 200	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing	Continous Interrupted	Conventional Molded	CR7015	0.4 0.8	150 - 180 - 200 100 - 150 - 180	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Medium	Continous Interrupted	Conventional Molded Without Chipbreaker	CR7015	0.8 0.8	100 - 150 - 200 80 - 120 - 150	0.5 - 1.0 - 2.0 0.5 - 1.0 - 2.0	0.1 - 0.15 - 0.2 0.05 - 0.1 - 0.15
	Nodular Cast Iron FCD450 FCD600 etc.		Finishing (High Speed)	Continous Interrupted	Without Chipbreaker	KBN10B A66N	0.4 0.8	200 - 300 - 400 150 - 200 - 250	0.05 - 0.2 - 0.5 0.2 - 0.5 - 1.0	0.03 - 0.05 - 0.1 0.05 - 0.1 - 0.15
			Finishing (Gloss Oriented)	Continous Interrupted	Conventional Molded	TN30 TN6020	0.8 0.8	150 - 180 - 200 100 - 120 - 150	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing	Continous Interrupted	Conventional Molded	CR7015	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Medium	Continous Interrupted	Conventional Molded Without Chipbreaker	CR7015	0.8 0.8	100 - 120 - 150 80 - 100 - 120	0.5 - 1.0 - 2.0 0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.15
N	Non-ferrous Metal Copper Alloy Aluminum Alloy (Si: under 10%) etc.		Finishing(High Speed) (Rainbow-colored Gloss)	Continous	Without Chipbreaker	KPD010	0.2	200 - 400 - 1000	0.05 - 0.1 - 0.3	0.05 - 0.1 - 0.15
			Finishing	Continous Interrupted	FSF,USF	KW10	0.4 0.4	100 - 200 - 400 100 - 200 - 400	0.05 - 0.5 - 1.0 0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
S	Titanium Alloy Ti-6Al-4V etc.		Finishing Precision (Rainbow-colored Gloss)	Continous Interrupted	Without Chipbreaker	KPD010	0.2 0.4	100 - 120 - 150 70 - 100 - 120	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1 0.03 - 0.07 - 0.1
			Finishing	Continous Interrupted	F,U	KW10	0.2 0.4	10 - 30 - 50 10 - 30 - 50	0.05 - 0.5 - 1.0 0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
	High-temperature Alloy Internal 625 Internal 718 etc.		Finishing	Continous Interrupted	F,U	KW10	0.4 0.4	10 - 30 - 50 10 - 30 - 50	0.05 - 0.5 - 1.0 0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
			Finishing	Continous Interrupted	HQ	CA6015	0.4 0.8	40 - 60 - 80 40 - 60 - 80	0.1 - 0.3 - 0.5 0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
H	Heat Treated Steel High Hard Mat'l SKD11 SKD61 etc.	40~50 HRC	Finishing	Continous Interrupted	HQ Without Chipbreaker	CR7015	0.8 0.8	60 - 80 - 100 30 - 50 - 70	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1 0.05 - 0.08 - 0.1
		45~68 HRC	Finishing	Continous Interrupted	Without Chipbreaker SE-T,ME-T	KBN10B KBN25B	0.4 0.8	80 - 120 - 150 60 - 100 - 120	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.02 - 0.07 - 0.1 0.02 - 0.07 - 0.1
			Medium	Continous	Without Chipbreaker (Negative)	KBN900	0.8	60 - 80 - 100	0.3 - 0.7 - 1.0	0.03 - 0.1 - 0.15

Grooving

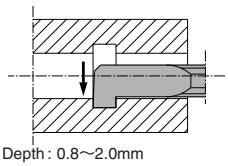
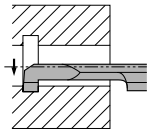
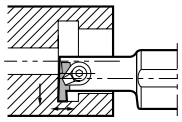
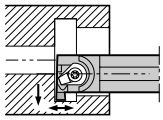
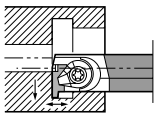
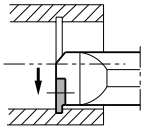
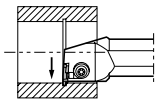
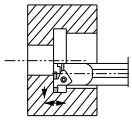
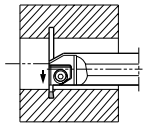
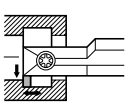
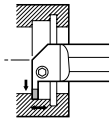
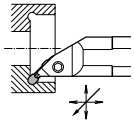
203～266

Product Lineup

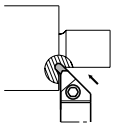
External Grooving

Shallow Grooving (3-Corner Use)	**KGBA** (P.208) **KGB** (P.209)  Depth : 1.0～5.0mm Width : 0.5～4.8mm	**KGBAS** (P.208) **KGBS** (P.209)  Depth :1.0～5.0mm Width : 0.5～4.8mm	**KTGF** (P.212) **KTGF-F**  Depth : 0.8～2.5mm Width : 0.33～2.5mm	**KTG** (P.212)  Depth : 2.0～5.0mm Width : 0.75～4.5mm	
Deep Grooving (1-Corner Use) (2-Corner Use)	**KGH** (P.214)  Depth : 13, 17mm Width : 4.0～12.0mm	**KGHS** (P.214)  Depth :13mm Width : 4.0～8.0mm	**KGA** (P.216)  Depth :16, 20, 25mm Width : 3.0, 4.0, 5.0mm	**KN91** (P.217)  Depth : 15, 17mm Width : 4.0～8.0mm	
CERACUT Plunge & Turn (Multi-Function)	**KGM** (P.221)  Depth : 5.0～16.0mm Width : 1.5～4.8mm	**KGM** (P.222)  Depth : 8.0～25.0mm Width : 3.0～8.0mm	**KGM-T** (P.223)  Depth :17.0～30.0mm Width : 2.0～6.0mm	**KGMM** (P.225)  Depth :4.8mm Width : 3.0, 4.0, 5.0mm	**KGMS** (P.226)  Depth : 4.8mm Width : 3.0, 4.0, 5.0mm

Internal Grooving

Internal Grooving (Small Dia.) (Solid) Min. Cutting Dia. ϕ4～ϕ8	**VNG** (P.230)  Depth : 0.8～2.0mm Width : 1.0, 2.0mm	**PSG-S** (P.231)  Depth : 1.5, 2.0mm Width : 1.0, 2.0mm			
Internal Grooving (Small Dia.) (1-Corner Use) (2-Corner Use) Min. Cutting Dia. ϕ12～ϕ40	**GIV** (P.232)  Depth : 2.2～6.3mm Width : 1.0～5.0mm	**GIV-E** (P.232)  Depth : 1.7～6.3mm Width : 1.0～5.0mm	**GIV-W** (P.232)  Depth : 2.2～6.3mm Width : 1.0～5.0mm		
Internal Shallow Grooving (Large Dia.) (3-Corner Use) Min. Cutting Dia. ϕ35,ϕ40,ϕ45	**KITG** (P.235)  Depth : 2.0, 2.5mm Width : 0.75～4.5mm	**KIGBA** (P.236)  Depth : 1.0～2.8mm Width : 0.5～4.8mm			
Internal Deep Grooving (Large Dia.) (2-Corner Use) Min. Cutting Dia. ϕ32～ϕ66	**KGIA** (P.238)  Depth : 10, 15mm Width : 3.0, 4.0, 5.0mm	**KIGH** (P.239)  Depth : 12.0mm Width : 4.0～8.0mm			
CERACUT Plunge & Turn (Multi-Function) Min. Cutting Dia. ϕ20.5～ϕ40, ϕ65	**KIGM** (P.240)  Depth : 5.5～11.0mm Width : 3.0, 4.0, 5.0mm	**KIGM-8** (P.240)  Depth : 20.0mm Width : 8.0mm	**KIGMU-8** (P.241)  Depth : 2.2mm Width : 8.0mm		

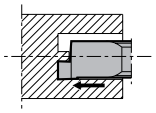
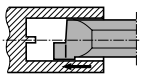
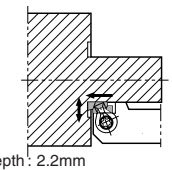
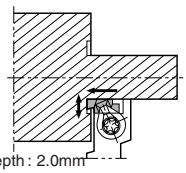
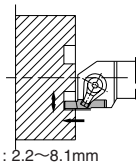
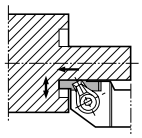
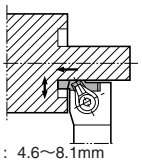
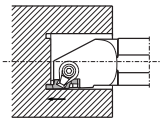
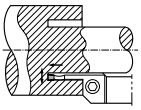
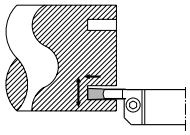
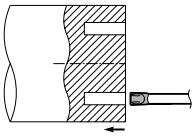
KGMU (P.227)



Depth : 0.8～2.5mm
Width : 3.0, 4.0, 5.0mm

■ Face Grooving

Face Grooving Diameter Table ➔ P.244

Face Grooving (Small Dia.) (Solid) Face Grooving Dia. ϕ8～	**VNFG** (P.245)  Depth : 2.0, 3.0mm Width : 1.0, 2.0, 3.0mm	**PSFG-S** (P.246)  Depth : 2.0mm Width : 1.0, 2.0, 3.0mm			
Face Grooving (Small Dia.) (2-Corner Use) Face Grooving Dia. ϕ8～	**GFVS-AA** (P.247)  Depth : 2.2mm Width : 1.0, 2.0, 3.0mm	**GFVT-AA** (P.248)  Depth : 2.0mm Width : 1.0, 2.0, 3.0mm			
Face Grooving (General Purpose) (2-Corner Use) Face Grooving Dia. See Each Page	**GFV** (P.249)  Depth : 2.2～8.1mm Width : 2.0～6.0mm	**GFVS** (P.251)  Depth : 4.6～8.1mm Width : 2.5～6.0mm	**GFVT** (P.252)  Depth : 4.6～8.1mm Width : 2.5～6.0mm	**GIFV** (P.255)  Depth : 2.2～8.1mm Width : 2.0～6.0mm	
CERACUT Plunge & Turn (Grooving) Face Grooving Dia. See Each Page	**KFMS** (P.256)  Depth : 13.0～32.0mm Width : 2.0～6.0mm	**KFMS-8** (P.258)  Depth : 25.0mm Width : 8.0mm		**KFTB-S** (P.259)  Depth : 25.0～38.0mm Width : 4.0, 5.0mm	

Guide for Grooving

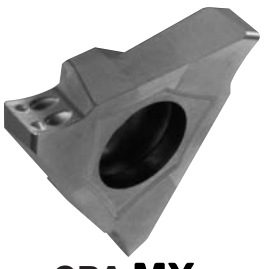
■ Guide for Grooving by Cermet Insert (General Steel)

1. Set up the f under 0.12 mm/rev. (0.05～0.10 mm/rev. normally)
2. Wet cutting is recommended.
3. Set up the V_C at 150～220 m/min.
4. Set up the Toolholder's Overhang as short as possible.

■ How to Make the Shiny Surface
(When the Surface Roughness under 3 μm Rz is required)

1. Increase the Cutting Speed (V_C = 220m/min Max)
2. Use Dwell-Motion at the groove bottom.
3. Apply light honing to the Cutting Edge by hand lapper.

■ Chip Control of Grooving Insert with Molded Chipbreaker

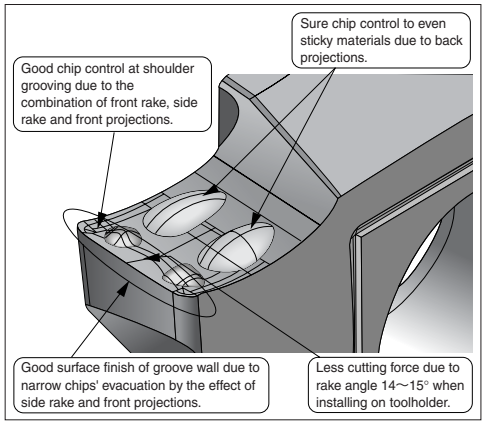


GBA-MY

3-Corner use Molded Chipbreaker

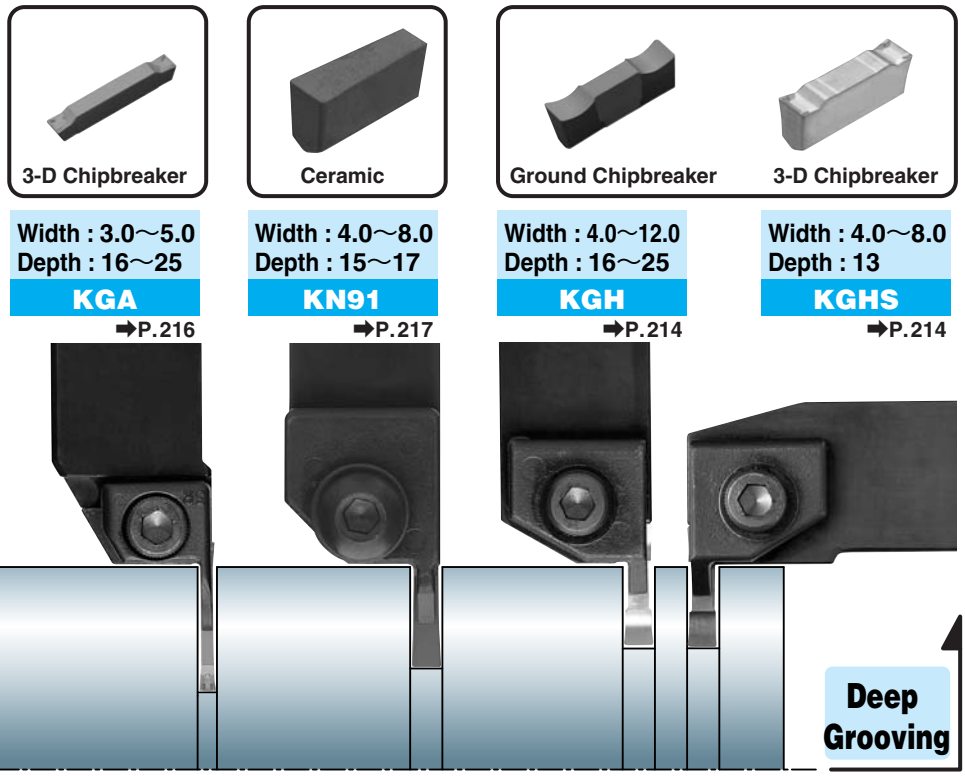
Advantages of MY Chipbreaker

1. Molded chipbreaker curls chips well and evacuate chips easily.
2. High Precision Molded Insert & High Economy with 3-Corner use.
3. Recommended to Automated Production or Unmanned Production.



Summary of External Grooving

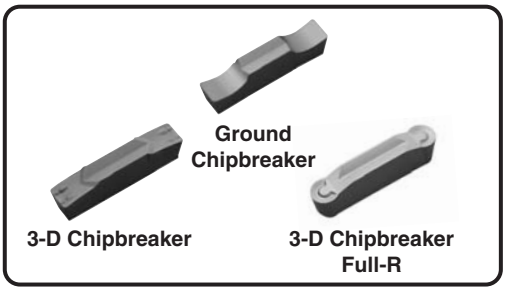
External Grooving



Edge Shape	General (Square)	Full-R (Round)	MY Chipbreaker
			

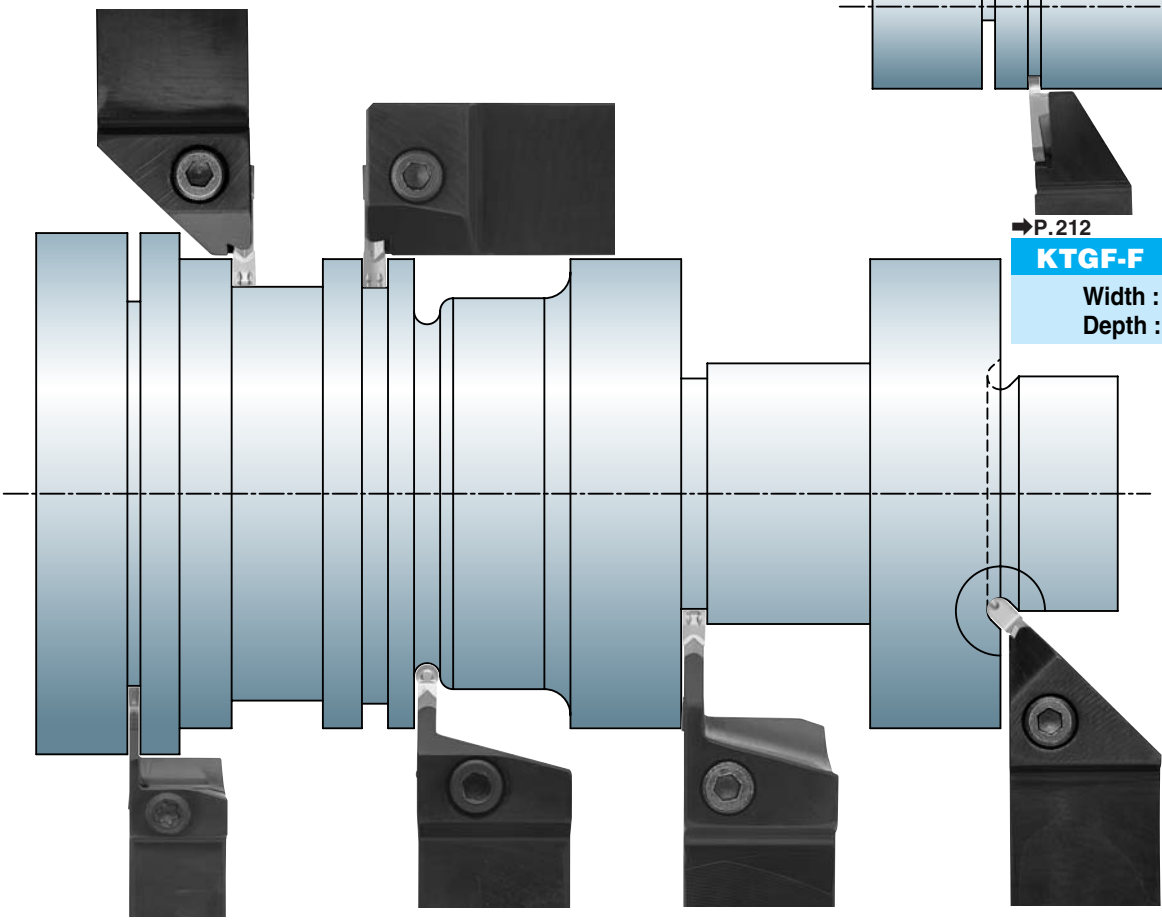
External Grooving & Traversing

Multi-Function CERACUT Plunge & Turn



Width : 3.0～5.0
Depth : 4.8
KGMM
➡P.225

Width : 3.0～5.0
Depth : 4.8
KGMS
➡P.226

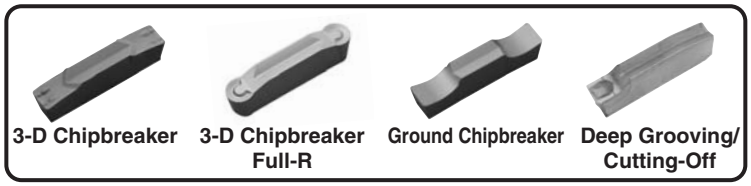


➡P.221
KGM
Width : 1.5～4.0
Depth : 5～16

➡P.222
KGM
Width : 3.0～8.0
Depth : 4～12.5

➡P.223
KGM-T
Width : 2.0～6.0
Depth : 17～30

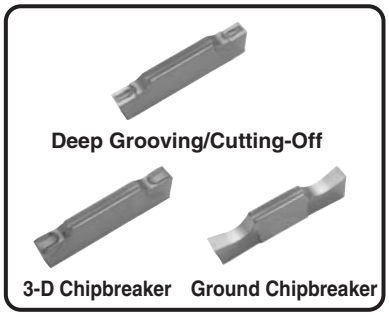
➡P.227
KGMU
Width : 3.0～5.0
Depth : 4.8

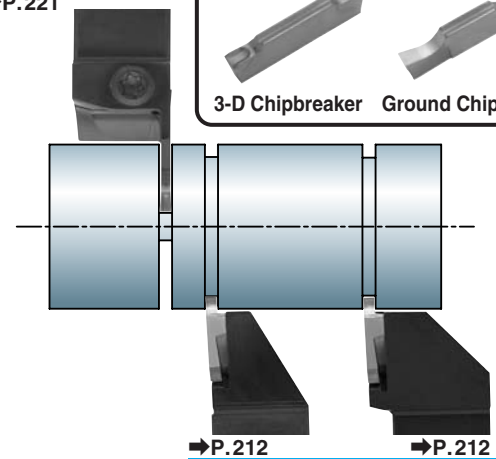


External Grooving of Precision Parts

Small Shank

Width : 1.5～4.0
Depth : 5～16
KGM
➡P.221

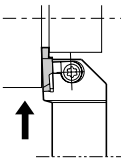


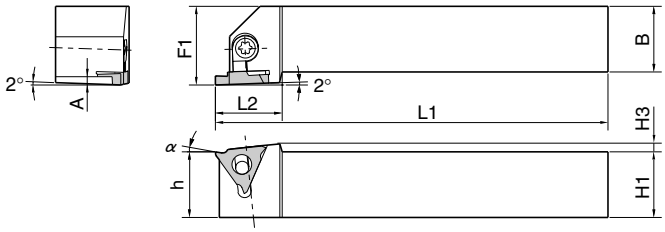


➡P.212
KTGF-F
➡P.212
KTGF
Width : 0.33～2.5
Depth : 0.8～2.5

External Shallow Grooving Toolholders [GBA Insert] Lever Lock

■ KGBA

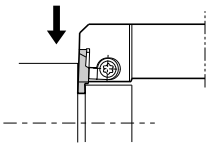


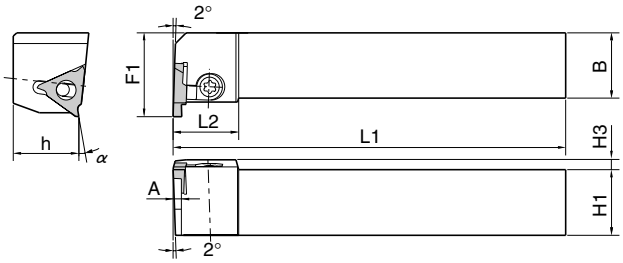


● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ KGBAS





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	A	Spare Parts: Clamp Set	Spare Parts: Wrench
KGBA R/L	2020K-16	●	●	20	4.0	20	125	24	25	-	LGBA-16 R/L S	FT-15
	2525M-16	●	●	25	4.0	25	150	24	30			
	2020K22-15	●	●	20	4.0	20	125	25.5	25	1.0	LGBA-22 R/L S	
	2525M22-15	●	●	25	4.0	25	150	25.5	30			
	2020K22-25	●	●	20	4.0	20	125	25.5	25	2.0		
	2525M22-25	●	●	25	4.0	25	150	25.5	30			
	2020K22-35	●	●	20	4.0	20	125	25.5	25	3.0		
	2525M22-35	●	●	25	4.0	25	150	25.5	30			
KGBAS R/L	2020K-16	●	●	20	4.0	20	125	25	25	-	LGBA-16 R/L S	FT-15
	2525M-16	●	●	25	4.5	25	150	25	30			
	2020K22-15	●	●	20	4.5	20	125	25	27	1.0	LGBA-22 R/L S	
	2525M22-15	●	●	25	5.0	25	150	25	32			
	2020K22-25	●	●	20	4.5	20	125	25	27	2.0		
	2525M22-25	●	●	25	5.0	25	150	25	32			
	2020K22-35	●	●	20	4.5	20	125	25	27	3.0		
	2525M22-35	●	●	25	5.0	25	150	25	32			

● Clamp Set : KGBA R/L ···LGBA-○RS for Right-hand Toolholder, LGBA-○LS for Left-hand Toolholder
KGBAS R/L ···LGBA-○LS for Right-hand Toolholder, LGBA-○RS for Left-hand Toolholder

● Applicable Insert

Toolholder	Insert		
KGBA R/L ···16	GBA32 R/L ○○○	-	GBA32 R/L 100R~150R
KGBA R/L ···22-15	GBA43 R/L 125~230	GBA43 R/L 200MY	GBA43 R/L 050R~100R
KGBA R/L ···22-25	GBA43 R/L 250~330	GBA43 R/L 250MY~300MY	GBA43 R/L 125R~150R
KGBA R/L ···22-35	GBA43 R/L 350~480	GBA43 R/L 350MY~400MY	GBA43 R/L 200R
KGBAS R/L ···16	GBA32 L/R ○○○	-	GBA32 R/L 100R~150R
KGBAS R/L ···22-15	GBA43 L/R 125~230	GBA43 L/R 200MY	GBA43 L/R 050R~100R
KGBAS R/L ···22-25	GBA43 L/R 250~330	GBA43 L/R 250MY~300MY	GBA43 L/R 125R~150R
KGBAS R/L ···22-35	GBA43 L/R 350~480	GBA43 L/R 350MY~400MY	GBA43 L/R 200R

● Rake Angle(α) after Installment of GBA type

GBA32 R/L ○○○ α	Insert Grade
10°	TN90 PR630 PR930 KPD010
20°	KW10

GBA43 R/L ○○○ α	Insert Grade
0°	KBN10B
10°	TN90 PR630 PR930 KPD010 KPD001
20°	KW10

GBA43 R/L ○○○R(Full-R) α	Insert Grade	
10°	TN90 PR630 PR930	050R~150R
14°	TN90 PR630 PR930 KW10	200R ···050R~200R

● Rake Angle (α) after Installment of GBA-MY type

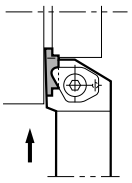
α	Insert
15°	GBA43 R/L 200MY
15°	GBA43 R/L 250MY
15°	GBA43 R/L 300MY
15°	GBA43 R/L 350MY
14°	GBA43 R/L 400MY

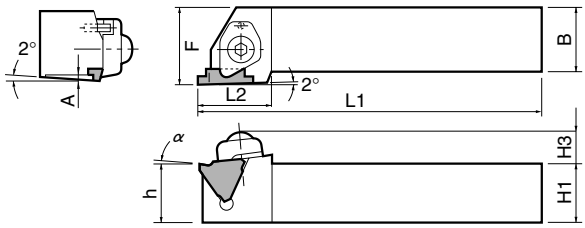
α means the Rake Angle at the Center of the Edge Width, after Installing Insert

● : Std. Stock ○ : Check Availability

External Shallow Grooving Toolholders [GBA/GB Insert] Top Clamp

■ KGB

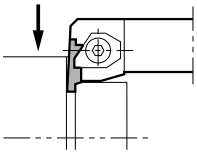


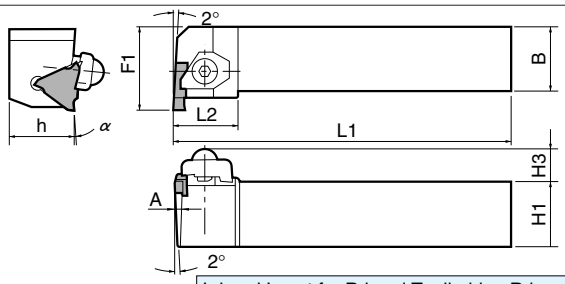


● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ KGBS





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	A	Spare Parts Clamp	Clamp Bolt	Spring	Wrench
KGB R/L	2020K-16	○	○	20	11	20	125	24	25	-	CGB R/L	BH6X25	SP-6	LW-4
	2525M-16	○	○	25	11	25	150	24	30					
	2020K22-15	●	●	20	11.5	20	125	25.5	25	1.0	CGB R/L	BH6X25	SP-6	LW-4
	2525M22-15	●	●	25	11.5	25	150	25.5	30					
	2020K22-25	●	●	20	11.5	20	125	25.5	25	2.0	CGB R/L	BH6X25	SP-6	LW-4
	2525M22-25	●	●	25	11.5	25	150	25.5	30					
	2020K22-35	●	●	20	11.5	20	125	25.5	25	3.0	CGB R/L	BH6X25	SP-6	LW-4
	2525M22-35	●	●	25	11.5	25	150	25.5	30					
KGBS R/L	2020K-16	●	○	20	11	20	125	25	25	-	CGB L/R	BH6X25	SP-6	LW-4
	2525M-16	○	○	25	11	25	150	25	30					
	2020K22-15	●	●	20	11.5	20	125	25	27	1.0	CGB L/R	BH6X25	SP-6	LW-4
	2525M22-15	●	●	25	11.5	25	150	25	32					
	2020K22-25	●	●	20	11.5	20	125	25	27	2.0	CGB L/R	BH6X25	SP-6	LW-4
	2525M22-25	●	●	25	11.5	25	150	25	32					
	2020K22-35	●	●	20	11.5	20	125	25	27	3.0	CGB L/R	BH6X25	SP-6	LW-4
	2525M22-35	●	●	25	11.5	25	150	25	32					

● Clamp : KGB R/L ··· CGBR for Right-hand Toolholder, CGBL for Left-hand Toolholder
KGBS R/L ···CGBL for Right-hand Toolholder, CGBR for Left-hand Toolholder

● Applicable Insert

Toolholder	Insert		
KGB R/L···16	GBA32 R/L○○○ GB32 R/L○○○	-	-
KGB R/L···22-15	GBA43 R/L 125~230 GB43 R/L 100~230	GBA43 R/L 200MY	GBA43 R/L 050R~100R GB43 R/L 050R~100R
KGB R/L···22-25	GBA43 R/L 250~330 GB43 R/L 243~330	GBA43 R/L 250MY~300MY	GBA43 R/L 125R~150R GB43 R/L 125R~150R
KGB R/L···22-35	GBA43 R/L 350~480 GB43 R/L 350~480	GBA43 R/L 350MY~400MY	GBA43 R/L 200R GB43 R/L 200R
KGBS R/L···16	GBA32 L/R○○○ GB32 L/R○○○	-	-
KGBS R/L···22-15	GBA43 L/R 125~230 GB43 L/R 100~230	GBA43 L/R 200MY	GBA43 L/R 050R~100R GB43 L/R 050R~100R
KGBS R/L···22-25	GBA43 L/R 250~330 GB43 L/R 243~330	GBA43 L/R 250MY~300MY	GBA43 L/R 125R~150R GB43 L/R 125R~150R
KGBS R/L···22-35	GBA43 L/R 350~480 GB43 L/R 350~480	GBA43 L/R 350MY~400MY	GBA43 L/R 200R GB43 L/R 200R

● Rake Angle(α) after Installment of GB type

GB32 R/L○○○ α	Insert Grade
5°	TC60 PR630
20°	KW10

GB43 R/L○○○ α	Insert Grade
5°	TN60 TC40 TC60 PR630 PR930
10°	KPD010
20°	KW10

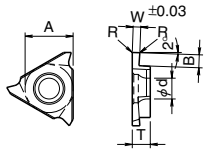
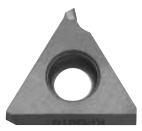
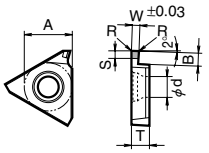
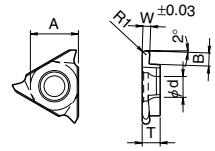
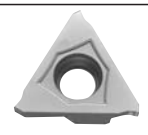
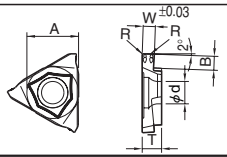
GB43 R/L○○○R(Full-R) α	Insert Grade
5°	TC60 PR630 } 050R~150R
14°	TC60 PR630 KW10···050R~200R } 200R

● The Rake Angle of GBA & GBA-MY Insert is the same as KGBA/KGBAS type. ➡ P.208

● : Std. Stock ○ : Check Availability

External Shallow Grooving Toolholders

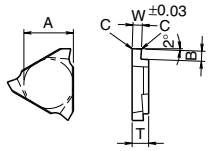
● Applicable Insert

Shape (Right-hand Shown)	Description		Dimension (mm) W	B	R	A	T	φd	Insert Grade: Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001
 	GBA32R/L	050 ※	0.50	1.0	R0.05	9.525	3.18	4.4		R			○	●	○			
		075	0.75	2.0						R			○	●	○			
		095	0.95							R			○	●	○			
		100	1.00							●			○	●	○			
		110	1.10		R0.2									●				
		120	1.20											●				
		125	1.25										○	●	○			
		130	1.30											●				
		140	1.40											●				
		145	1.45										○	●	○			
		150	1.50							●			○	●	○			
		160	1.60											●				
		170	1.70											●				
		175	1.75										○	●	○			
		200	2.00							●			○	●	○			
		225	2.25	2.5										●				
		250	2.50							R			○	●	○			
		300	3.00							●				●				
	GBA43R/L	125	1.25	2.0	R0.2	12.70	4.76	5.5		●			○	●	○			
		140	1.40											●				
		145	1.45							R			○	●	○			
		150	1.50							●			○	●	○			
		170	1.70	3.5						●				●				
		175	1.75							●			○	●	○			
		185	1.85							R			○	●	○			
		195	1.95											●				
		200	2.00							●			○	●	○			
		225	2.25											●				
		230	2.30							●			○	●	○			
		250	2.50	4.0	R0.3					●			○	●	○			
		265	2.65							R			○	●	○			
		280	2.80							●			○	●	○			
		300	3.00							●			○	●	○			
		325	3.25							●				●				
		330	3.30							R			○	●	○			
		350	3.50							●			○	●	○			
		400	4.00	5.0	R0.4					●			○	●	○			
		430	4.30							R			○	●	○			
		450	4.50							R			○	●	○			
		480	4.80				5.00			R			○	●	○			
 1-Corner Use	GBA32R/L	125	1.25	2.0	R0.1	9.525	3.18	4.4									L	
		150	1.50														R	
 GBA32 S=1.7 GBA43 S=1.9	GBA43R/L	125	1.25	2.0	R0.1	12.70	4.76	5.5									○	
		125	1.25		R0.2											R		
		150	1.50	3.5	R0.1												○	○
		150	1.50		R0.2											●		
		200	2.00		R0.1												○	○
		200	2.00		R0.2											R		
		250	2.50	4.0	R0.1												○	○
		250	2.50		R0.2											R		
		300	3.00		R0.1												R	○
		300	3.00		R0.2											R		
 Full-R	GBA32R/L	100R	2.00	2.5	R1.00	9.525	3.18	4.4						R				
		150R	3.00		R1.50									R				
	GBA43R/L	050R	1.00	2.0	R0.50	12.70	4.76	5.5		●			○	●	○			
		075R	1.50	3.5	R0.75					●			○	●	○			
		100R	2.00		R1.00					●			○	●	○			
		125R	2.50	4.0	R1.25					●			○	●	○			
		150R	3.00		R1.50					●			○	●	○			
		200R	4.00	5.0	R2.00					●			○	●	○			
 With MY Chipbreaker	GBA43R/L	200MY	2.00	3.5	R0.2	12.70	4.76	5.5						●				
		250MY	2.50	4.0	R0.3									●				
		300MY	3.00		R0.3									●				
		350MY NEW	3.50	5.0	R0.3									●				
		400MY	4.00		R0.4									●				

• The Edge Width Tolerance of GBA32R/L050 is different: $0.50^{+0.05}_{-0}$ (※)

● : Std. Stock ○ : Check Availability R : R-hand Only

● Applicable Insert

Shape (Right-hand Shown)	Description			Dimension (mm) W	B	R or C	A	T	ϕd	Insert Grade: Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001
	GB32R/L	050	※	0.50	1.0	C0.05	9.525	3.18	-				○	R		○			
		075		0.75	2.0	C0.10							○	R		○			
		095		0.95									○	R		○			
		100		1.00									○	○		○			
		125		1.25									○	R		○			
		145		1.45									○	R		○			
		150		1.50									○	R		○			
		200		2.00	2.5								○	R		○			
		250		2.50									○	R		○			
	GB43R/L	100		1.00	2.0	C0.2	12.70	4.76	-				R						
		120		1.20		C0.2				●									
		125		1.25		R0.1									○				
		125				R0.2						○	○	○		○			
		140		1.40		R0.2				●									
		145		1.45		R0.2						○	○	R		○			
		150		1.50	3.5	R0.1									○				
		150				R0.2				●		○	○	○		○			
		170		1.70		R0.2				●									
		175		1.75		R0.2						○	○	R		○			
		185		1.85		R0.2						○	○	R		○			
		195		1.95		R0.2				●									
		200		2.00		R0.1									○				
		200				R0.2				●		○	○	○		○			
		225		2.25		R0.2				●									
		230		2.30		R0.2						○	○	R		○			
		243		2.43	4.0	R0.3				R									
		250		2.50		R0.1									○				
		250				R0.3				●		○	○	○		○			
		265		2.65		R0.3						○	○	R		○			
		275		2.75		R0.3				●									
		280		2.80		R0.3						○	○	R		○			
		300		3.00		R0.1									○				
		300				R0.3				●		○	○	○		○			
		325		3.25		R0.3				●									
		330		3.30		R0.3						○	○	R		○			
		350		3.50	5.0	R0.1									○				
		350				R0.3				●		○	○	○		○			
		400		4.00		R0.1									○				
		400				R0.4				●		○	○	○		○			
		425		4.25		R0.4				●									
		430		4.30		R0.4						○	○	R		○			
		450		4.50		R0.4						○	○	○		○			
		480		4.80		R0.4		5.00				○	○	○		○			
1-Corner Use	GB43R/L	125		1.25	2.0	R0.1	12.70	4.76	-									○	
		150		1.50	3.5													○	
		200		2.00														○	
		250		2.50	4.0													○	
		300		3.00														○	
Full-R	GB43R/L	050R		1.00	2.0	R0.50	12.70	4.76	-				●	○		○			
		075R		1.50	3.5	R0.75							●	○		○			
		100R		2.00		R1.00							●	○		○			
		125R		2.50	4.0	R1.25							○	○		○			
		150R		3.00		R1.50							R	○		○			
		200R		4.00	5.0	R2.00							○	○		○			

GB type Insert changes to GBA type in order. When replacing with GBA Insert, be careful for the Corner-R specification.

- The Edge Width Tolerance of GB32R/L 050 is different: $0.50^{+0.05}_{0}$ (※)
- Dimension B shows available Grooving Depth
- Corner-R of GB43R/L PR930 is 0.1mm. When replacing with GBA Insert, be careful for the Corner-R specification.

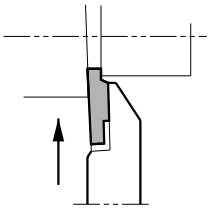
Recommended Cutting Conditions ➡ P.260

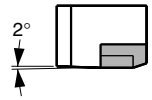
● : Std. Stock ○ : Check Availability R : R-hand Only

External Shallow Grooving Toolholders [TGF/TG Insert]

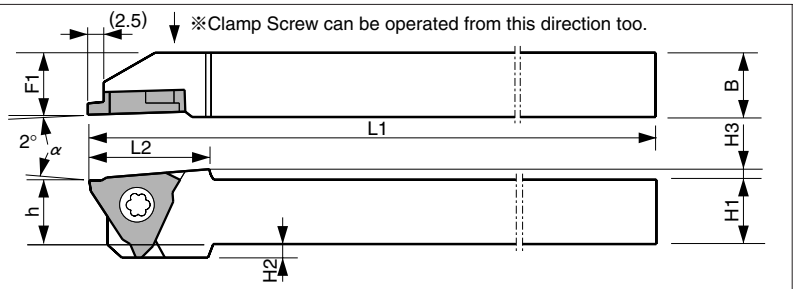
■ KTGF-F (Without Offset)

Small Shank





α	Insert Grade
20°	TN60, TN90, TC60 PR630, PR930, KW10
11°	KPD010, KPD001
6°	TC40

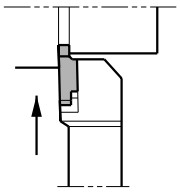


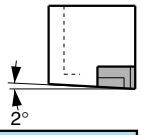
● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

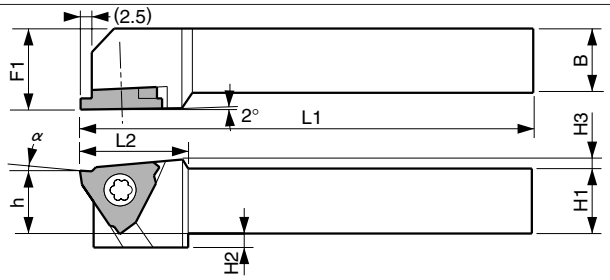
■ KTGF (With Offset)

Small Shank





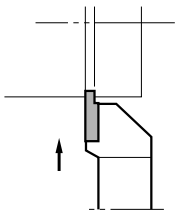
α	Insert Grade
20°	TN60, TN90, TC60 PR630, PR930, KW10
11°	KPD010, KPD001
6°	TC40

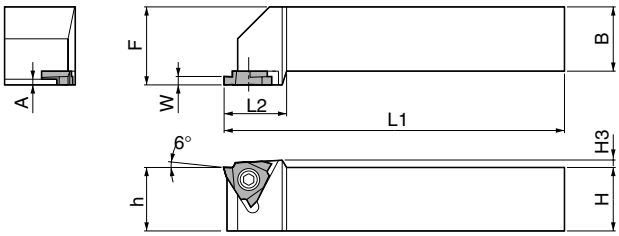


● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ KTG





● Right-hand Shown

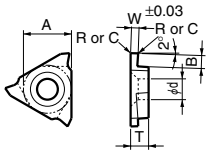
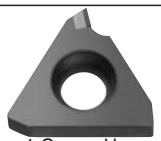
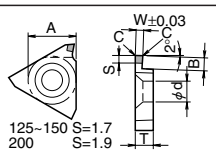
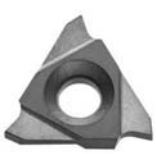
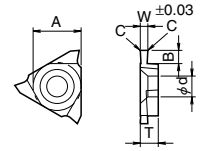
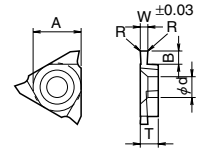
R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	Spare Parts: Clamp Screw	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Wrench	Applicable Insert
KTGF R/L	1010K-16F	●	●	10	2	2.5	10	125	18.5	10	-	SB-4070TRW	-	FT-8	-	TGF32 R/L ○○○
	1212M-16F	●	●	12	-	2.5	12	150	18.5	12						TGF32 R/L S○○○-S
	1616M-16F	●	●	16	-	2.5	16	150	18.5	16						TGF32 R/L S○○○-SRG
KTGF R/L	1010F-16	●	●	10	4	2.5	10	80	18.5	12	-	GS-40TR	-	FT-10	-	TGF32 R/L ○○○
	1212H-16	●	●	12	2	2.5	12	100	18.5	16						TGF32 R/L S○○○-S
	1616H-16	●	●	16	-	2.5	16	100	18.5	20						TGF32 R/L S○○○-SRG
	2020K-16	●	●	20	-	2.5	20	125	18.5	25						
	2525M-16	●	●	25	-	2.5	25	150	18.5	32						
KTG R/L	2020K-16	○	○	20	-	3.0	20	125	20	25	-	SB-4TR	-	FT-15	-	TG32 R/L ○○○
	2525M-16	○	○	25		3.0	25	150	20	30						
	2020K22-15	○	○	20	-	3.0	20	125	25	25	1.0	-	GS-50	-	LW-3	TG43 R/L 150~230
	2525M22-15	○	○	25		3.0	25	150	25	30						
	2020K22-25	○	○	20	-	3.0	20	125	25	25	2.0	-	GS-50	-	LW-3	TG43 R/L 250~330
	2525M22-25	○	○	25		3.0	25	150	25	30						
	2020K22-35	○	○	20	-	3.0	20	125	25	25	3.0	-	GS-50	-	LW-3	TG43 R/L 350~450
	2525M22-35	○	○	25		3.0	25	150	25	30						

● : Std. Stock ○ : Check Availability

● Applicable Insert

Shape (Right-hand Shown)	Description		Dimension (mm) W	B	R or C	A	T	φd	Insert Grade: Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001
		**TGF32R/L 033**	0.33	0.8	C0.05	9.525	3.18	4.5					○	R ●	●			
		050	0.50	1.2					●	R	○	R	○	●	●			
		060	0.60						●									
		075	0.75	2.0	C0.1					○	○	R	○	●	●			
		080	0.80						●									
		090	0.90						●									
		095	0.95							R	○	○	○	●	●			
		100	1.00						●	○	○	○	○	●	●			
		120	1.20						●					●				
		125	1.25							○	○	○	○	●	●			
		130	1.30						●									
		140	1.40						●					●				
		145	1.45							R	○	○	○	●	●			
		150	1.50						●	R	○	○	○	●	●			
		170	1.70						●									
		175	1.75							R	○	○	○	●	●			
		185	1.85	2.5										●				
		190	1.90						●									
		200	2.00						●	R	○	○	○	●	●			
		225	2.25						●									
		250	2.50						●	R	○	○	○	●	●			
		275	2.75	3.0	R0.2				●					●				
		300	3.00						●					●				
		325	3.25						●					●				
	TGF32R/L S○○○-S type Edge Width Tolerance W +0.2 +0.06	**TGF32R/L S 090-S**	0.90	2.0	C0.05	9.525	3.18	4.5	●									
		110-S	1.10						●									
		130-S	1.30						●									
		160-S	1.60						●									
		185-S	1.85	2.5					●									
	TGF32R/L S○○○-SRG type Edge Width Tolerance W +0 −0.05 For Circlip Grooves (DIN 471/472)	**TGF32R/L S 080-SRG**	0.87	2.0	R max 0.03	9.525	3.18	4.5	●									
		090-SRG	0.97						●									
		100-SRG	1.07						●									
		110-SRG	1.24						●									
		130-SRG	1.44						●									
		160-SRG	1.74						●									
		185-SRG	1.99	2.5					●									
		215-SRG	2.29						●									
		265-SRG	2.79	3.0					●									
		315-SRG	3.29						●									
 1-Corner Use	 125~150 S=1.7 200 S=1.9	**TGF32R/L 125**	1.25	2.0	C0.1	9.525	3.18	4.5									R	R
		150	1.50														R	R
		200	2.00	2.5													R	R
		**TG32R/L 075**	0.75	2.0	C0.1	9.525	3.18	4.5	○									
		095	0.95						○									
		125	1.25						○									
		145	1.45						○									
		150	1.50						○									
		175	1.75						○									
		200	2.00						○									
		**TG43R/L 150**	1.50	3.5	R0.2	12.70	4.76	5.5	○									
		175	1.75						○									
		200	2.00						○									
		230	2.30						○									
		250	2.50	4.0	R0.3				○									
		265	2.65						○									
		280	2.80						○									
		300	3.00						○									
		330	3.30	5.0	R0.4				○									
		350	3.50						○									
		400	4.00						○									
		430	4.30						○									
		450	4.50						○									

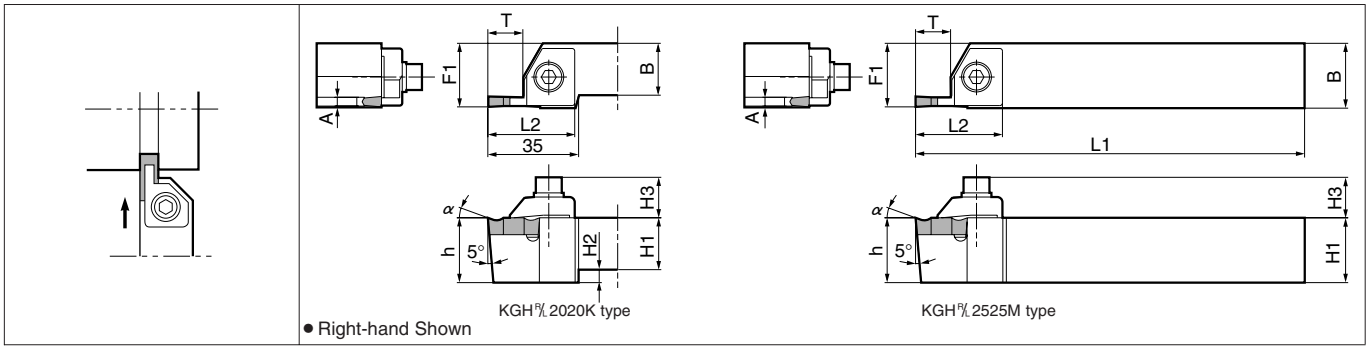
● Dimension B shows available Grooving Depth

Recommended Cutting Conditions P.261

● : Std. Stock ○ : Check Availability R : R-hand Only

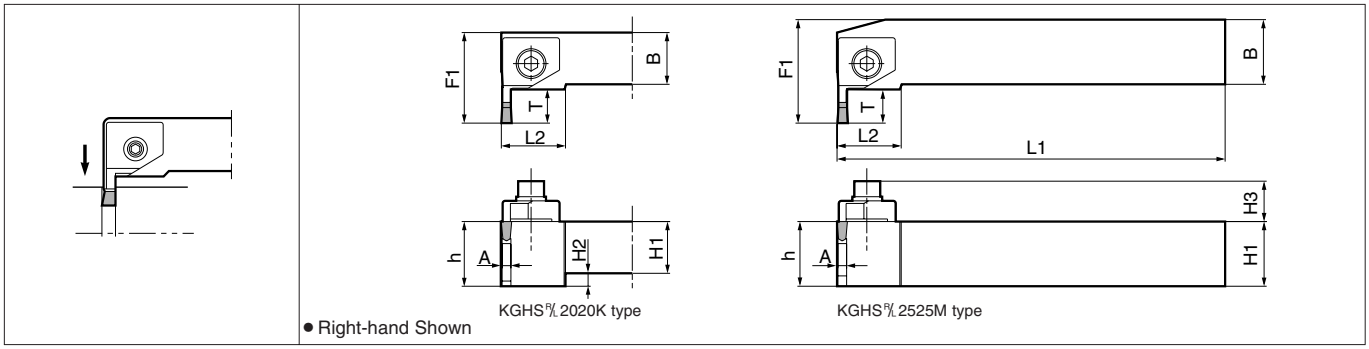
External Deep Grooving Toolholders [GH/GHU Insert]

■ KGH



● Right-hand Shown

■ KGHS



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	T	Spare Parts Clamp	Clamp Bolt	Washer	Spring	Wrench
KGH R/L	2020K-4	●	●	20	5	15.6	20	125	33.5	24.5-24.8	3.4	13	CGH-1 R/L	HH6X25	W-6	SP-6	LW-5
	2525M-4	●	●	25	-	15.6	25	150	33.5	24.5-24.8	3.4	13					
	2020K-5	●	●	20	5	15.6	20	125	33.5	25.0-25.8	4.2	13	CGH-1 R/L	HH6X25	W-6	SP-6	LW-5
	2525M-5	●	●	25	-	15.6	25	150	33.5	25.0-25.8	4.2	13					
	3225P-5	○	○	32	-	15.6	25	170	33.5	25.0-25.8	4.2	13					
	2020K-7	●	●	20	5	15.6	20	125	33.5	24.5-25.0	5.8	13	CGH-2 R/L	HH6X25	W-6	SP-6	LW-5
	2525M-7	●	●	25	-	15.6	25	150	33.5	24.5-25.0	5.8	13					
	2525M-10	○	○	25	-	16.1	25	150	41	25.5-26.5	9.0	17	CGH-3 R/L	HH6X25	W-6	SP-6	LW-5
	3225P-10	○		32	-	16.1	25	170	41	25.5-26.5	9.0	17					
KGHS R/L	2020K-4	○	●	20	5	15.6	20	125	25	35	3.4	13	CGH-1 L/R	HH6X25	W-6	SP-6	LW-5
	2525M-4	●	○	25	-	15.6	25	150	25	40	3.4	13					
	2020K-5	○	○	20	5	15.6	20	125	25	35	4.2	13	CGH-1 L/R	HH6X25	W-6	SP-6	LW-5
	2525M-5	○	○	25	-	15.6	25	150	25	40	4.2	13					
	2525M-7	○	○	25	-	15.6	25	150	25	40	5.8	13	CGH-2 L/R	HH6X25	W-6	SP-6	LW-5

● Dimension T shows available Grooving Depth

- F1 Dimension of KGH R/L type depends on the Insert's Edge Width.
- Clamp : KGH R/L ···CGH-○R for Right-hand Toolholder, CGH-○L for Left-hand Toolholder
  KGHS R/L ···CGH-○L for Right-hand Toolholder, CGH-○R for Left-hand Toolholder

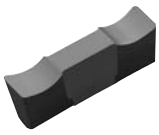
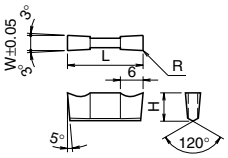
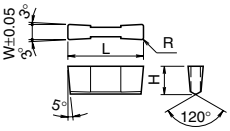
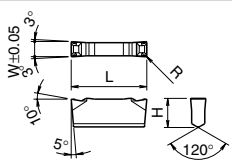
● Rake Angle(α) after Installment of GH / GHU type

GH○○○○-○○		GHU○○○○	
α	Insert Grade	α	Insert Grade
0°	A65, A66N	10°	TN60 CR9025
10°	TC40		
20°	TN90, TC60 PR630, PR930 KW10		

● : Std. Stock ○ : Check Availability

● Applicable Insert

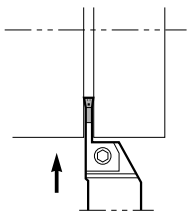
Toolholder	Insert	
KGH□…4	GH4020-○○ GH4520-○○	GHU4020
KGH□…5	GH5020-○○ GH5520-○○ GH6020-○○ GH6520-○○	GHU5020 GHU6020
KGH□…7	GH7020-○○ GH7520-○○ GH8020-○○	-
KGH□…10	GH10025-05 GH12025-05	-
KGHS□…4	GH4020-○○ GH4520-○○	GHU4020
KGHS□…5	GH5020-○○ GH5520-○○ GH6020-○○ GH6520-○○	GHU5020 GHU6020
KGHS□…7	GH7020-○○ GH7520-○○ GH8020-○○	-

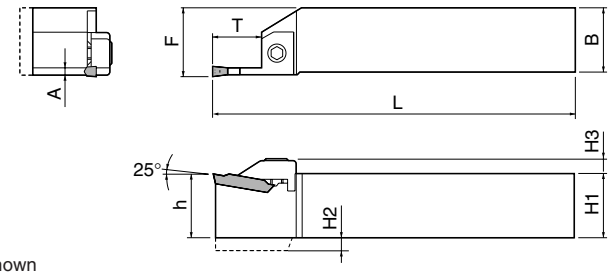
Shape		Description		Dimension (mm)						Insert Grade										
										Cermet				CVD Coated	PVD Coated		Carbide	Ceramic		
				W	B	R	A	L	H	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10		A65	A66N
 Ground Chipbreaker		GH	4020-02	4.0	-	0.2	-	20	7.5		○	○	●		○	●	●			
			4020-05			0.5					○	○	○		○	○	○		○	●
			4520-02	4.5	-	0.2	-	20	7.5			○								
			4520-05			0.5						○								
			5020-02	5.0	-	0.2	-	20	7.5		○	○	○		○	●	○			
			5020-05			0.5					○	○	○		○	○	○		○	●
			5520-02	5.5	-	0.2	-	20	7.5			○								
			5520-05			0.5						○								
			6020-02	6.0	-	0.2	-	20	7.5		○	○	○		○	●	○			
			6020-05			0.5					○	○	○		○	○	○		○	●
			6520-02	6.5	-	0.2	-	20	7.5			○								
			6520-05			0.5						○								
 Ceramic	 Shape of Ceramic Insert (Cutting Edge is chamfered : 0.1mm X 20°)		7020-02	7.0	-	0.2	-	20	7.5		○	○	●		○	○	○			
			7020-05			0.5					○	○	●		○	●	○		○	●
			7520-02	7.5	-	0.2	-	20	7.5			○								
			7520-05			0.5						○								
			8020-02	8.0	-	0.2	-	20	7.5		○	○	●		○	●	●			
			8020-05			0.5					○	○	●		○	●	○			●
			10025-05	10.0	-	0.5	-	25	7.5				○		○	○	○			
			12025-05	12.0	-	0.5	-	25	7.5				○		○	○	○			
 3-D Chipbreaker		GHU	4020	4.0	-	0.25	-	20	7.5	●				○						
			5020	5.0	-	0.30	-	20	7.5	●				○						
			6020	6.0	-	0.30	-	20	7.5	●				○						

Recommended Cutting Conditions ➡ P.261

External Deep Grooving Toolholders [GA Insert]

■ KGA





● Right-hand Shown

● Toolholder Dimension

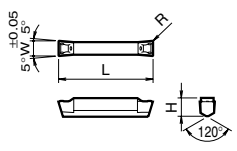
Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	T	Spare Parts Clamp	Clamp Bolt	Spring	Wrench
KGA R/L	2020K-3	○	○	20	5	6	20	125	37	21.5	2.3	20	CGA-3 R/L	HH6X20	SP-6	LW-5
	2525M-3	○	○	25	-	6	25	150	37	26.5	2.3	20				
	2020K-4	○		20	5	6	20	125	37	21.5	3.3	20	CGA-4 R/L	HH6X20	SP-6	LW-5
	2525M-4	○	○	25	-	6	25	150	37	26.5	3.3	20				
	2020K-5	○		20	5	6	20	125	42	21.5	4.3	25	CGA-5 R/L	HH6X20	SP-6	LW-5
	2525M-5	○	○	25	-	6	25	150	42	26.5	4.3	25				
KGA R/L	2020K-3S	●		20	5	6	20	125	34	21.5	2.3	16	CGA-3 R/L	HH6X20	SP-6	LW-5
	2525M-3S	●	●	25	-	6	25	150	34	26.5	2.3	16				
	2020K-4S	●		20	5	6	20	125	34	21.5	3.3	16	CGA-4 R/L	HH6X20	SP-6	LW-5
	2525M-4S	●	●	25	-	6	25	150	34	26.5	3.3	16				
	2020K-5S	○		20	5	6	20	125	39	21.5	4.3	20	CGA-5 R/L	HH6X20	SP-6	LW-5
	2525M-5S	○	○	25	-	6	25	150	39	26.5	4.3	20				

● Dimension T shows available Grooving Depth

● Clamp : CGA-○R for Right-hand Toolholder, CGA-○L for Left-hand Toolholder

● Applicable Insert

Toolholder	Insert
KGA R/L···3	GA30
KGA R/L···4	GA40
KGA R/L···5	GA50
KGA R/L···3S	GA30
KGA R/L···4S	GA40
KGA R/L···5S	GA50

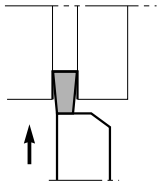
Shape		Description		Dimension (mm) W	B	R	A	L	H	Insert Grade: Cermet TN60	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Ceramic	Ceramic A65	Ceramic A66N
 3-D Chipbreaker		GA	30	3.0		0.20		25		○			●						
			40	4.0	-	0.25	-	25	5.0	○			●						
			50	5.0		0.30		30		○			○						

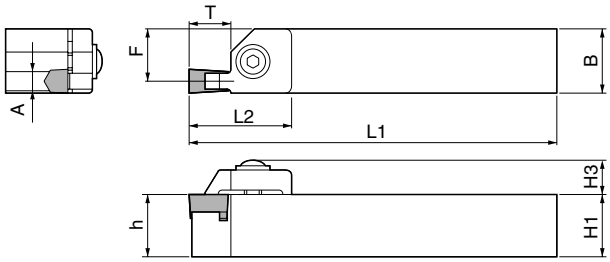
Recommended Cutting Conditions ➡ P.262

● : Std. Stock ○ : Check Availability

External Deep Grooving Toolholders [Ceramic GS Insert]

■ KN91





● Right-hand Shown

● Toolholder Dimension

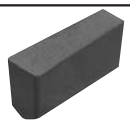
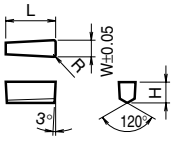
Description		Stock R	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	A	T	Spare Parts Clamp	Clamp Bolt	Washer	Spring	Wrench
KN91R/L	44-4	○	○	25	16	25	155	40	22.5	3.4	15	CE-111/121	BH8X30	W-8	SP-8	LW-5
	44-5	○	○	25	16	25	155	42	22.5	4.4	17					
	44-7	○	○	25	16	25	155	42	21	6.4	17	CE-131/141	BH8X30	W-8	SP-8	LW-5

● Dimension T shows available Grooving Depth

● Clamp : KN91R/L 44-4/5 ···CE-111 for Right-hand Toolholder, CE-121 for Left-hand Toolholder
KN91R/L 44-7···CE131 for Right-hand Toolholder, CE-141 for Left-hand Toolholder

● Applicable Insert

Toolholder	Insert
KN91R/L···4	GS91-4
KN91R/L···5	GS91-5 GS91-6
KN91R/L···7	GS91-7 GS91-8

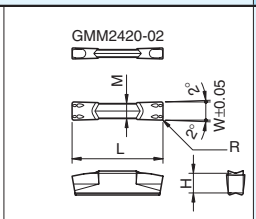
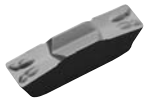
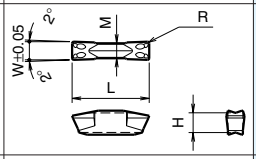
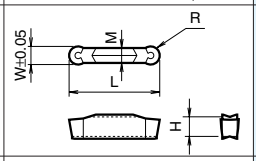
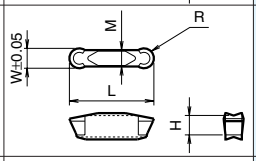
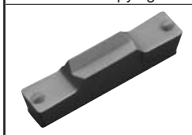
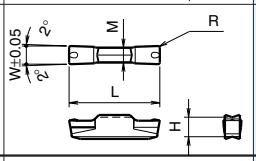
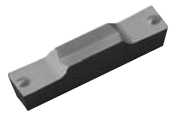
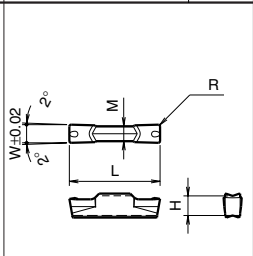
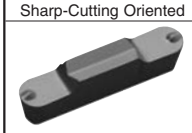
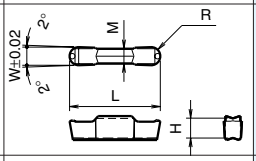
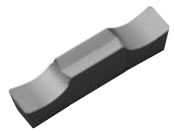
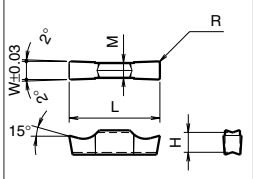
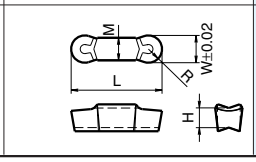
Shape		Description		Dimension (mm) W	B	R	A	L	H	Insert Grade: Cermet TN60	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Ceramic	Ceramic A65	Ceramic A66N
 Ceramic		GS	91-4	4.0	-	0.5	-	12	5.0									●	
			91-5	5.0															
			91-6	6.0		0.8		15	7.5										
			91-7	7.0															
			91-8	8.0														●	

◆ Recommended Cutting Conditions

Work Material	Recommended Insert Grade (Vc m/min) Ceramic SN60	Ceramic A65	f (mm/rev) GS 91-4	GS 91-5	GS 91-6	GS 91-7	GS 91-8
Cast Iron (FC · FCD etc.)	★ 200~600	☆ 150~300	0.03~ 0.07	0.03~ 0.07	0.03~ 0.07	0.04~ 0.08	0.04~ 0.08
High Hard Mat'l	-	★ 40~80	0.02~ 0.05	0.02~ 0.05	0.02~ 0.05	0.04~ 0.07	0.04~ 0.07

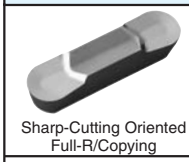
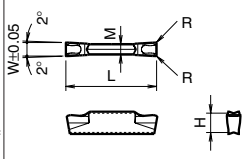
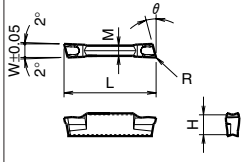
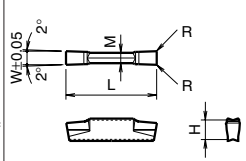
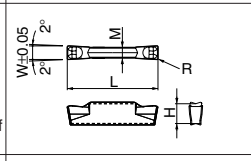
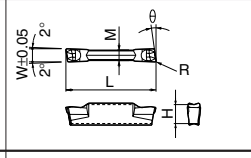
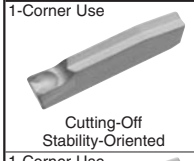
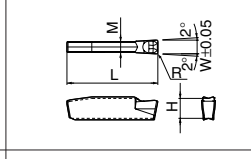
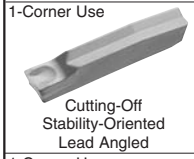
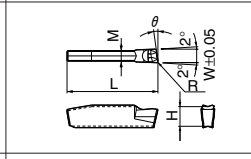
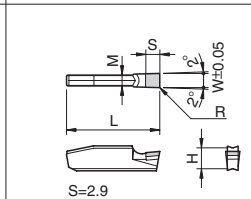
★ : 1st Recommendation · ☆ : 2nd Recommendation

Inserts for Multi-Function CERACUT Plunge & Turn

Shape		Description		Dimension (mm)					Angle(°)	Insert Grade								Ref. Page for Toolholder
										Cermet	CVD Coated	PVD Coated		Carbide	CBN	Diamond		
				W	R	L	H	M	θ	TN90	CR9025	PR915	PR930	KW10	KBN10B	KPD010	KPD001	
GMM2420-02  Chip Control Oriented		GMM	2420-02	2.4	0.2			1.9		●	●	●	●	○				221~3,278~9
			3020-04	3.0	0.4			2.3		●	●	●	●	●				221~6 278~9
			4020-04	4.0	0.4	20	4.3	3.3	-	●	●	●	●	●				
			5020-08	5.0	0.8			4.2		●	●	●	○	●				222~6,279
			6020-08	6.0	0.8			5.2		●	●	●	○	●				222~3,279
			8030-08	8.0	0.8	30	5.5	6.0			●	●	●	●				222,240~1258
 Chip Control Oriented		GMM	3014-04	3.0	0.4	14		2.3		●	●	●	●	●				226 240
			4017-04	4.0	0.4	17	4.3	3.3	-	●	●	●	●	●				240
			5017-08	5.0	0.8	17		4.2		●	●	●	●	●				
 Chip Control Oriented Full-R/Copying		GMM	3020-15R	3.0	1.5			2.3		●	●	●	○	○				221~6 278~9
			4020-20R	4.0	2.0	20	4.3	3.3	-	●	●	●	○	○				
			5020-25R	5.0	2.5			4.2		●	●	●	●	●				222~6,279
			6020-30R	6.0	3.0			5.2		●	●	●	●	○				222~3,279
 Chip Control Oriented Full-R/Copying		GMM	3014-15R	3.0	1.5	14		2.3		●	○		●	○				226 240
			4017-20R	4.0	2.0	17	4.3	3.3	-	●	●		○	○				240
			5017-25R	5.0	2.5	17		4.2		●	○		○	○				
 Sharp-Cutting Oriented		GMM	3020-02MS	3.0	0.2			2.3		●	●	●	●	○				221~6 278~9
			3020-04MS	3.0	0.4			2.3		●	●	●	●	○				
			4020-04MS	4.0	0.4	20	4.3	3.3	-	●	●	●	●	○				
			5020-04MS	5.0	0.4			4.2		○	●	●	●	○				222~6,279
			6020-04MS	6.0	0.4			5.2			●		●	○				222~3,279
 Sharp-Cutting Oriented		GMG	3020-00		0.0						●	○	○	○				
			3020-02	3.0	0.2	20	4.3	2.3	-	○	●	○	○	●				
			3020-04		0.4					○	○	○	○	○				221~6 278~9
			4020-02		0.2					○	○	○	○	○				
			4020-04	4.0	0.4	20	4.3	3.3	-	●	●	○	○	○				
			4020-08		0.8					○	○	○	●	○				
			5020-04	5.0	0.4	20	4.3	4.2	-	●	○	○	○	○				222~6 279
			5020-08		0.8						○	○	●	○				
			6020-04	6.0	0.4	20	4.3	5.2	-		○		○	○				222~3 279
			6020-08		0.8						○		○	○				
 Sharp-Cutting Oriented Full-R/Copying		GMG	3020-15R	3.0	1.5			2.3		●	●		○	○				221~6 278~9
			4020-20R	4.0	2.0	20	4.3	3.3	-	●	●		○	○				
			5020-25R	5.0	2.5			4.2			○		○	○				222~6,279
			6020-30R	6.0	3.0			5.2			○		○	○				222~3,279
 Sharp-Cutting Oriented Ground Chipbreaker		GMG	2520-03MG	2.5	0.3			2.0		○	○	○	○	●				221~3,278~9
			3020-03MG	3.0	0.3			2.3		●	●	○	●	●				221~6 278~9
			3520-03MG	3.5	0.3	20	4.3	2.8	-	○	●	○	○	○				
			4020-04MG	4.0	0.4			3.3		○	●	○	●	●				
			5020-04MG	5.0	0.4			4.2		○	○	○	○	○				222~6,279
			6020-04MG	6.0	0.4			5.2		○	○		○	●				222~3,279
			8030-05MG	8.0	0.5	30	5.5	6.0	-	○	○		○	●				222,240~1258
 Sharp-Cutting Oriented Full-R/Copying		GMGA	6020-30R	6.0	3.0	20	4.3	4.3	-					●				222~3 279

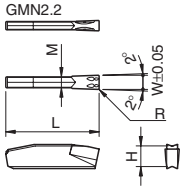
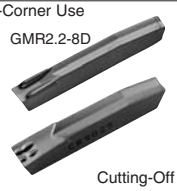
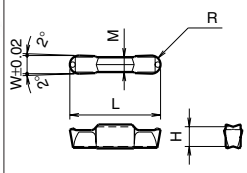
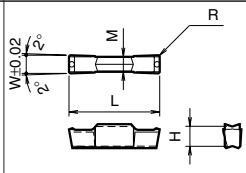
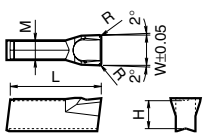
● : Std. Stock ○ : Check Availability

■ Inserts for Multi-Function CERACUT Plunge & Turn

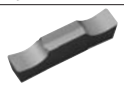
Shape (Handed Insert Shows Right-hand)	Description		Dimension (mm) W	R	L	H	M	Angle(°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001	Ref. Page for Toolholder
 Sharp-Cutting Oriented Full-R/Copying		**GMGA 8030-40R**	8.0	4.0	30	5.5	6.0	-					●				222 240～1 258
 Deep Grooving/Cutting-Off Sharp-Cutting Oriented		**GMM 1520-MT**	1.5	0.0 0.05	20	4.3	1.2	-			●	●	○				221,278～9
		2020-MT	2.0	0.0 0.05	20	4.3	1.5	-		●	●	●	●				221,223 278～9
		2520-MT	2.5	0.0 0.05	20	4.3	1.9	-		○	●	●	○				
		3020-MT	3.0	0.0 0.05	20	4.3	2.3	-		●	●	●	○				221～6 278～9
 Cutting-Off Sharp-Cutting Oriented Lead Angled		**GMM 1520ℝ-MT-15D**	1.5	0.0 0.05	20	4.3	1.2	15°			R	●	○				221,278~9
		2020ℝ-MT-8D	2.0	0.0 0.05	20	4.3	1.2	15°				R					
		2020ℝ-MT-15D	2.0	0.0 0.05	20	4.3	1.5	15°		○	R	●	●				221,223 278～9
		2520ℝ-MT-15D	2.5	0.0 0.05	20	4.3	1.9	15°		○	R	●	○				
		3020ℝ-MT-4D	3.0	0.0 0.05	20	4.3	2.3	4°				●					
		3020ℝ-MT-15D	3.0	0.0 0.05	20	4.3	2.3	15°		●	R		●				221～6 278～9
 Deep Grooving/Cutting-Off Sharp-Cutting Oriented Without Chipbreaker		**GMM 1520-NB**	1.5	0.0 0.05	20	4.3	1.2	-				○	●				221,278~9
		2020-NB	2.0	0.0 0.05	20	4.3	1.5	-		●		●	●				221,223 278～9
		2520-NB	2.5	0.0 0.05	20	4.3	1.9	-		○		○	○				
		3020-NB	3.0	0.0 0.05	20	4.3	2.3	-		○		●	●				221～6 278～9
 Deep Grooving/Cutting-Off Stability-Oriented		**GMM 2020-TK**	2.0	0.20			1.5				●	○	○				221,223 278～9
		2520-TK	2.5	0.20	20	4.3	1.9	-		○	●	○	○				
		3020-TK	3.0	0.25			2.3			●	●	○	○				221～6 278～9
 Cutting-Off Stability-Oriented Lead Angled		**GMM 2020ℝ-TK-8D**	2.0	0.20			1.5	8°			R	R	R				221,223 278～9
		2520ℝ-TK-8D	2.5	0.20	20	4.3	1.9	8°		R	R	R	R				
		3020ℝ-TK-8D	3.0	0.25			2.3	8°		R	R	R	R				221～6 278～9
1-Corner Use  Cutting-Off Stability-Oriented		**GMN 2-TK**	2.0	0.20			1.8	-			○	○	○				221,223 278～9
		3-TK	3.0	0.25	20	4.3	2.3	-		○	○	○	○				221～6 278～9
		4-TK	4.0	0.30			3.3	-		○	○	○	○				
1-Corner Use  Cutting-Off Stability-Oriented Lead Angled		**GMℝ 2-TK-8D**	2.0	0.20			1.8	8°			R	R	R				221,223 278～9
		3-TK-8D	3.0	0.25	20	4.3	2.3	8°		R	R	R	R				221～6 278～9
		4-TK-8D	4.0	0.30			3.3	8°		R	R	R	R				
1-Corner Use  Deep Grooving	 S=2.9	**GMN 2**	2.0	0.2 0.4	20	4.3	1.8	-						○	○	○	221,223
		3	3.0	0.2 0.4	20	4.3	2.3	-						●	●	○	221～226
		4	4.0	0.2 0.4	20	4.3	3.3	-						●	○	○	
		5	5.0	0.2 0.4	20	4.3	4.2	-						●	●	○	222～226
		6	6.0	0.2 0.4	20	4.3	5.2	-						○	○		222～3

● : Std. Stock ○ : Check Availability R : R-hand Only

■ Inserts for Multi-Function CERACUT Plunge & Turn

Shape (Handed Insert Shows Right-hand)	Description		Dimension (mm) W	R	L	H	M	Angle(°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001	Ref. Page for Toolholder
1-Corner Use  GMN2.2  Deep Grooving / Cutting Off Sharp-Cutting Oriented	GMN2.2	GMN	2.2	2.2	0.17			1.8		●	●		●	●				221,223,278~9
			3	3.0	0.20			2.3		○	●		○	●				221~6 278~9
			4	4.0	0.25	20	4.3	3.3	-	○	●		○	○				
			5	5.0	0.8			4.2			●		○	○				222~6,279
			6	6.0	0.8			5.2			●		○	○				222~3,279
1-Corner Use  GMR2.2-8D Cutting-Off Sharp-Cutting Oriented Lead Angled	GMR2.2-8D	GM R/L	2.2-8D	2.2	0.17			1.8	8°	●	●		●	●				221,223 278~9
			2.2-15D	2.2	0.00			1.8	15°	●	R		●	●				
			3-4D	3.0	0.20	20	4.3	2.3	4°	R	●		●	●				221~6 278~9
			3-15D	3.0	0.20			2.3	15°		●							
			4-4D	4.0	0.25			3.3	4°	R	●		R	R				
 Undercutting Chip Control Oriented		GMM	3014-15RU	3.0	1.5	14	4.3	2.3	-		○		●	○				226
		GMG	3020-15RU	3.0	1.5			2.3			●		●	○				
			4020-20RU	4.0	2.0	20	4.3	3.3	-		○		○	○				225~227
			5020-25RU	5.0	2.5			4.2			○		○	○				
 Face Grooving Chip Control Oriented		FGG R/L	3020-02	3.0	0.2			2.3			●		R	○				
			4020-04	4.0	0.4	20	4.3	3.3	-		○		R	○				225~227
			5020-04	5.0	0.4			4.2			○		○	○				
FMM20-02  Face Grooving Chip Control Oriented	FMM20-02	FMM	20-02	2.0	0.2			1.4		○	●		○	○				
			30-03	3.0	0.3			2.0		○	●	○	●	●				
			40-04	4.0	0.4	12	3.5	2.6	-	○	●	○	●	●				
			50-04	5.0	0.4			3.4		○	●	○	●	●				
			60-04	6.0	0.4			4.0		○	●		●	●				256~257
 Face Grooving Sharp-Cutting Oriented		FMN	3	3.0				2.0		○	○		○	○				
			4	4.0				2.6		○	○		○	○				
			5	5.0	0.25	12	3.5	3.4	-	○	○		○	○				
			6	6.0				4.0			○		○	○				

■ Multi-Function CERACUT Plunge & Turn Chipbreakers

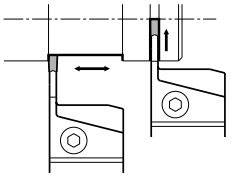
Application	Type	Shape		Advantages
Finishing~Medium General Grooving	GMM		2-corner	Negative and Strong Edge, Good Chip Control At the traversing of a*p*=0.5 - 2.5mm, f=0.05 - 0.20mm/rev, it shows good chip control performance. Grooving, traversing and cut-off operations are available.
Medium~Roughing Precision Grooving	GMG GMM-MS		2-corner	Positive Edge, Less Cutting Resistance, Sharp Cutting At the traversing of a*p*=1.5 - 3.0mm, f=0.10 - 0.25mm/rev., it shows excellent chip control performance. Grooving, traversing and cutting-off operations are available.
Finishing Precision Grooving	GMG-MG		2-corner	Ground Chipbreaker and Sharp Cutting Performance. No chattering at even thin work and smooth grooving is available.
Deep Grooving	GMN		1-corner	Mainly for Deep Grooving. Groove width expansion and traversing are available due to the projection nearby side cutting edge. 1-corner use and wide cutting range. Cutting-off operation is also available.

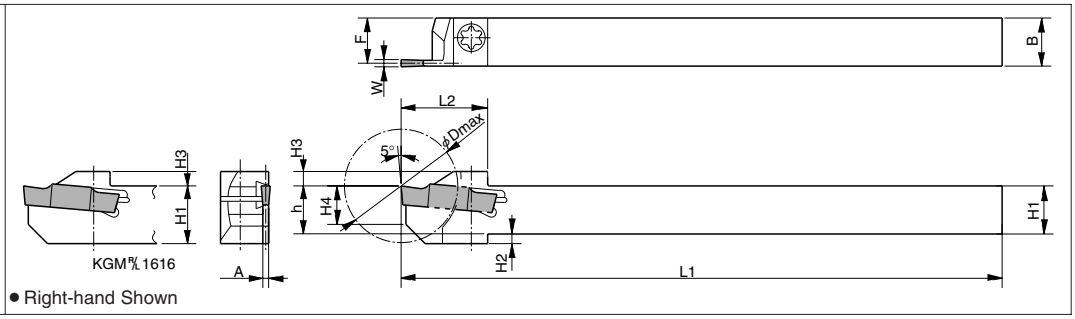
● : Std. Stock ○ : Check Availability

External Grooving Toolholders CERACUT Plunge & Turn

■ KGM (For Automatic Lathe / Long Shank type)

Width : 1.5～3.0mm





● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Cutting Dia. φDmax	Dimension (mm) H1=h	H2	H3	H4	B	L1	L2	F	A	Width W(mm) MIN.	MAX.	Spare Parts Screw	Wrench
KGM□	0810K-1.5-125	●	●	10	8	4	3	8	10	125	18	9.4	1.2				
	1010K-1.5-125	●	●	20	10	2	3	8	10	125	18	9.4	1.2	1.5	2.0	SE-40120TR	LTW-15S
	1212M-1.5-150	●	●	25	12	2	4	10	12	150	20.5	11.4	1.2				
	0810K-2-125	●	●	10	8	4	3	8	10	125	18	9.2	1.6				
	1010K-2-125	●	●	20	10	2	3	8	10	125	18	9.15	1.7	2.0	3.0	SE-40120TR	LTW-15S
	1212M-2-150	●	●	25	12	2	4	10	12	150	19	11.15	1.7				
	1616M-2-150	●	●	32	16	-	4	9	16	150	24.5	15.15	1.7			SE-50125TR	LTW-20
	1010K-2.5-125	●	●	20	10	2	3	8	10	125	18	9	2.0			SE-40120TR	LTW-15S
	1212M-2.5-150	●	●	25	12	2	4	10	12	150	20.5	11	2.0	2.4	3.0		
	1616M-2.5-150	●	●	32	16	-	4	9	16	150	25.5	15	2.0			SE-50125TR	LTW-20
	1616M-3-150	●	●	32	16	-	4	9	16	150	25.5	14.8	2.4	3.0	4.0	SE-50125TR	LTW-20

● Applicable Insert

Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off
Ref. Page	218	218	218	218	219	219	219	219	219～210
Shape / Toolholder		MS	MG		MT	NB	TK	TK	
KGM□…1.5	-	-	-	-	GMM1520..MT GMM2020..MT GMM1520□..MT GMM2020□..MT	GMM1520..NB GMM2020..NB	GMM2020..TK GMM2020□..TK	GMN2..TK GM□2..TK	-
KGM□…2	GMM2420.. GMG3020.. GMM3020..	GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	GMM2020..MT GMM2520..MT GMM3020..MT GMM2020□..MT GMM2520□..MT GMM3020□..MT	GMM2020..NB GMM2520..NB GMM3020..NB	GMM2020..TK GMM2520..TK GMM3020..TK GMM2020□..TK GMM2520□..TK GMM3020□..TK	GMN2..TK GMN3..TK GM□2..TK GM□3..TK	GMN2 GMN2.2 GMN3 GM□2.2 GM□3
KGM□…2.5	GMM2420.. GMG3020.. GMM3020..	GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	GMM2520..MT GMM3020..MT GMM2520□..MT GMM3020□..MT	GMM2520..NB GMM3020..NB	GMM2520..TK GMM3020..TK GMM2520□..TK GMM3020□..TK	GMN3..TK GM□3..TK	GMN3 GM□3
KGM□…3	GMG3020.. GMM3020.. GMG4020.. GMM4020..	GMM3020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	GMM3020..MT GMM3020□..MT	GMM3020..NB	GMM3020..TK GMM3020□..TK	GMN3..TK GMN4..TK GM□3..TK GM□4..TK	GMN3 GMN4 GM□3 GM□4

Recommended Cutting Conditions ➡ P.263

■ Multi-Function CERACUT Plunge & Turn Chipbreakers

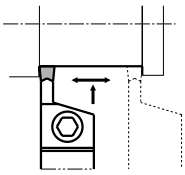
Application	Type	Shape		Advantages
Cutting-Off Deep Grooving	GMM-MT		2-corner	Chipbreaker developed for cutting-off operation with sharp cutting performance at automatic lathe and so on. It can minimize the core which remains in the center of the face.
Cutting-Off Deep Grooving	GMM-NB		2-corner	Flat Rake Face and Non-Chipbreaker type. It works well for Copper, brass and so on.
Cutting-Off Deep Grooving	GMM-TK		2-corner	Chipbreaker for Cutting-off and Large Corner-R. Stable Performance. 2-corner use and recommended for cost-cut.
Cutting-Off Deep Grooving	GMN-TK		1-corner	Similar chipbreaker shape to GMM-TK tool. 1-corner use and wide cutting range.

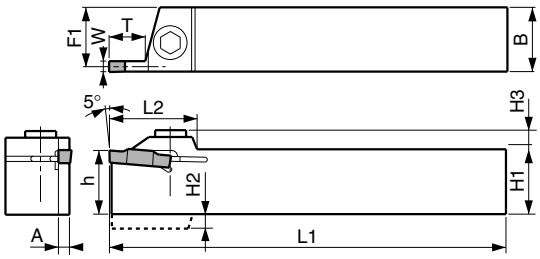
● : Std. Stock ○ : Check Availability

External Grooving Toolholders — CERACUT Plunge & Turn

■ KGM

Width : 3.0～8.0mm





● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	T	Width W(mm) MIN.	MAX.	Spare Parts: Screw	Screw	Wrench	Wrench
KGM□	1212H-3	●	●	12	4	5	12	100	27	10.8	2.4	8	3.0	3.0	SB-5TR	-	LTW-20	-
	1616H-3	●	●	16	4	5	16	100	27	14.8	2.4	8	3.0	4.0	-	HH5X16	-	LW-4
	2020K-3	●	●	20	-	6	20	125	27	18.8	2.4	9						
	2525M-3	●	●	25	-	6	25	150	27	23.8	2.4	9				HH5X25		
	2020K-4	●	●	20	-	6	20	125	27	18.3	3.4	10	4.0	5.0	-	HH5X16	-	LW-4
	2525M-4	●	●	25	-	6	25	150	27	23.3	3.4	10				HH5X25		
	2020K-5	●	●	20	-	6	20	125	27	17.8	4.4	10	5.0	6.0	-	HH5X16	-	LW-4
	2525M-5	●	●	25	-	6	25	150	27	22.8	4.4	10				HH5X25		
	3232P-5	●	○	32	-	6	32	170	27	29.8	4.4	10						
	2525M-8	●	●	25	7.5	8	25	150	40	22.0	6.0	25	8.0	8.0	-	HH6X25	-	LW-5
	3232P-8	●	●	32	-	8	32	170	40	29.0	6.0	25						

● Dimension T shows available Grooving Depth

● 4.0mm Width Insert can be installed to KGM□ 1212H-3, but the Machining with such combination is not recommended due to the Tooholder's rigidity problem.

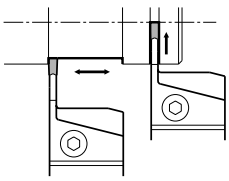
● Applicable Insert

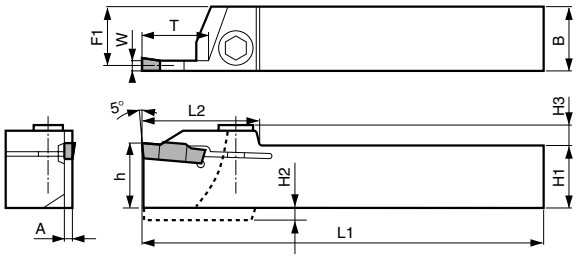
Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Full-R/Copying	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off
Ref. Page	218	218	218	218	218～9	219	219	219	219	219～220
Shape / Toolholder		MS	MG			MT	NB	TK	TK	
KGM□…3	GMG3020.. GMM3020.. GMG4020.. GMM4020..	GMM3020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	-	GMM3020..MT GMM3020□..MT	GMM3020..NB	GMM3020..TK GMM3020□..TK	GMN3..TK GMN4..TK GM□3..TK GM□4..TK	GMN3 GMN4 GM□3 GM□4
KGM□…4	GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM4020..MS GMM5020..MS	GMG4020..MG GMG5020..MG	GMG4020..R GMM4020..R GMG5020..R GMM5020..R	-	-	-	-	GMN4..TK GM□4..TK	GMN4 GMN5 GM□4
KGM□…5	GMG5020.. GMM5020.. GMG6020.. GMM6020..	GMM5020..MS GMM6020..MS	GMG5020..MG GMG6020..MG	GMG5020..R GMM5020..R GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN5 GMN6
KGM□…8	GMM8030..	-	GMG8030..MG	-	GMGA8030..R	-	-	-	-	-

Recommended Cutting Conditions ➡ P.263

● : Std. Stock ○ : Check Availability

■ KGM-T (For Deep Grooving)





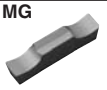
● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	T		Width W(mm) MIN.	MAX.	Spare Parts Screw		Wrench	
KGM□	2012K-2T17	○	○	20	-	6	12	125	33	11.15	1.7	17				SB-5TR	-	LTW-20	-
	2020K-2T17	●	●	20	-	6	20	125	33	19.15	1.7	17		2.0	2.5	-	HH5X16	-	LW-4
	2525M-2T17	●	●	25	-	6	25	150	33	24.15	1.7	17					HH5X25		
	1616H-3T20	●	●	16	4	6	16	100	36	14.8	2.4	20				-	HH5X16	-	LW-4
	2012K-3T20	○	○	20	-	6	12	125	36	10.8	2.4	20		3.0	4.0	SB-5TR	-	LTW-20	-
	2020K-3T20	●	●	20	-	6	20	125	36	18.8	2.4	20				-	HH5X16	-	LW-4
	2525M-3T20	●	●	25	-	6	25	150	36	23.8	2.4	20					HH5X25		
	2020K-4T20	●	●	20	-	6	20	125	36	18.3	3.4	20				-	HH5X16	-	LW-4
	2525M-4T20	●	●	25	-	6	25	150	36	23.3	3.4	20		4.0	5.0		HH5X25		
	2525M-4T25	●	●	25	-	6	25	150	41	23.3	3.4	25							
	2525M-5T25	●	●	25	-	6	25	150	42	22.8	4.4	25		5.0	6.0	-	HH5X25	-	LW-4
	3232P-5T25	○	○	32	-	6	32	170	42	29.8	4.4	25							
	2525M-6T30	●	●	25	-	6	25	150	45	22.4	5.2	30		6.0	6.0	-	HH5X25	-	LW-4

● T Dimension shows the Distance from the Toolholder to the Cutting Edge. See the Table(P224) for the Relationship between the available Grooving Depth and the Cutting Dia..
● When using GMG/GMM type 2-corner use Insert, set up the Groove Depth under 15mm.

● Applicable Insert

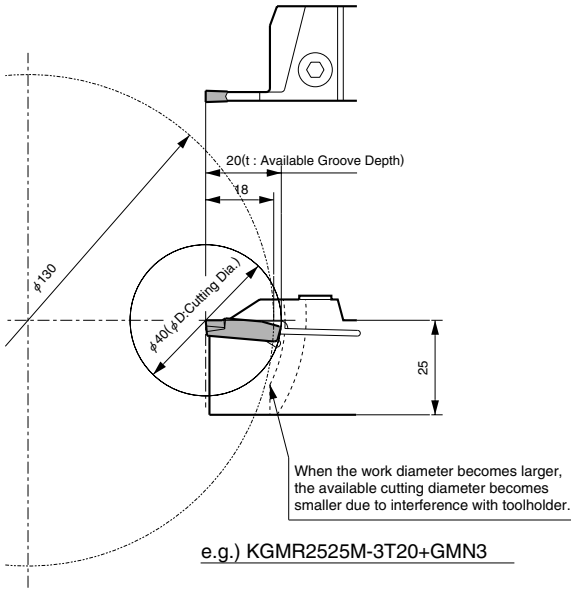
Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Full-R/Copying	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off	Deep Grooving/Cut-Off
Ref. Page	218	218	218	218	218～9	219	219	219	219	219～220
Shape / Toolholder		MS 	MG 			MT 	NB 	TK 	TK 	
KGM□…2T	GMM2420..	-	GMG2520..MG	-	-	GMM2020..MT GMM2520..MT GMM2020□..MT GMM2520□..MT	GMM2020..NB GMM2520..NB	GMM2020..TK GMM2520..TK GMM2020□..TK GMM2520□..TK	GMN2..TK GM□2..TK	GMN2 GMN2.2 GM□2.2
KGM□…3T	GMG3020.. GMM3020.. GMG4020.. GMM4020..	GMM3020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	-	GMM3020..MT GMM3020□..MT	GMM3020..NB	GMM3020..TK GMM3020□..TK	GMN3..TK GMN4..TK GM□3..TK GM□4..TK	GMN3 GMN4 GM□3 GM□4
KGM□…4T	GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM4020..MS GMM5020..MS	GMG4020..MG GMG5020..MG	GMG4020..R GMM4020..R GMG5020..R GMM5020..R	-	-	-	-	GMN4 GM□4..TK	GMN4 GMN5 GM□4
KGM□…5T	GMG5020.. GMM5020.. GMG6020.. GMM6020..	GMM5020..MS GMM6020..MS	GMG5020..MG GMG6020..MG	GMG5020..R GMM5020..R GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN5 GMN6
KGM□…6T	GMG6020.. GMM6020..	GMM6020..MS	GMG6020..MG	GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN6

Recommended Cutting Conditions P.263

External Grooving Toolholders CERACUT Plunge & Turn

◆ Available Cutting Diameter of KGM / KGM-T type

There is a limit to available grooving depth depending on the workpiece diameter.



◆ KGM Available Cutting Diameter Table

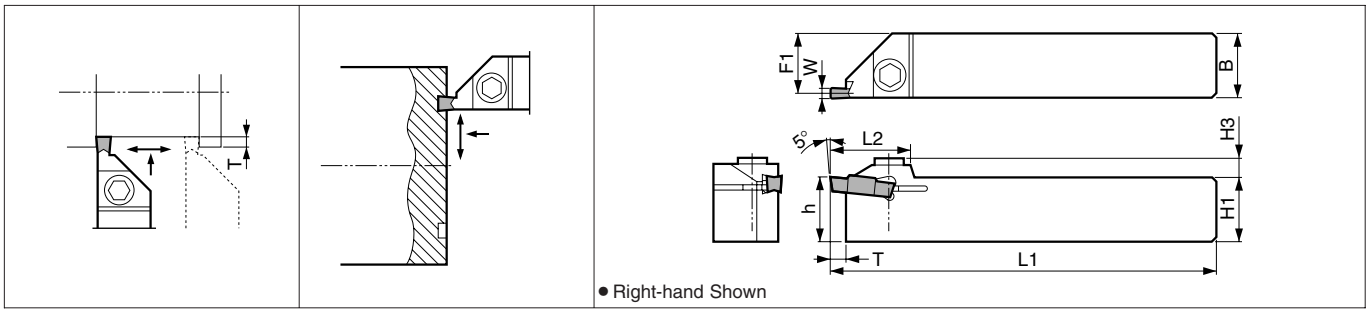
Toolholder		φD (Cutting Dia.)																
KGM型	0810K-1.5-125	-	-	-	-	-	-	-	-	-	-	-	-	10	14	16	32	∞
	1010K-1.5-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-1.5-150	-	-	-	-	25	26	28	32	36	40	60	100	∞	∞	∞	∞	∞
	0810K-2-125	-	-	-	-	-	-	-	-	-	-	-	-	10	14	16	32	∞
	1010K-2-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-2-150	-	-	-	-	25	26	28	50	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1616M-2-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1010K-2.5-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-2.5-150	-	-	-	-	25	26	28	32	36	40	60	100	∞	∞	∞	∞	∞
	1616M-2.5-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1616M-3-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
Available Grooving Depth: t (mm)		16	15	14	13	12.5	12	11	10	9	8	7	6	5	4	3	2	1

◆ KGM-T Available Cutting Diameter Table (GMN · GM型 When using 1-corner use type)

Toolholder		φD (Cutting Dia.)												
KGM型	2012K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2020K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2525M-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	1616H-3T20	-	-	-	-	-	40	54	70	100	180	∞	∞	∞
	2012K-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2020K-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2020K-4T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-4T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-4T25	-	-	50	140	240	∞	∞	∞	∞	∞	∞	∞	∞
	2525M-5T25	-	-	50	140	240	∞	∞	∞	∞	∞	∞	∞	∞
	3232P-5T25	-	-	50	280	600	∞	∞	∞	∞	∞	∞	∞	∞
	2525M-6T30	100	300	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
Available Grooving Depth: t (mm)		30	27	25	23	22	20	19	18	17	16	15	14	under 13

External Grooving (External/Face Grooving)Toolholders CERACUT Plunge & Turn

■ KGMM



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	T	Width W(mm) MIN.	MAX.	Spare Parts Screw	Screw	Wrench	Wrench
KGMM R/L	1212H-3	○	○	12	5	12	100	25	11.15	4.8	3.0	5.0	SB-5TR	-	LTW-20	-
	1616H-3	○	○	16	5	16	100	25	15.15	4.8			-	HH5X16	-	LW-4
	2020K-3	●	○	20	6	20	125	25	18.8	4.8			-	HH5X16	-	LW-4
	2525M-3	○	●	25	6	25	150	25	23.8	4.8			-	HH5X25	-	LW-4

● Applicable Insert [External Grooving]

● Dimension T shows available Grooving Depth (In case of Face Grooving, See the Table below.)

Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Grooving	Grooving	Grooving	Grooving	Grooving	
Ref. Page	218	218	218	218	219	219	219	219	219～220	
Shape / Toolholder		MS	MG		MT	NB	TK	TK		
KGMM R/L···3	GMG3020.. GMM3020.. GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM3020..MS GMM4020..MS GMM5020..MS	GMG3020..MG GMG3520..MG GMG4020..MG GMG5020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R GMG5020..R GMM5020..R	GMM3020..MT	GMM3020..NB	GMM3020..TK	GMN3..TK GMN4..TK	GMN3 GMN4 GMN5	

● Applicable Insert [Face Grooving]

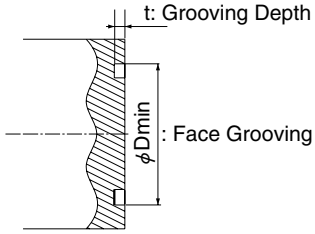
Application	Grooving/Traversing	Grooving/Traversing	Grooving/Traversing	Grooving/Traversing	Grooving	Grooving/Traversing	Grooving	Grooving	Grooving	Grooving
Ref. Page	220	220	218	218	218	218	219	219	219	219～220
Shape / Toolholder				MS	MG		MT	NB	TK	
KGMM R/L···3	FGG R/L 3020.. FGG R/L 4020.. FGG R/L 5020..	GMG3020..RU GMG4020..RU GMG5020..RU	GMG3020.. GMM3020.. GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM3020..MS GMM4020..MS GMM5020..MS	GMG3020..MG GMG3520..MG GMG4020..MG GMG5020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R GMG5020..R GMM5020..R	GMM3020..MT	GMM3020..NB	GMM3020..TK	GMN3 GMN4 GMN5 GMN3..TK GMN4..TK

Recommended Cutting Conditions ➡ P.263

◆ Selection of Insert & Toolholder (Face Grooving)

Toolholder	L-hand	Toolholder	R-hand
Insert	L-hand	Insert	R-hand
Toolholder	R-hand	Toolholder	L-hand
Insert	L-hand	Insert	R-hand

◆ Min. Cutting Dia. (Face Grooving)

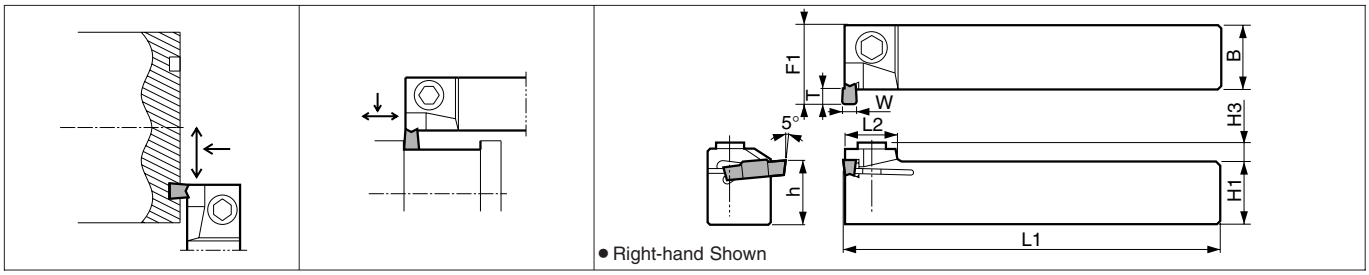


Description	φDmin	t
GMG/GMM3020-○○□□	φ100	4.0
GMG/GMM4020-○○□□	φ100	4.0
GMG/GMM5020-○○□□	φ100	4.0
FGG R/L 3020-02	φ22	3.5
FGG R/L 4020-04	φ28	4.0
FGG R/L 5020-04	φ30	4.0
GMG3020-15RU	φ22	3.0
GMG4020-20RU	φ28	4.0
GMG5020-25RU	φ30	4.0

● : Std. Stock ○ : Check Availability

External Grooving (External/Face Grooving)Toolholders CERACUT Plunge & Turn

■ KGMS



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	T				Width W(mm) MIN.	MAX.	Spare Parts Screw GS	Screw SB	Screw	Wrench	Wrench
KGMS R/L	1212H-3	●	○	12	5	12	100	17	17	4.8				3.0	3.0	SB-5TR	-		LTW-20	-
	1616H-3	●	●	16	5	16	100	17	21.5	4.8						GS-50	-		-	LW-3
	2020K-3	●	○	20	6	20	125	17	25	4.8				3.0	5.0	-	HH5X16		-	LW-4
	2525M-3	●	●	25	6	25	150	17	30	4.8						-	HH5X25		-	LW-4

● Applicable Insert [External Grooving]

● Dimension T shows available Grooving Depth (In case of Face Grooving, See the Table below.)

Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Grooving	Grooving	Grooving	Grooving	Grooving	
Ref. Page	218	218	218	218	219	219	219	219	219～220	
Shape / Toolholder		MS	MG		MT	NB	TK	TK		
KGMS R/L 1212H-3	GMM3014..	-	-	GMM3014..R	-	-	-	-	-	
KGMS R/L 1616H-3 2020K-3 2525M-3	GMG3020.. GMM3020.. GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM3020..MS GMM4020..MS GMM5020..MS	GMG3020..MG GMG3520..MG GMG4020..MG GMG5020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R GMG5020..R GMM5020..R	GMM3020..MT	GMM3020..NB	GMM3020..TK	GMN3..TK GMN4..TK	GMN3 GMN4 GMN5	

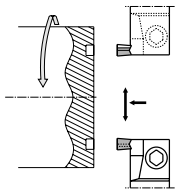
● Applicable Insert [Face Grooving]

Application	Grooving/Traversing	Grooving/Traversing	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R/Copying	Grooving	Grooving	Grooving	Grooving
Ref. Page	220	220	218	218	218	218	219	219	219	219～220
Shape / Toolholder				MS	MG		MT	NB	TK	
KGMS R/L 1212H-3	-	GMM3014..RU	-	-	-	-	-	-	-	
KGMS R/L 1616H-3 2020K-3 2525M-3	FGG R/L 3020.. FGG R/L 4020.. FGG R/L 5020..	GMG3020..RU GMG4020..RU GMG5020..RU	GMG3020.. GMM3020.. GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM3020..MS GMM4020..MS GMM5020..MS	GMG3020..MG GMG3520..MG GMG4020..MG GMG5020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R GMG5020..R GMM5020..R	GMM3020..MT	GMM3020..NB	GMM3020..TK	GMN3 GMN4 GMN5 GMN3..TK GMN4..TK

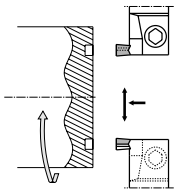
Recommended Cutting Conditions ➡ P.263

◆ Selection of Insert & Toolholder (Face Grooving)

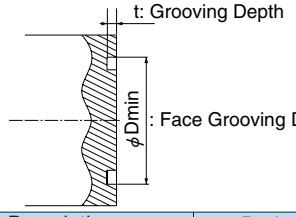
Toolholder	R-hand
Insert	L-hand



Toolholder	L-hand
Insert	R-hand



◆ Min. Cutting Dia. (Face Grooving)

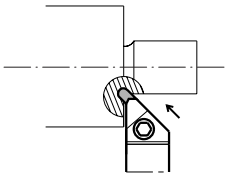


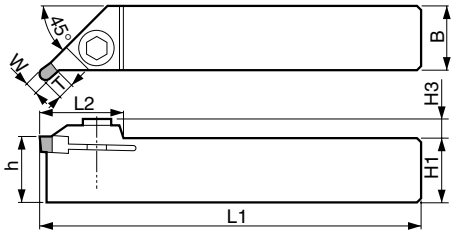
Description	φDmin	t
GMG/GMM30○○-○○□□	φ100	4.0
GMG/GMM4020-○○□□	φ100	4.0
GMG/GMM5020-○○□□	φ100	4.0
FGG R/L 3020-02	φ22	3.5
FGG R/L 4020-04	φ28	4.0
FGG R/L 5020-04	φ30	4.0
GMG30○○-15RU	φ22	3.0
GMG4020-20RU	φ28	4.0
GMG5020-25RU	φ30	4.0

● : Std. Stock ○ : Check Availability

External Undercutting Toolholders CERACUT Plunge & Turn

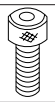
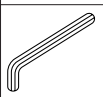
■ KGMU





● Right-hand Shown

● Toolholder Dimension

Description	Stock		Dimension (mm)										Width W(mm)		Spare Parts			
															Screw		Wrench	
	R	L	H1=h	H3	B	L1	L2	T					MIN.	MAX.				
KGMU R/L 2020K	○	○	20	6	20	125	25	4.8					3.0	5.0	HH5X16		LW-4	
KGMU R/L 2525M	○	○	25	6	25	150	25	4.8					3.0	5.0	HH5X25		LW-4	

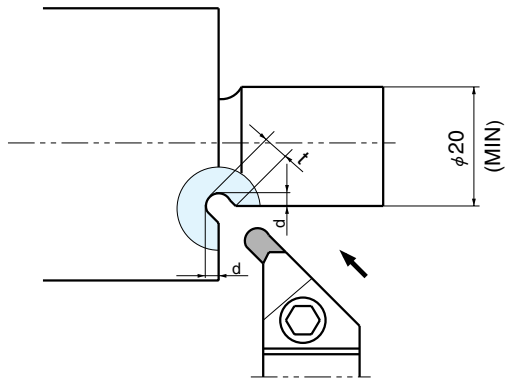
● T Dimension shows the Distance from the Toolholder to the Cutting Edge. See the Table below for the available Grooving Depth.

● Applicable Insert

Application	Undercutting										
Ref. Page	220										
Shape / Toolholder											
KGMU R/L 2020K 2525M	GMG3020..RU GMG4020..RU GMG5020..RU										

◆ Undercutting Depth: t

Recommended Cutting Conditions P.263

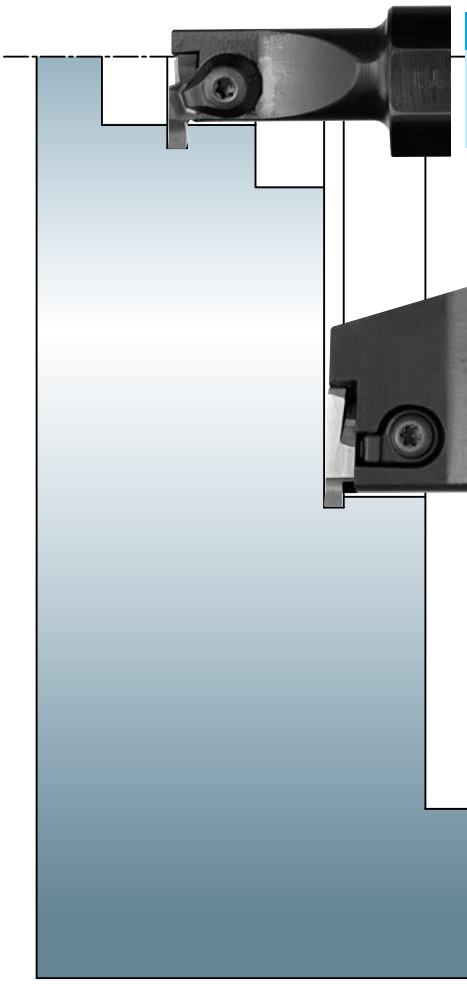


Description	Undercutting Depth t (mm)	Distance from Surface d(mm)
GMG3020-15RU	3.5	1.8
GMG4020-20RU	4.0	1.9
GMG5020-25RU	4.5	2.1

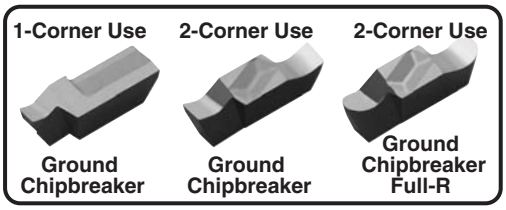
● In case of the Undercut for the Diameter over 100mm,
External Grooving Inserts GMG○○20-○○, GMM○○20-○○□□, GMN○
are also available.

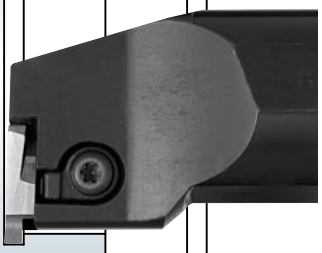
Summary of Internal Grooving

■ Internal Grooving ϕ12～

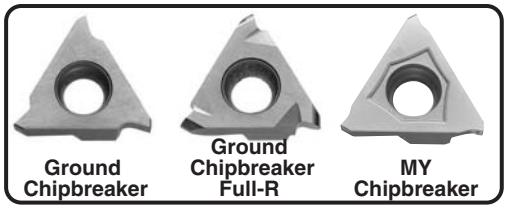


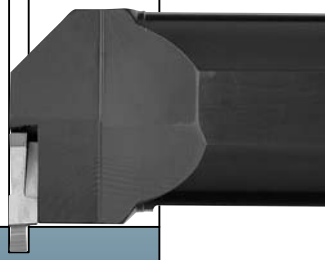
GIV
Min. Cutting Dia.: ϕ12～40
Width: 1.0～5.0
Depth: 1.7～5.5
➡P.232





KIGBA
Min. Cutting Dia.: ϕ35～40
Width: 0.5～4.8
Depth: 1.0～2.8
➡P.236

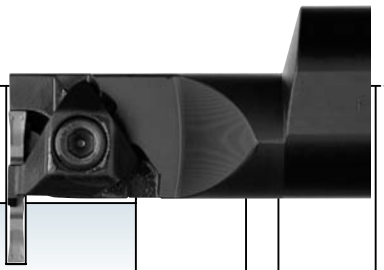




KITG
Min. Cutting Dia.: ϕ35～45
Width: 0.75～4.5
Depth: 2.0～2.5
➡P.235

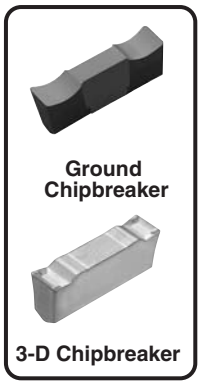
Shallow Grooving

Deep Grooving



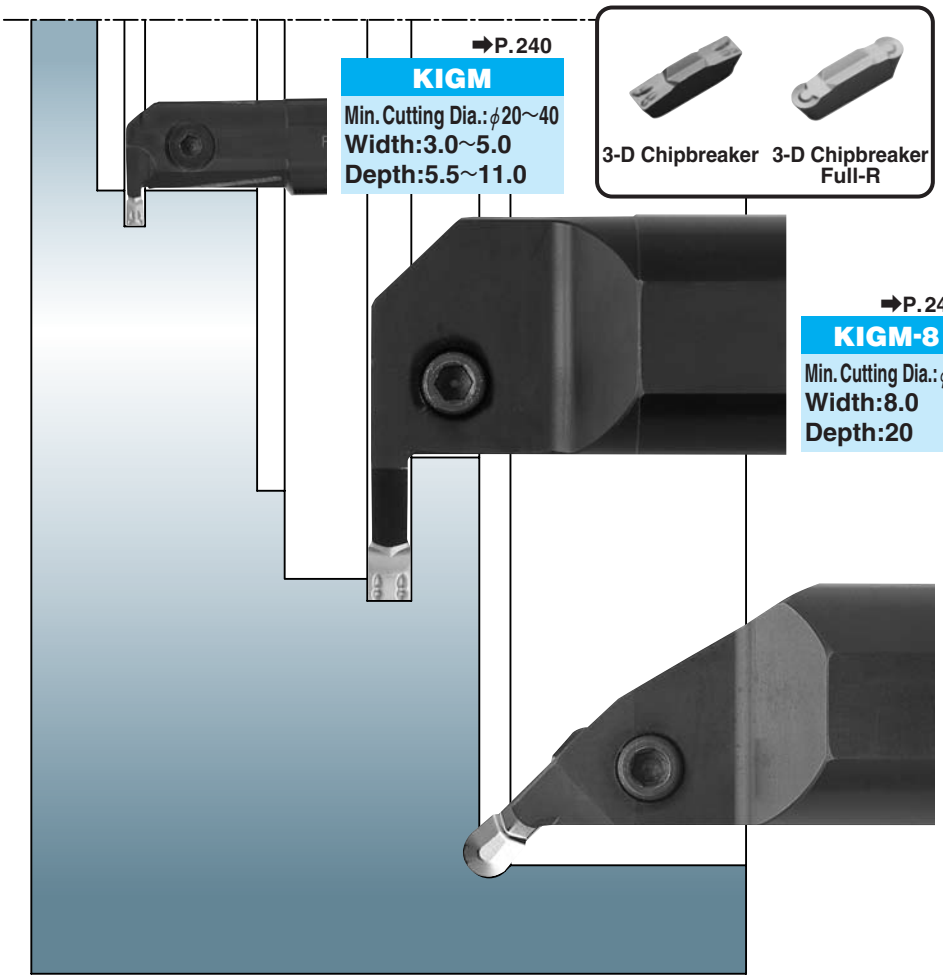
KGIA
Min. Cutting Dia.: ϕ32～66
Width: 3.0～5.0
Depth: 12～15
➡P.238

KIGH
Min. Cutting Dia.: ϕ45～65
Width: 4.0～8.0
Depth: 12
➡P.239



■ Internal Grooving & Traversing ϕ20～

Multi-Function CERACUT Plunge & Turn



➡P.240

KIGM

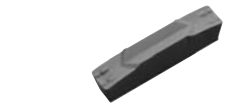
Min. Cutting Dia.: ϕ20～40
Width:3.0～5.0
Depth:5.5～11.0

3-D Chipbreaker　3-D Chipbreaker Full-R

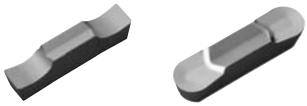
➡P.240

KIGM-8

Min. Cutting Dia.: ϕ65
Width:8.0
Depth:20



3-D Chipbreaker



Ground Chipbreaker　Ground Chipbreaker Full-R

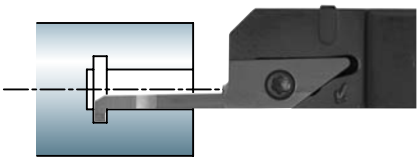
KIGMU-8

Min. Cutting Dia.: ϕ65
Width:8.0
Depth:2.2

➡P.241

■ Small Dia. Internal Grooving ϕ4～

System Tip-Bar & Tip-Bar

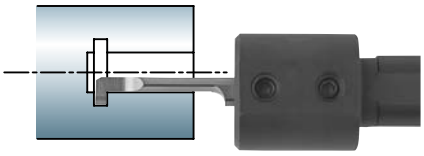


VNG

Min. Cutting Dia.: ϕ4～7
Width:1.0～2.0
Depth:0.8～2.0

➡P.230

System Tip-Bar



PSG

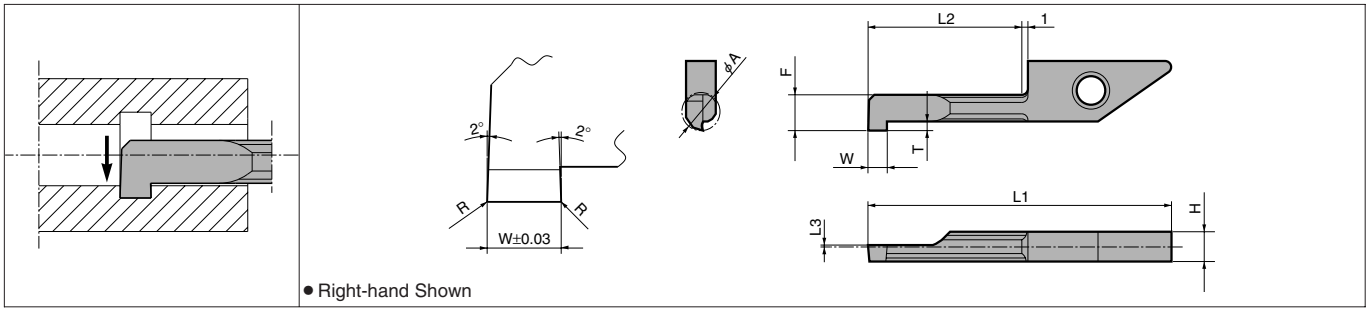
Min. Cutting Dia.: ϕ5～8
Width:1.0～2.0
Depth:1.5～2.0

➡P.231

Tip-Bar

System Tip-Bar for Micro Internal Grooving [Solid]

■ VNG



● Right-hand Shown

● Insert Dimension

Description		Min. Cutting Dia.	Dimension (mm)								Insert Grade				
											Cermet	PVD Coated		Carbide	Diamond
		φA	W	R	H	L1	L2	L3	F	T	TC60	PR630	PR930	KW10	KPD010
VNGR	0410-11	4	1.0	0.05	3.9	30.8	11	0.1	3.5	0.8			R	R	
	0420-11		2.0	0.10									R	R	
	0510-11	5	2.0	0.05	3.9	30.8	11	0.1	4.4	1.0	R	R	R	R	
	0520-11		1.0	0.10							R	R	R	R	
	0610-20	6	1.0	0.05	3.9	39.8	20	0.3	5.2	1.8	R	R	R	R	
	0620-20		2.0	0.10							R	R	R	R	
	0710-20	7	1.0	0.05	3.9	39.8	20	0.3	6.2	2.0	R	R	R	R	
	0720-20		2.0	0.10							R	R	R	R	
VNGR	0410-11NB	4	1.0	0.05	3.9	30.8	11	0.1	3.5	0.8					△
	0420-11NB		2.0	0.10											△
	0510-11NB	5	1.0	0.05	3.9	30.8	11	0.1	4.4	1.0					△
	0520-11NB		2.0	0.10											△
	0610-20NB	6	1.0	0.05	3.9	39.8	20	0.3	5.2	1.8					△
	0620-20NB		2.0	0.10											△
	0710-20NB	7	1.0	0.05	3.9	39.8	20	0.3	6.2	2.0					△
	0720-20NB		2.0	0.10											△

● Dimension T shows available Grooving Depth
● L3 Dimension means the Cutting Edge is above the Tool's Center Position.

System Tip-Bar is contained in 5-pc Pack.

● See Page.156-157 for the Applicable Toolholder.

◆ Recommended Cutting Conditions

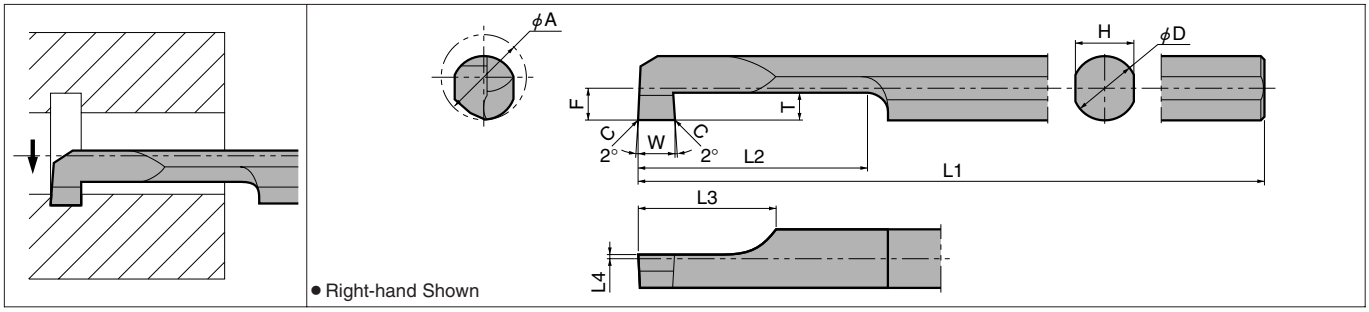
Work Material	Recommended Insert Grade (V_C m/min)				VNG04 VNG05	VNG06 VNG07	Remark
	Cermet	PVD Coated		Carbide			
	TC60	PR630	PR930	KW10	f (mm/rev)		
General Steel (S45C etc.)	☆ 60~120	☆ 30~100	★ 30~100		~0.03	~0.05	Wet Cutting
Stainless Steel (SUS304 etc.)	☆ 50~100	☆ 30~80	★ 30~80		~0.02	~0.03	
Non-ferrous Metal (Aluminium,Brass etc.)				★ ~300	~0.05	~0.08	

★ : 1st Recommendation · ☆ : 2nd Recommendation

○ : Check Availability R : R-hand Only △: Made-to-Order

Tip-Bar for Micro Internal Grooving [Solid]

■ PSG-S



● Right-hand Shown

● Tip-Bar Dimension

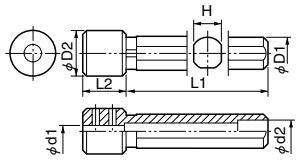
Description		Min. Cutting Dia.	Dimension (mm)										Insert Grade			
													Cermet	PVD Coated		Carbide
		φA	W±0.03	C	φD	H	L1	L2	L3	L4	F	T	TC60	PR630	PR930	KW10
PSG R/L	0510-60S	5	1.0	0.05	3.8	3.6	60	15	8	0.1	1.86	1.5				●
	0520-60S		2.0	0.1												●
PSG R/L	0610-70S	6	1.0	0.05	4.8	4.4	70	20	8	0.3	2.36	2.0	○	R	○	●
	0620-70S		2.0	0.1									○	R	○	●
PSG R/L	0710-70S	7	1.0	0.05	5.8	5.2	70	20	10	0.3	2.86	2.0	○	R	○	●
	0720-70S		2.0	0.1									○	R	R	●
PSG R/L	0810-80S	8	1.0	0.05	6.8	6.2	80	25	10	0.3	3.38	2.0	○	○	○	R
	0820-80S		2.0	0.1									○	○	○	●

● Dimension T shows available Grooving Depth

● L4 Dimension means the Cutting Edge is above the Tool's Center Position.

Tip-Bar is contained in 1-pc Pack.

● Applicable Sleeve

Shape	Description	(Old Description)	Stock	Dimension (mm)							Spare Parts		Applicable Tip-Bar
				φD1	φD2	φd1	φd2	H	L1	L2	Screw	Wrench	
	PH 0412-60	PH -0412	●	12	19	3.8	6	11	60	20	HS4X4	LW-2	PSG R/L 05○○-○○S
	0512-60	-0512	●			4.8							PSG R/L 06○○-○○S
	0612-60	-0612	●			5.8	8						PSG R/L 07○○-○○S
	0712-60	-0712	●			6.8							PSG R/L 08○○-○○S
	PH 0416-80	PH -0416	●	16	22	3.8	Rp1/4 (PS1/4)	14	80	20	HS4X4	LW-2	PSG R/L 05○○-○○S
	0516-80	-0516	●			4.8							PSG R/L 06○○-○○S
	0616-80	-0616	●			5.8							PSG R/L 07○○-○○S
	0716-80	-0716	●			6.8							PSG R/L 08○○-○○S

● Besides the above Sleeves, Collet Chucks in the market are also available.

◆ Recommended Cutting Conditions

Work Material	Recommended Insert Grade (V_C m/min)				PSG05	PSG06 PSG07 PSG08	Remark
	Cermet	PVD Coated		Carbide			
	TC60	PR630	PR930	KW10	f (mm/rev)		
General Steel (S45C etc.)	☆ 60~120	☆ 30~100	★ 30~100		~0.03	~0.05	Wet Cutting
Stainless Steel (SUS304 etc.)	☆ 50~120	☆ 30~80	★ 30~80		~0.02	~0.03	
Non-ferrous Metal (Aluminium,Brass etc.)				★ ~300	~0.05	~0.08	

★ : 1st Recommendation · ☆ : 2nd Recommendation

Remarks on PSG-S type Tool

How to install Tip-Bar

PSG-S should be installed accurately because errors from the cutting edge's height and angle affect the machining precision in the micro grooving application. When installing, set the cutting edge above the center position as shown in the Chart 1. All PSG-S type tools are produced to have the cutting edge above the center position. (See L4 dimension.)

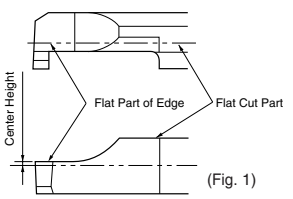
①In case of using the exclusive sleeve (PH○○12-60, PH○○16-80), the cutting edge of PSG-S tool comes to the suitable position automatically.

②In case of using the collet chuck in the market, adjust the center height according to the Chart 1.

It is easy to adjust the center height, using the edge's flat part. (Fig. 1)

(Chart 1)

Tip-Bar	Center Height (mm)
PSG05 type	0.1
PSG06 type	0.3
PSG07 type	0.3
PSG08 type	0.3

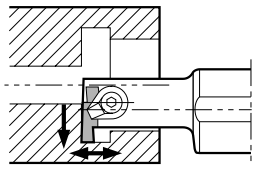


(Fig. 1)

● : Std. Stock ○ : Check Availability R : R-hand Only

Internal Small Dia. Grooving Toolholders [GV Insert]

■ GIV



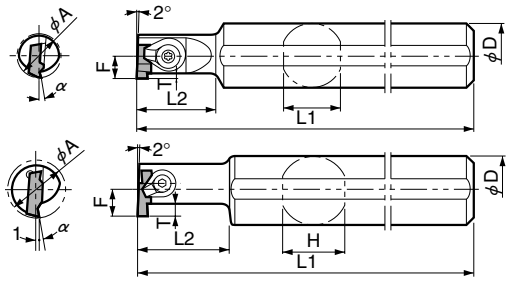


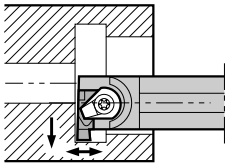
Fig. 1

Fig. 2

● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ GIV-E Excellent Bar



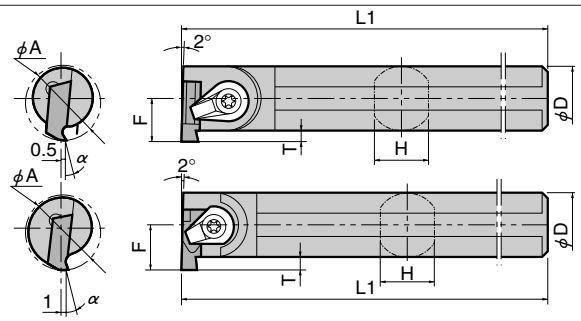


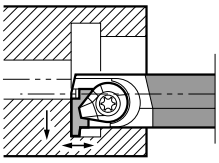
Fig. 1

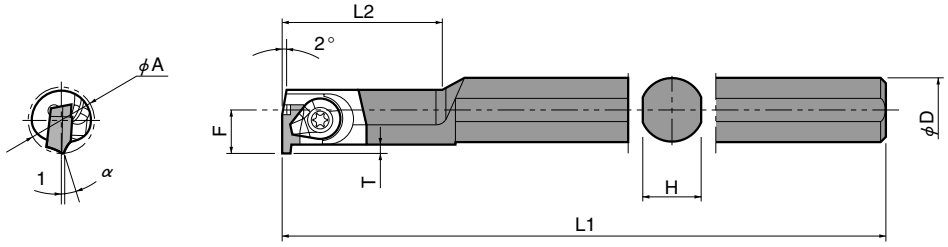
Fig. 2

● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ GIV-W Carbide Shank Bar





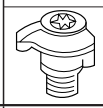
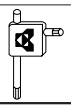
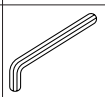
● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Applicable Insert & Rake Angle(α) after Installment of Insert

Toolholder	Insert		Rake Angle (α)	
	General Grooving (Square)	Full-R Grooving (Round)	**TC40**	**TN90,TC60 PR630,PR930 KW10**
GIV R/L…1SS	GV R/L 100SS~300SS	-	10°	15°
GIV R/L…1S	GV R/L 100S~340S	-	10°	15°
GIV R/L…1SE	GV R/L 100S~340S	-	3°	8°
GIV R/L…1A(□)	GV R/L 100A~340A	GV R/L 100AR~150AR	3°	8°
GIV R/L…1B(□)	GV R/L 145B~250B	GV R/L 100BR	4°	9°
GIV R/L…2B(□)	GV R/L 280B~400B	GV R/L 150BR		
GIV R/L…1C(□)	GV R/L 280C~340C	-	5°	10°
GIV R/L…2C(□)	GV R/L 400C~500C	-		

● Toolholder Dimension

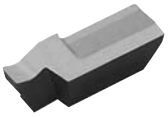
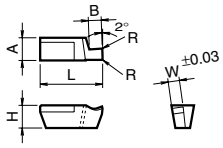
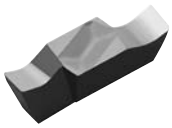
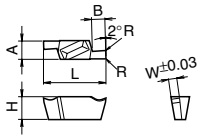
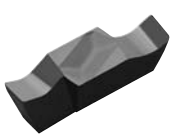
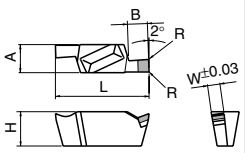
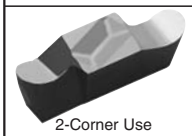
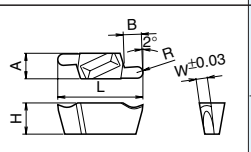
Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L1	L2	F	T	Shape	Spare Parts: Clamp Set		Wrench	Wrench
															
GIV型	1216-1SS	●	●	12	16	15	150	20	6.0	2.2	Fig.1	CPS-4V	-	FT-10	-
	1420-1S	●	○	14	20	19	150	24	7.0	2.2	Fig.1	CPS-5F	-	FT-15	-
	1620-1A	●	●	16	20	19	160	28	8.0	2.2	Fig.2	CPS-5V	-	FT-15	-
	2025-1B	●	●	20	25	23	180	35	10.0	1) 2.8	Fig.2	CPS-5V	-	FT-15	-
	2025-2B	●	●	20	25	23	180	35	10.0	2) 3.2					
	2532-1C	●	●	25	32	30	200	43	12.5	3) 4.5	Fig.2	-	CPS-6V	-	LW-3
	3232-1C	●	●	32	32	30	220	52	16.0	3) 4.5					
	4032-1C	○	○	40	32	30	250	-	21.0	3) 4.5					
	2532-2C	●	●	25	32	30	200	43	12.5	4) 5.5					
	3232-2C	●	●	32	32	30	220	52	16.0	4) 5.5					
	4032-2C	○	○	40	32	30	250	-	22.2	4) 5.5					
GIV型	1412-1SE	○	●	14	12	11.4	150	-	7.7	1.7	Fig.1	CPS-5F	-	FT-15	-
	1612-1AE	●	○	16	12	11.4	150	-	8.2	2.2	Fig.2	CPS-5V	-	FT-15	-
	2016-1BE	○	○	20	16	15.2	180	-	11.2	1) 2.8	Fig.2	CPS-5V	-	FT-15	-
	2016-2BE	○	○	20	16	15.2	180	-	11.7	5) 3.2					
	2520-1CE	○	○	25	20	19	200	-	14.5	6) 4.5	Fig.2	-	CPS-6V	-	LW-3
	3225-1CE	○	○	32	25	24	220	-	17.5	7) 4.5					
	4032-1CE	○	○	40	32	31	240	-	21.0	7) 4.5					
	2720-2CE	○	○	27	20	19	200	-	16.2	4) 5.5					
	3225-2CE	○	○	32	25	24	220	-	18.7	4) 5.5					
	4032-2CE	○	○	40	32	31	240	-	22.2	4) 5.5					
GIV型	1616-1AW	●	○	16	16	15	175	48	10.6	2.2	-	CPS-5V	-	FT-15	-
	2020-1BW	●	○	20	20	19	220	60	14.6	1) 2.8	-	CPS-5V	-	FT-15	-
	2020-2BW	○	○	20	20	19	220	60	14.6	2) 3.2					
	2525-1CW	●	○	25	25	24	260	75	19.1	3) 4.5	-	-	CPS-6V	-	LW-3
	2525-2CW	●	○	25	25	24	260	75	19.1	4) 5.5					

● Dimension T shows available Grooving Depth

1): GV型 200B～250B Insert is available till Groove Depth 3.2mm.
2): GV型 300B～400B Insert is available till Groove Depth 4.2mm.
3): GV型 340C insert is available till Groove Depth 5.5mm
4): GV型 430C～500C Insert is available till Groove Depth 6.3mm
5): GV型 300B～400B Insert is available till Groove Depth 3.8mm (when using GIV型 2016-2BE)
6): GV型 340C Insert is available till Groove Depth 4.7mm (when using GIV型 2520-1CE)
7): GV型 340C Insert is available till Groove Depth 5.3mm (when using GIV型 3225-1CE, GIV型 4032-1CE)

Internal Small Dia. Grooving Toolholders [GV Insert]

● Applicable Insert

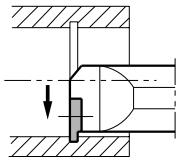
Shape (Right-hand Shown)		Description		Dimension (mm)						Insert Grade								
										Cermet				CVD Coated	PVD Coated		Carbide	Diamond
				W	B	R	A	L	H	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10	KPD010
 1-Corner Use		GV R/L	100SS	1.00	2.3	0.2	3.6	9	3.0		R		R		○	●	○	
			125SS	1.25							R		R		○	●	○	
			145SS	1.45							R		○		○	●	○	
			200SS	2.00							R		○		○	●	○	
			250SS	2.50							R		○		○	●	○	
			300SS	3.00							R		○		○	●	○	
		GV R/L	100S	1.00	2.3	0.2	4.0	11	4.0		R	○	○		○	R	○	
			125S	1.25							R	○	○		○	R	○	
			145S	1.45							R	○	○		○	R	○	
			185S	1.85							R	○	○		○	R	○	
			200S	2.00							R	○	○		○	R	○	
			250S	2.50							R	○	○		○	R	○	
			340S	3.40								○	○		○	R	○	
 2-Corner Use		GV R/L	100A	1.00	2.3	0.2	4.0	12	5.0		R	○	●		○	○	○	
			120A	1.20									●					
			125A	1.25							R	○	R		○	R	L	
			140A	1.40									●					
			145A	1.45							R	○	R		○	R	○	
			170A	1.70									●					
			185A	1.85							R	○	R		○	R	○	
			195A	1.95									●					
			200A	2.00							●	○	●		○	R	○	
			225A	2.25									●					
			250A	2.50							R	○	R		○	R	○	
			275A	2.75									●					
			300A	3.00							R	○	R		○	R	○	
			340A	3.40							R	○	R		○	R	○	
		GV R/L	145B	1.45	2.8	0.2	4.5	15	5.5		R	○	○		○	○	○	
			185B	1.85							R	○	○		○	R	○	
			200B	2.00	3.2						●	○	●		○	●	○	
			225B	2.25									●					
			230B	2.30							●	○	○		R	R	R	
			250B	2.50							R	○	●		○	●	●	
			275B	2.75									●					
			280B	2.80							R	○	○		R	R	R	
			300B	3.00	4.2						●	○	●		○	●	●	
			325B	3.25									●					
			340B	3.40							R	○	○		R	R	R	
			400B	4.00							R	○	●		L	R	●	
		GV R/L	280C	2.80	4.5	0.2	5.8	21	6.5		●	○	L		○	R	○	
			300C	3.00							●	○	○		○	○	○	
			325C	3.25	5.5								●					
			340C	3.40							R	○	○		○	○	○	
			400C	4.00							●	○	●		○	○	○	
			425C	4.25	6.3								●					
			430C	4.30							R	○	○		○	R	○	
			460C	4.60								○	○		○	R	○	
			500C	5.00							R	○	○		○	R	○	
 1-Corner Use		GV R/L	145A	1.45	2.3	0.2	4.0	12	5.0									△
			200A	2.00														△
			300A	3.00														△
		GV R/L	200B	2.00	3.2	0.2	4.5	15	5.5									△
			250B	2.50														△
			300B	3.00	4.2													△
		GV R/L	300C	3.00	4.5	0.2	5.8	21	6.5									△
			400C	4.00	5.5													△
 2-Corner Use Full-R		GV R/L	100AR	2.00	2.3	1.00	4.0	12	5.0				R		R	○	R	
			125AR	2.50		1.25							R		R	R	R	
			150AR	3.00		1.50							R		R	R	R	
		GV R/L	100BR	2.00	3.2	1.00	4.5	15	5.5		R		R		R	R	R	
			150BR	3.00	4.2	1.50					R		R		R	R	R	

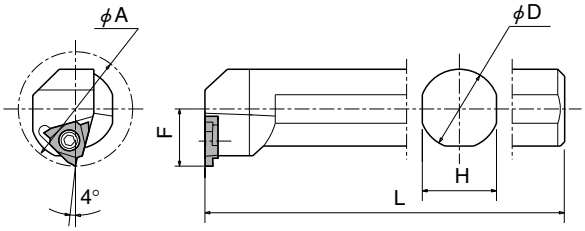
Recommended Cutting Conditions ⏩ P.262

● : Std. Stock ○ : Check Availability R : R-hand Only △: Made-to-Order

Internal Large Dia. Shallow Grooving Toolholders [TG Insert]

■ KITG





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

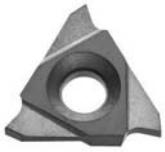
● Toolholder Dimension

Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L	F	Spare Parts: Clamp Screw		Wrench	
KITG R/L	3525T-16	○	○	35	25	23	220	17.5	SB-4TR	-	FT-15	-
	4532T-22	●	○	45	32	30	250	22.5	-	GS-50	-	LW-3

● Available Grooving Depth: KITG R/L 3525T-16 = 2.0mm, KITG R/L 4532T-22 = 2.5mm

● Applicable Insert

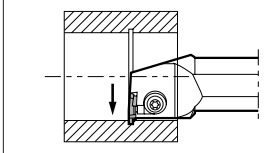
Toolholder	Insert
KITG R/L…16	TG32 L/R ○○○
KITG R/L…22	TG43 L/R ○○○

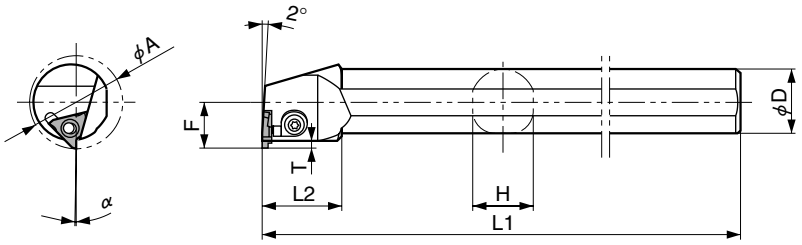
Shape (Right-hand Shown)	Description		Dimension (mm) W	B	R or C	A	T	φd	Insert Grade: Cermet TN60	TN90	TC40	TC60	PVD Coated PR630	PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
	TG32 R/L	075	0.75	2.0	C0.1	9.525	3.18	4.5	○								
		095	0.95						○								
		125	1.25						○								
		145	1.45						○								
		150	1.50						○								
		175	1.75						○								
		200	2.00						○								
	TG43 R/L	150	1.50	3.5	R0.2	12.70	4.76	5.5	○								
		175	1.75						○								
		200	2.00						○								
		230	2.30						○								
		250	2.50	4.0	R0.3				○								
		265	2.65						○								
		280	2.80						○								
		300	3.00						○								
		330	3.30						○								
		350	3.50	5.0	R0.4				○								
		400	4.00						○								
		430	4.30						○								
		450	4.50						○								

Recommended Cutting Conditions P.253

Internal Large Dia. Shallow Grooving Toolholders [GBA Insert]

■ KIGBA





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L1	L2	F	T	Spare Parts: Clamp Set	Spare Parts: Wrench
KIGBA R/L	3525-16	●	●	35	25	23	220	30	17.5	3.0	LGBA-16 L/R S	FT-15
	4032-22	●	●	40	32	30	250	30	23.0	3.0	LGBA-22 L/R S	FT-15

● T Dimension shows the Distance from the Cutting Edge to the Toolholder.
Available Grooving Depth : KIGBA R/L 3525-16 ··· "B" Dimension of the Applicable Insert
KIGBA R/L 4032-22 ··· 2.0mm for GBA43 R/L 125, 140, 145, 050R
2.8mm for the Inserts except the above

● Clamp Set : LGBA-□LS for Right-hand Toolholder, LGBA-□RS for Left-hand Toolholder

● Applicable Insert

Toolholder	Insert		
KIGBA R/L···16	GBA32 L/R ○○○	-	-
KIGBA R/L···22	GBA43 L/R ○○○	GBA43 L/R 200MY~400MY	GBA43 L/R ○○○R

● Rake Angle(α) after Installment of GBA type

GBA32 R/L ○○○		GBA43 R/L ○○○		GBA43 R/L ○○○R (Full-R)	
α	Insert Grade	α	Insert Grade	α	Insert Grade
+1°	TN90 PR630 PR930 KPD010	-9°	KBN10B	+1°	TN90 PR630 PR930 } 050R~150R
+11°	KW10	+1°	TN90 PR630 PR930 KPD010 KPD001	+5°	TN90 PR630 PR930 } 200R
		+11°	KW10		KW10···050R~200R

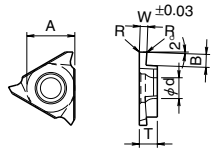
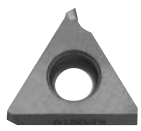
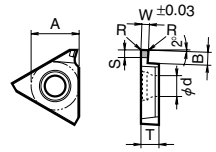
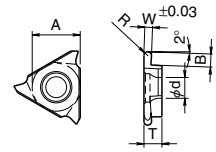
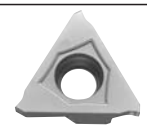
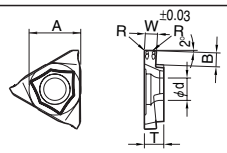
● Rake Angle(α) after Installment of GBA-MY type

α	Insert
+6°	GBA43 R/L 200MY
+6°	GBA43 R/L 250MY
+6°	GBA43 R/L 300MY
+6°	GBA43 R/L 350MY
+5°	GBA43 R/L 400MY

α means the Rake Angle at the Center of the Edge Width, after Installing Insert

● : Std. Stock ○ : Check Availability

● Applicable Insert

Shape (Right-hand Shown)	Description		W	B	R	A	T	φd	Insert Grade: Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010	Diamond KPD001
 	GBA32R/L	050 ※	0.50	1.0	R0.05	9.525	3.18	4.4		R			○	●	○			
		075	0.75	2.0						R			○	●	○			
		095	0.95							R			○	●	○			
		100	1.00							●			○	●	○			
		110	1.10		R0.2									●				
		120	1.20											●				
		125	1.25										○	●	○			
		130	1.30											●				
		140	1.40											●				
		145	1.45										○	●	○			
		150	1.50							●			○	●	○			
		160	1.60											●				
		170	1.70											●				
		175	1.75										○	●	○			
		200	2.00							●			○	●	○			
		225	2.25	2.5										●				
		250	2.50							R			○	●	○			
		300	3.00							●				●				
	GBA43R/L	125	1.25	2.0	R0.2	12.70	4.76	5.5		●			○	●	○			
		140	1.40											●				
		145	1.45							R			○	●	○			
		150	1.50	3.5						●			○	●	○			
		170	1.70							●				●				
		175	1.75							●			○	●	○			
		185	1.85							R			○	●	○			
		195	1.95											●				
		200	2.00							●			○	●	○			
		225	2.25											●				
		230	2.30							●			○	●	○			
		250	2.50	4.0	R0.3					●			○	●	○			
		265	2.65							R			○	●	○			
		280	2.80							●			○	●	○			
		300	3.00							●			○	●	○			
		325	3.25							●				●				
		330	3.30							R			○	●	○			
		350	3.50	5.0						●			○	●	○			
		400	4.00		R0.4					●			○	●	○			
		430	4.30							R			○	●	○			
		450	4.50							R			○	●	○			
		480	4.80				5.00			R			○	●	○			
  GBA32 S=1.7 GBA43 S=1.9 1-Corner Use	GBA32R/L	125	1.25	2.0	R0.1	9.525	3.18	4.4									L	
		150	1.50														R	
	GBA43R/L	125	1.25	2.0	R0.1	12.70	4.76	5.5									○	
		125	1.25		R0.2											R		
		150	1.50	3.5	R0.1												○	○
		150	1.50		R0.2											●		
		200	2.00		R0.1												○	○
		200	2.00		R0.2											R		
		250	2.50	4.0	R0.1												○	○
		250	2.50		R0.2											R		
		300	3.00		R0.1												R	○
		300	3.00		R0.2											R		
  Full-R	GBA32R/L	100R	2.00	2.5	R1.00	9.525	3.18	4.4						R				
		150R	3.00		R1.50									R				
	GBA43R/L	050R	1.00	2.0	R0.50	12.70	4.76	5.5		●			○	●	○			
		075R	1.50	3.5	R0.75					●			○	●	○			
		100R	2.00		R1.00					●			○	●	○			
		125R	2.50	4.0	R1.25					●			○	●	○			
		150R	3.00		R1.50					●			○	●	○			
		200R	4.00	5.0	R2.00					●			○	●	○			
  With MY Chipbreaker	GBA43R/L	200MY	2.00	3.5	R0.2	12.70	4.76	5.5						●				
		250MY	2.50	4.0	R0.3									●				
		300MY	3.00		R0.3									●				
		350MY NEW	3.50	5.0	R0.3									●				
		400MY	4.00		R0.4									●				

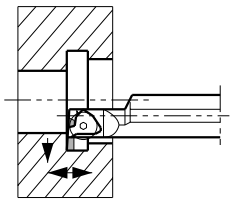
● The Edge Width Tolerance of GBA32R/L050 is different: $0.50^{+0.05}_{-0}$ (※)

● : Std. Stock ○ : Check Availability R : R-hand Only

Recommended Cutting Conditions ➡ P.260

Internal Large Dia. Deep Grooving Toolholders [GIA Insert]

■ KGIA



Integral type

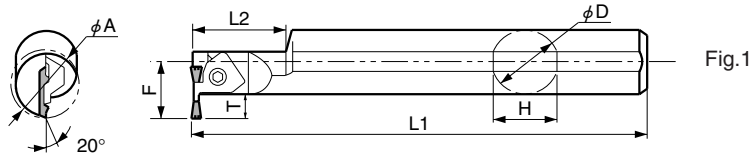
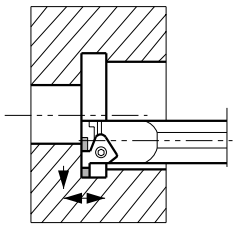


Fig.1



Separate type

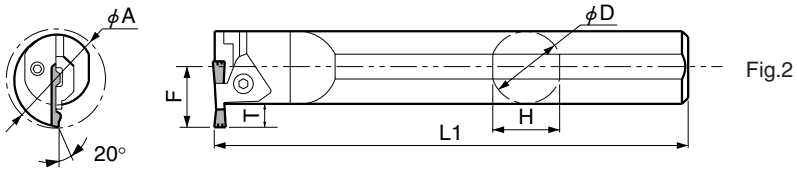


Fig.2

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L1	L2	F	T	Shape	Spare Parts: Clamp	Clamp Bolt	Spring	Wrench
KGIA R/L	3232B-3	○		32	32	30	200	45	26.3	10	Fig.1	CGIA-3R	HH5X15	SP-5	LW-4
	4332B-3	○		43	32	30	200	-	26.3	10	Fig.2				
	5140B-3	○		51	40	38	250	-	30.3	10					
	3232B-4	●		32	32	30	200	45	26.3	10	Fig.1	CGIA-4R	HH5X15	SP-5	LW-4
	4332B-4	○		43	32	30	200	-	26.3	10	Fig.2				
	5140B-4	○		51	40	38	250	-	30.3	10					
	5640B-5	●		56	40	38	250	-	35.3	15	Fig.2	CGIA-5R	HH5X15	SP-5	LW-4
	6650B-5	○		66	50	48	300	-	40.3	15					

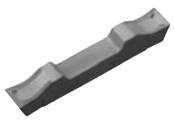
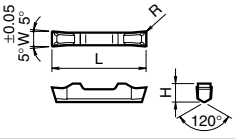
● Dimension T shows available Grooving Depth

● Composition

Type	Toolholder	Spare Parts: Base Body	Blade	Screw	Wrench
Integral type	KGIA R/L 3232B-3	-	-	-	-
Separate type	4332B-3	KGIAR32H	BGIAR43-3	SB-40140TR	FT-15
	5140B-3	KGIAR40H	BGIAR51-3		
Integral type	3232B-4	-	-	-	-
Separate type	4332B-4	KGIAR32H	BGIAR43-4	SB-40140TR	FT-15
	5140B-4	KGIAR40H	BGIAR51-4		
Separate type	5640B-5	KGIAR40H	BGIAR56-5	SB-40140TR	FT-15
	6650B-5	KGIAR50H	BGIAR66-5		

● Applicable Insert

Toolholder	Insert
KGIA R/L···3	GIA30
KGIA R/L···4	GIA40
KGIA R/L···5	GIA50

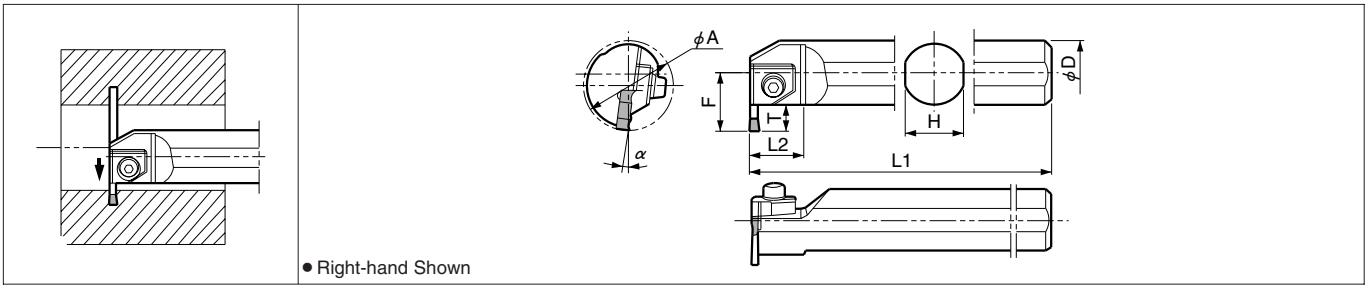
Shape	Description		Dimension (mm) W	B	R	A	L	H	Insert Grade: Cermet TN60	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Ceramic SN60	Ceramic A65	Ceramic A66N
 3-D Chipbreaker	GIA	30	3.0		0.20		25		○			○						
		40	4.0	-	0.25	-	25	5.0	●			●						
		50	5.0		0.30		30		○			●						

Recommended Cutting Conditions ➡ P.262

● : Std. Stock ○ : Check Availability

Internal Large Dia. Deep Grooving Toolholders [GH/GHU Insert]

■ KIGH



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L1	L2	F	T	Spare Parts: Clamp	Clamp Bolt	Washer	Spring	Wrench
KIGH R/L	4532B-4	●		45	32	30	200	27	28.2	12	CGH-1L	HH6X25	W-6	SP-6	LW-5
	5540B-4	●		55	40	38	250	27	32.2	12					
	6550B-4	●		65	50	48	300	27	37.2	12					
	4532B-5	○		45	32	30	200	27	28.2	12	CGH-1L	HH6X25	W-6	SP-6	LW-5
	5540B-5	○		55	40	38	250	27	32.2	12					
	6550B-5	○		65	50	48	300	27	37.2	12					
	5540B-7	○		55	40	38	250	27	32.2	12	CGH-2L	HH6X25	W-6	SP-6	LW-5
	6550B-7	●		65	50	48	300	27	37.2	12					

● Dimension T shows available Grooving Depth

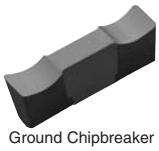
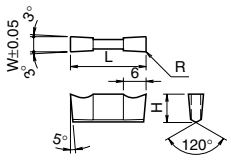
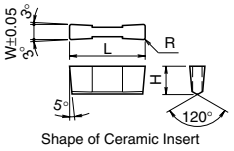
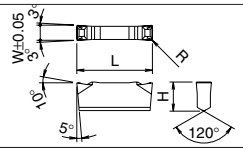
● L2 Dimension depends on the Width of the Installed Insert.

● Applicable Insert

Toolholder	Insert	
KIGH R/L···4	GH40/45	GHU40
KIGH R/L···5	GH50/55/60/65	GHU50/60
KIGH R/L···7	GH70/75/80	-

● Rake Angle(α) after Installment of GH / GHU type

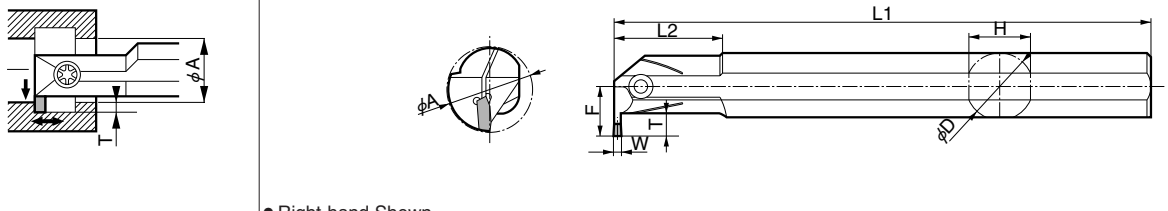
GH○○○○-○○ α	GH○○○○-○○ Insert Grade	GHU○○○○ α	GHU○○○○ Insert Grade
-5°	A65, A66N	+5°	TN60, CR9025
+5°	TC40		
+15°	TN90, TC60, PR630, PR930, KW10		

Shape		Description		Dimension (mm) W	B	R	A	L	H	Insert Grade: Cermet TN60	TN90	TC40	TC60	CVD Coated CR9025	PVD Coated PR630	PR930	Carbide KW10	Ceramic A65	A66N
 Ground Chipbreaker		GH	4020-02	4.0	-	0.2	-	20	7.5		○	○	●		○	●	●		●
			4020-05			0.5					○	○	○		○	○	○	○	
			4520-02	4.5	-	0.2	-	20	7.5			○							
			4520-05			0.5						○							
			5020-02	5.0	-	0.2	-	20	7.5		○	○	○		○	●	○		
			5020-05			0.5					○	○	○		○	○	○	○	●
			5520-02	5.5	-	0.2	-	20	7.5			○							
			5520-05			0.5						○							
			6020-02	6.0	-	0.2	-	20	7.5		○	○	○		○	●	○		
			6020-05			0.5					○	○	○		○	○	○	○	●
			6520-02	6.5	-	0.2	-	20	7.5			○							
			6520-05			0.5						○							
 Ceramic	 Shape of Ceramic Insert (Cutting Edge is chamfered : 0.1mm X 20°)		7020-02	7.0	-	0.2	-	20	7.5		○	○	●		○	○	○		
			7020-05			0.5					○	○	●		○	●	○	○	●
			7520-02	7.5	-	0.2	-	20	7.5			○							
			7520-05			0.5						○							
			8020-02	8.0	-	0.2	-	20	7.5		○	○	●		○	●	●		
			8020-05			0.5					○	○	●		○	●	○		●
 3-D Chipbreaker		GHU	4020	4.0	-	0.25	-	20	7.5	●				○					
			5020	5.0	-	0.30	-	20	7.5	●				○					
			6020	6.0	-	0.30	-	20	7.5	●				○					

Recommended Cutting Conditions ➡ P.261

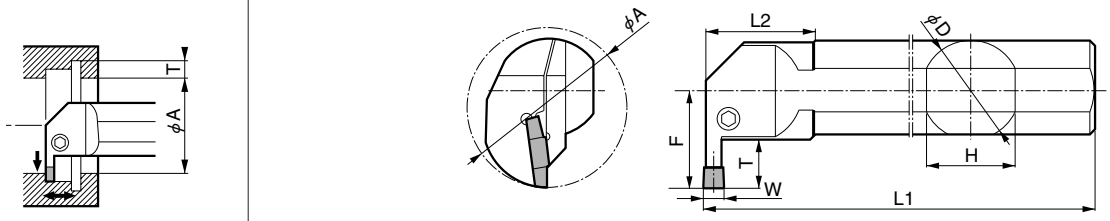
Internal Grooving Toolholders — CERACUT Plunge & Turn

■ KIGM



● Right-hand Shown

■ KIGM-8 (Using 8mm-Width Insert, Large Internal Dia. Deep Grooving)



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	H	L1	L2	F	T				Width W(mm) MIN.	MAX.	Spare Parts: Screw GS	Screw SB	Wrench	
KIGMR/L	2016B-3	●	●	20	16	15	150	25	12	5.5				3.0	3.0	GS-50	-	-	LW-3
	2520B-3	●	●	25	20	18	180	32	14.2	5.5									
	3225B-3	●	●	32	25	23	200	40	18.8	8.0						SB-5TR	-	LTW-20	-
	3225B-4	●	●	32	25	23	200	40	19.5	8.5				4.0	5.0	SB-5TR	-	LTW-20	-
	4032B-4	●	●	40	32	29	220	50	25.5	11.0						-	HH6X20	-	LW-5
KIGMR/L	6540B-8	●	●	65	40	36	300	41	41	20				8.0	8.0	-	HH6X20	-	LW-5

● Dimension T shows available Grooving Depth

● Applicable Insert

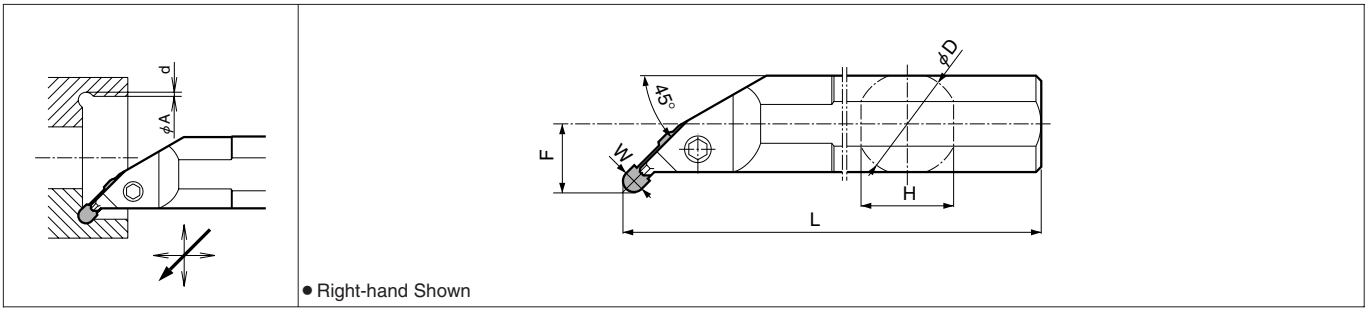
Application	Grooving/Traversing	Grooving	Full-R/Copying	Full-R/Copying
Ref. Page	241	241	241	241
Shape / Toolholder				
KIGMR/L···3	GMM3014-04	-	GMM3014-15R	-
KIGMR/L···4	GMM4017-04 GMM5017-08	-	GMM4017-20R GMM5017-25R	-
KIGMR/L···8	GMM8030-08	GMG 8030-05MG	-	GMGA 8030-40R

Recommended Cutting Conditions ➔ P.263

● : Std. Stock ○ : Check Availability

Internal Undercutting Toolholders CERACUT Plunge & Turn

■ KIGMU-8



● Right-hand Shown

● Toolholder Dimension

Description	Stock R	Stock L	Min. Cutting Dia. φA	Dimension (mm) φD	L	H	F	d	Width W(mm) MIN.	MAX.	Spare Parts Screw	Wrench
KIGMU R/L 6540B-8	○		65	40	350	36	26	2.2	8.0	8.0	HH6X20	LW-5

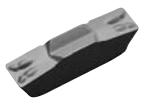
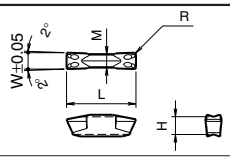
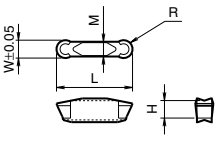
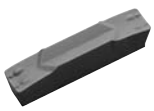
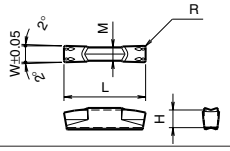
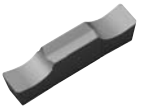
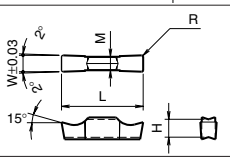
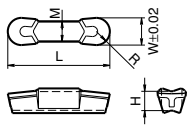
● d Dimension shows the Distance from Internal Dia. of the Workpiece.

● Applicable Insert

Application	Undercutting	Undercutting	Undercutting
Ref. Page	241	241	241
Shape / Toolholder			
KIGMU R/L···8	GMM8030-08	GMG 8030-05MG	GMGA 8030-40R

Recommended Cutting Conditions ➡ P.264

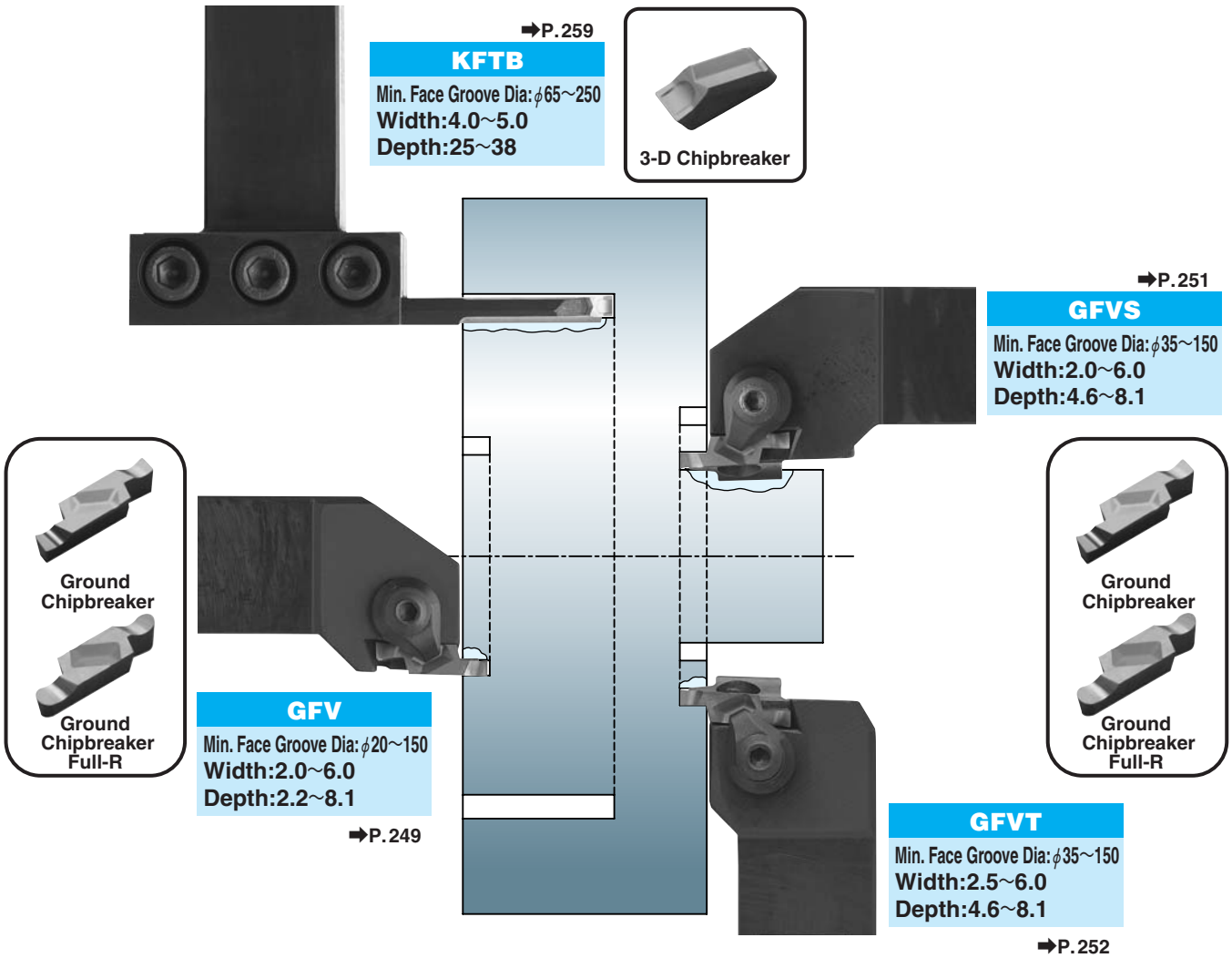
● Inserts for Internal Grooving and Undercutting

Shape		Description		Dimension (mm) W	R	L	H	M	Angle (°) θ	Insert Grade Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
 Chip Control Oriented		GMM	3014-04	3.0	0.4	14		2.3		●	●	●	●	●		
			4017-04	4.0	0.4	17	4.3	3.3	-	●	●	●	●	●		
			5017-08	5.0	0.8	17		4.2		●	●	●	●	●		
 Chip Control Oriented Full-R/Copying		GMM	3014-15R	3.0	1.5	14		2.3		●	○		●	○		
			4017-20R	4.0	2.0	17	4.3	3.3	-	●	●		○	○		
			5017-25R	5.0	2.5	17		4.2		●	○		○	○		
 Chip Control Oriented		GMM	8030-08	8.0	8.0	30	5.5	6.0	-		●	●	●	●		
 Sharp-Cutting Oriented Ground Chipbreaker		GMG	8030-05MG	8.0	0.5	30	5.5	6.0	-	○	○		○	●		
 Sharp-Cutting Oriented Full-R/Copying		GMGA	8030-40R	8.0	4.0	30	5.5	6.0	-					●		

● : Std. Stock ○ : Check Availability

Summary of Face Grooving

■ Face Grooving ϕ20～



➡P.259

KFTB
Min. Face Groove Dia: ϕ65～250
Width:4.0～5.0
Depth:25～38

3-D Chipbreaker

➡P.251

GFVS
Min. Face Groove Dia: ϕ35～150
Width:2.0～6.0
Depth:4.6～8.1

Ground Chipbreaker
Ground Chipbreaker Full-R

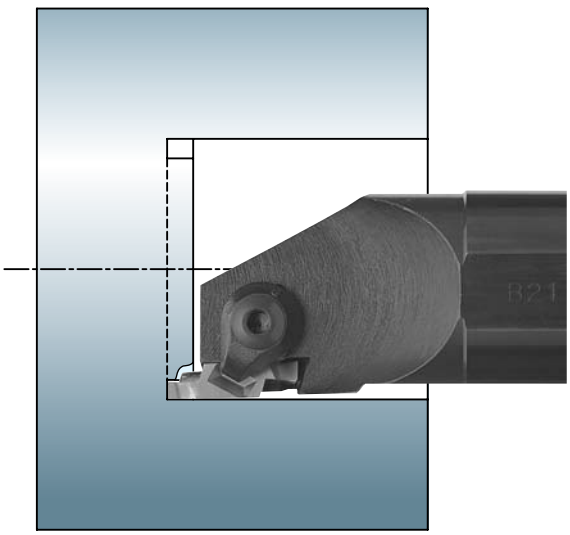
GFV
Min. Face Groove Dia: ϕ20～150
Width:2.0～6.0
Depth:2.2～8.1

➡P.249

Ground Chipbreaker
Ground Chipbreaker Full-R

GFVT
Min. Face Groove Dia: ϕ35～150
Width:2.5～6.0
Depth:4.6～8.1

➡P.252



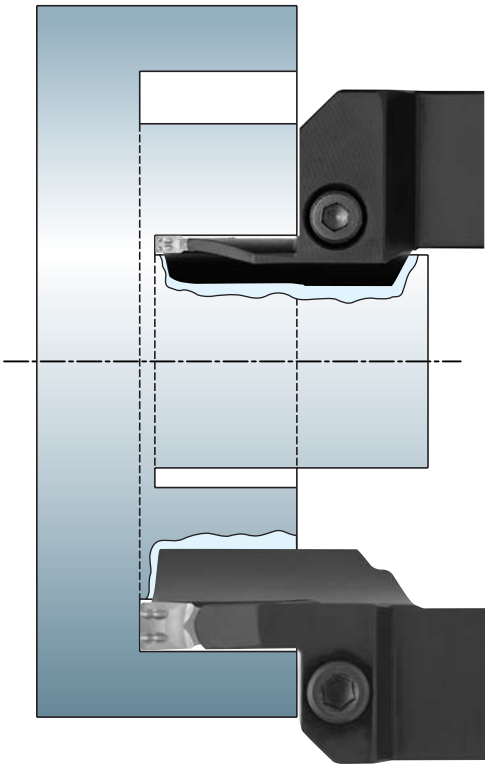
➡P.255

GIFV
Min. Face Groove Dia: ϕ35～50
Width:2.0～6.0
Depth:2.2～8.1

Ground Chipbreaker
Ground Chipbreaker Full-R

■ Face Grooving & Traversing ϕ25～

Multi-Function CERACUT Plunge & Turn

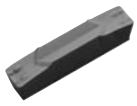


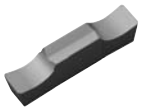
KFMS
Min. Face Groove Dia: ϕ25～235
Width:2.0～6.0
Depth:13～32
➡P.256


3-D Chipbreaker

➡P.258

KFMS-8
Min. Face Groove Dia: ϕ54～155
Width:8
Depth:25

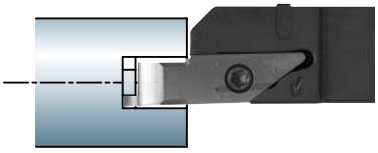

3-D Chipbreaker


Ground Chipbreaker


Ground Chipbreaker Full-R

■ Small Dia. Face Grooving ϕ8～

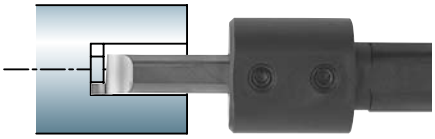
System Tip-Bar &Tip-Bar
Small Shank



➡P.245

VNFG
Min. Face Groove Dia: ϕ8
Width:1.0～3.0
Depth:2.0～3.0

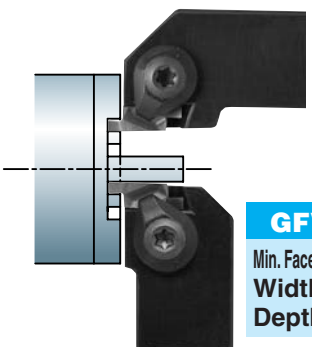

System Tip-Bar



➡P.246

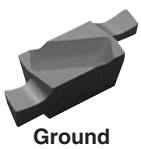
PSFG
Min. Face Groove Dia: ϕ8
Width:1.0～3.0
Depth:2.0


Tip-Bar



GFVS-AA
Min. Face Groove Dia: ϕ8
Width:1.0～3.0
Depth:2.2
➡P.247

GFVT-AA
Min. Face Groove Dia: ϕ8
Width:1.0～3.0
Depth:2.2
➡P.248


Ground Chipbreaker

Face Grooving Diameter Table

● Specification Table of Shallow Grooving Insert (Depth≦8.1mm)

Type		Width (mm)	Depth (mm)	Face Grooving Dia. ϕD (mm) 0 8 20 30 50 70 100 150 250 →∞	Ref. Page
VNFG (System Tip-Bar)		1.0~3.0	2.0~3.0	8~∞ (Traversing is not available.)	245
PSFG-S (Tip-Bar)		1.0~3.0	2.0	8~∞ (Traversing is not available.)	246
GFVS-AA,GFVT-AA		1.0~3.0	2.2	8~∞ (Traversing is not available at edge width 1.0mm)	247~8
GFV	201A	2.0~3.4	2.2	20~∞	249
KGMM KGMS		3.0	3.0~3.5	22~∞	225~6
		4.0	4.0	28~∞	
		5.0	4.0	30~∞	
GIFV	201A	2.0~3.4	2.2	35~∞	255
GFV,GFVS,GFVT	351B	2.5~3.5	4.6	35~50	251~5
GIFV	352B	4.0~4.9	5.1	35~50	
GFV,GFVS,GFVT GIFV	501B	2.5~3.5	4.6	50~70	251~5
	502B	4.0~4.9	5.1	50~70	
	501C	3.5~4.5	6.6	50~70	
	502C	5.0~6.0	8.1	50~70	
GFV,GFVS,GFVT	701B	2.5~3.5	4.6	70~100	251~5
	702B	4.0~4.9	5.1	70~100	
	701C	3.5~4.5	6.6	70~100	
	702C	5.0~6.0	8.1	70~100	
GFV,GFVS,GFVT	1001C	3.5~4.5	6.6	100~150	251~5
	1002C	5.0~6.0	8.1	100~150	
GFV,GFVS,GFVT	1501C	3.5~4.5	6.6	150~250	251~5
	1502C	5.0~6.0	8.1	150~250	

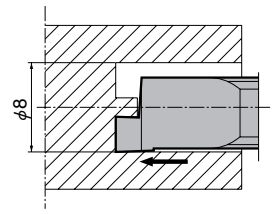
● Specification Table of Deep Grooving Insert (Depth>8.1mm)

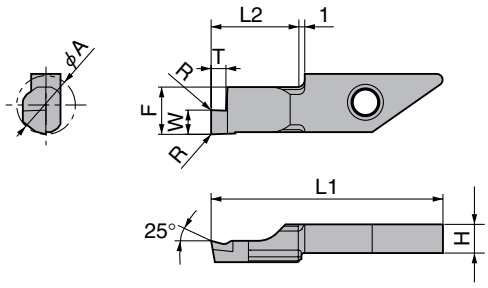
Toolholder Type	Width (mm)	Depth (mm)	Face Grooving Dia. ϕD (mm) 25 50 75 100 150 200 250 510 →∞	Ref. Page
KFMS R/L-2	2.0	13	25~30	256
		14	30~35	
		16	35~45	
		20	45~60	
		20	60~80	
		20	80~100	
		20	100~130	
KFMS R/L-3	3.0	13	25~30	
		13	30~40	
		13	40~50	
		22	50~65	
		22	65~85	
		25	85~110	
		25	110~145	
KFMS R/L-4	4.0	12	25~35	
		20	35~50	
		25	50~70	
		25	70~100	
		25	100~150	
		25	150~220	
		25	220~∞	
KFMS R/L-5	5.0 6.0	20	25~35	
		20	35~50	
		25	50~75	
		25	75~115	
		25	115~180	
		25	180~235	
		25	235~∞	
KFMS R/L-8	8.0	25	54~64	258
		25	63~82	
		25	80~115	
		25	105~160	
		25	155~510	

Blade Type	Width (mm)	Depth (mm)	Face Grooving Dia. ϕD (mm) 25 50 75 100 150 200 250 510 →∞	Ref. Page
KFTB R/L-4S	4.0	25	65~100	259
		30	90~150	
		30	140~250	
		30	230~∞	
KFTB R/L-5S	5.0	30	90~150	
		32	150~250	
		38	250~∞	

System Tip-Bar for Small Diameter Face Grooving [Solid]

■ VNFG





● Right-hand Shown

● System Tip-Bar Dimension

Description		Min. Cutting Dia.	Dimension (mm)								Insert Grade				
											Cermet	PVD Coated		Carbide	Diamond
		ϕA	W±0.03	R	H	L1	L2	F	T		TC60	PR630	PR930	KW10	KPD010
VNFGR	**0810-10**	8	1.0	0.05	3.9	29.6	10	7.3	2.0		R	R	R	R	
	0820-10	8	2.0	0.05	3.9	29.6	10	7.3	2.0		R	R	R	R	
	0830-10	8	3.0	0.05	3.9	29.6	10	7.3	3.0		R	R	R	R	
VNFGR	**0810-10NB**	8	1.0	0.05	3.9	39.8	10	7.3	2.0						
	0820-10NB	8	2.0	0.05	3.9	39.8	10	7.3	2.0						△
	0830-10NB	8	3.0	0.05	3.9	39.8	10	7.3	3.0						△

● Dimension T shows available Grooving Depth

System Tip-Bar is contained in 5-pc Pack.

● See Page. 156-157 for the Applicable Toolholder.

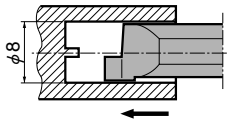
◆ Recommended Cutting Conditions

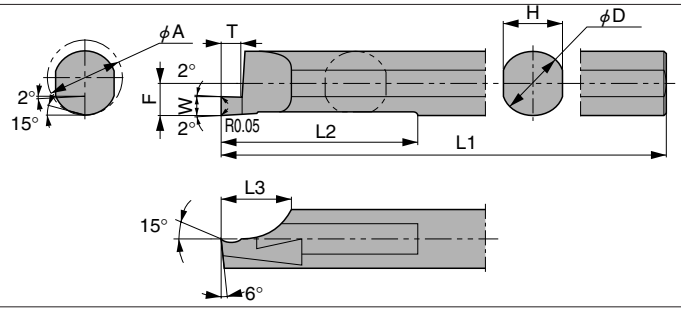
Work Material	Recommended Insert Grade (V_C m/min)				VNFG0810	VNFG0820	VNFG0830	Remark
	Cermet	PVD Coated		Carbide				
	TC60	PR630	PR930	KW10	f (mm/rev)			
General Steel (S45C etc.)	☆ 60~120	☆ 30~100	★ 30~100		~0.02	~0.04	~0.05	Wet Cutting
Stainless Steel (SUS304 etc.)	☆ 50~100	☆ 30~80	★ 30~80		~0.01	~0.02	~0.03	
Non-ferrous Metal (Aluminium,Brass etc.)				★ ~300	~0.04	~0.06	~0.08	

★ : 1st Recommendation · ☆ : 2nd Recommendation

Tip-Bar for Small Diameter Face Grooving [Solid]

■ PSFG-S





● Right-hand Shown

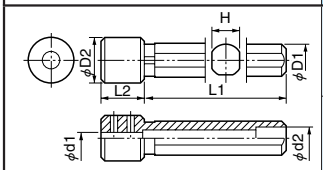
● Tip-Bar Dimension

Description		Min. Cutting Dia.	Dimension (mm)									Insert Grade			
												Cermet	PVD Coated		Carbide
		φA	W±0.03	R	φD	H	L1	L2	L3	F	T	TC60	PR630	PR930	KW10
PSFG R/L	0810-20S	8	1.0	0.05	6.8	6.2	80	25.5	7	3.4	2.0	L	○	○	●
	0820-20S	8	2.0	0.05	6.8	6.2	80	25.5	7	3.4	2.0	○	○	○	●
	0830-20S	8	3.0	0.05	6.8	6.2	80	25.5	7	3.4	2.0	○	○	○	●

● Dimension T shows available Grooving Depth

Tip-Bar is contained in 1-pc Pack.

● Applicable Sleeve

Shape	Description	(Old Description)	Stock	Dimension (mm)							Spare Parts		Applicable Tip-Bar
				φD1	φD2	φd1	φd2	H	L1	L2	Screw	Wrench	
	PH 0712-60	PH -0712	●	12	19	6.8	8	11	60	20	HS4X4	LW-2	PSFG R/L 08○○-20S
	PH 0716-80	PH -0716	●	16	22	6.8	Rp1/4 (PS1/4)	14	80	20			

◆ Recommended Cutting Conditions

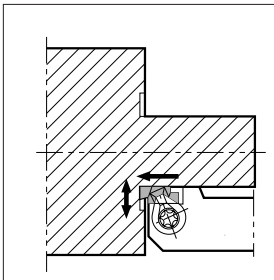
Work Material	Recommended Insert Grade (Vc m/min)				PSFG0810	PSFG0820	PSFG0830	Remark
	Cermet	PVD Coated		Carbide				
	TC60	PR630	PR930	KW10	f (mm/rev)			
General Steel (S45C etc.)	☆ 60~120	☆ 30~100	★ 30~100		~0.02	~0.04	~0.05	Wet Cutting
Stainless Steel (SUS304 etc.)	☆ 50~120	☆ 30~80	★ 30~80		~0.01	~0.02	~0.03	
Non-ferrous Metal (Aluminium,Brass etc.)				★ ~300	~0.04	~0.06	~0.08	

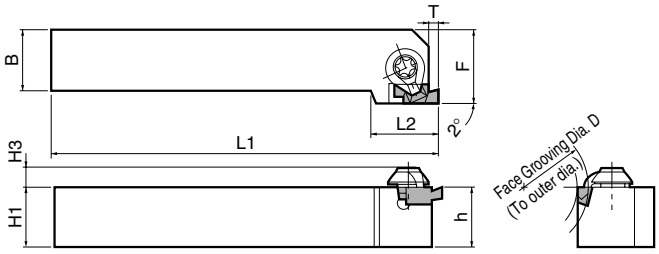
★ : 1st Recommendation · ☆ : 2nd Recommendation

● : Std. Stock ○ : Check Availability

Small Dia. Face Grooving Toolholders [GVF-AA Insert] Integral Type

■ GFVS-AA





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

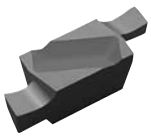
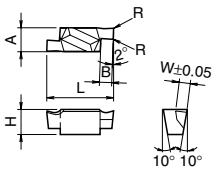
● Toolholder Dimension

Description		Stock R	Stock L	H1	h	H3	B	L1	L2	F	T	Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Spare Parts: Clamp Set	Spare Parts: Wrench	Applicable Insert
GFVS R/L	1010F-08AA	●	●	10	10	5.5	10	80	18	15	2.2	8 (0)	∞ (∞)	CPS-5V	FT-15	GVF L/R 100AA ～ GVF L/R 300AA
	1212H-08AA	●	●	12	12	5.5	12	100	18	16						
	1616H-08AA	●	●	16	16	5.5	16	100	18	20						
	2020K-08AA	○	○	20	20	5.5	20	125	18	25						
	2525M-08AA	●	○	25	25	5.5	25	150	18	32						

Note 1. Dimension T shows available Grooving Depth

Note 2. The value ( ) of Face Grooving Dia. φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN～MAX. (It is available to infinity ∞)
The value ( ) of Face Grooving Dia. φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN～MAX.

● Applicable Insert

Shape (Right-hand Shown)		Description	Dimension (mm) W	B	R	A	L	H	Insert Grade: Cermet TN60	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10
		GVF R/L 100AA	1.00										○	●	○
		200AA	2.00	2.2	0.05	4.3	12	4.5					○	●	○
		300AA	3.00										○	●	○

● Dimension B shows available Grooving Depth

Recommended Cutting Conditions P.248

◆ Face Groove Diameter of GFVS-AA type (same as GFVT-AA)

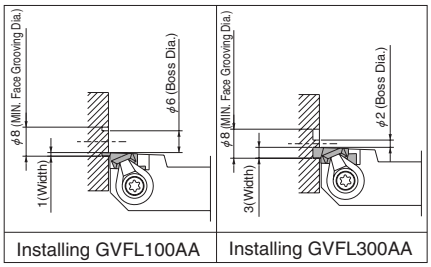
Description		Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Applicable Insert
GFVS R/L	1010F-08AA	8 (0)	∞ (∞)	GVF L/R 100AA ～ GVF L/R 300AA
	1212H-08AA			
	1616H-08AA			
	2020K-08AA			
	2525M-08AA			

● It is available to infinity ∞ in case of machining the initial groove bigger than MIN.

● It is available to infinity ∞ when widening the groove toward outer diameter.

● Means machining the initial groove on the face of MIN φ8.

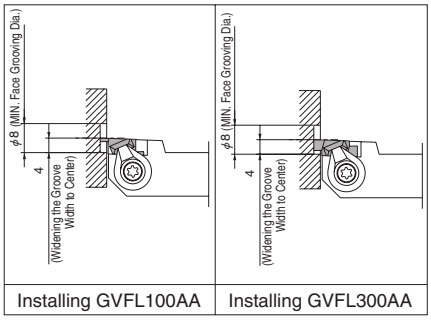
If the initial groove is made at smaller than this, toolholder interferes with the workpiece.
Boss Dia. depends on insert width.



Installing GVFL100AA | Installing GVFL300AA

● Means when widening the groove width to inner Dia.

It is available to machine up to the center of the workpiece regardless of insert width.

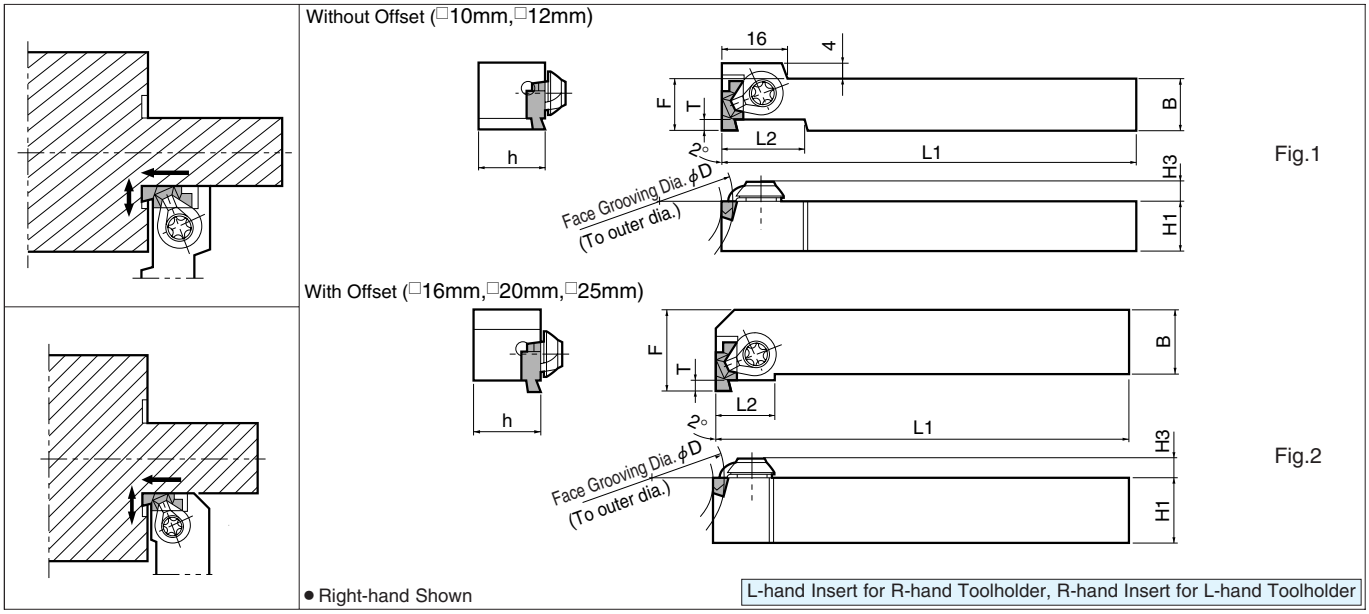


Installing GVFL100AA | Installing GVFL300AA

● : Std. Stock ○ : Check Availability

Small Dia. Face Grooving Toolholders [GVF-AA Insert] Integral Type

■ GFVT-AA



● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

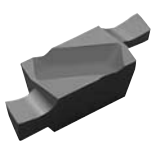
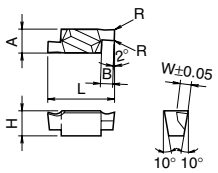
● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1	h	H3	B	L1	L2	F	T	Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Shape	Spare Parts Clamp Set	Spare Parts Wrench	Applicable Insert
GFVT R/L	1010F-08AA	●	●	10	10	5.5	10	80	20	10	2.2	8 (0)	∞ (∞)	Fig.1	CPS-5V	FT-15	GVF L/R 100AA ～ GVF L/R 300AA
	1212H-08AA	●	●	12	12	5.5	12	100	20	12							
	1616H-08AA	●	●	16	16	5.5	16	100	14	20				Fig.2			
	2020K-08AA	●	○	20	20	5.5	20	125	14	25							
	2525M-08AA	●	○	25	25	5.5	25	150	14	32							

Note 1. Dimension T shows available Grooving Depth

Note 2. The value ( ) of Face Grooving Dia. φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN～MAX. (It is available to infinity ∞)
The value ( ) of Face Grooving Dia. φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN～MAX.

● Applicable Insert

Shape (Right-hand Shown)		Description	Dimension (mm) W	B	R	A	L	H	Insert Grade Cermet TN60	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10
		GVF R/L 100AA	1.00										○	●	○
		200AA	2.00	2.2	0.05	4.3	12	4.5					○	●	○
		300AA	3.00										○	●	○

● Dimension B shows available Grooving Depth

◆ Recommended Cutting Conditions (GFVS-AA/GFVT-AA)

Work Material	Recommended Insert Grade (V_c m/min) PVD Coated PR630	PVD Coated PR930	Carbide KW10	Grooving f (mm/rev)	Traversing※ ap (mm)	Traversing※ f (mm/rev)	Remark
General Steel (S45C etc.)	☆ 50~100	★ 50~100		0.01~0.05	Max.0.5	0.01~0.05	Wet
Stainless Steel (SUS304 etc.)	☆ 50~80	★ 50~80		0.01~0.03	Max.0.3	0.01~0.02	
Non-Ferrous Metal (Aluminium,Brass etc.)			★ ~200	0.01~0.08	Max.0.5	0.01~0.08	

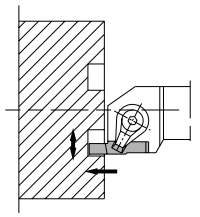
※Traversing is not available for Insert of Edge Width 1mm (GVF R/L 100AA)

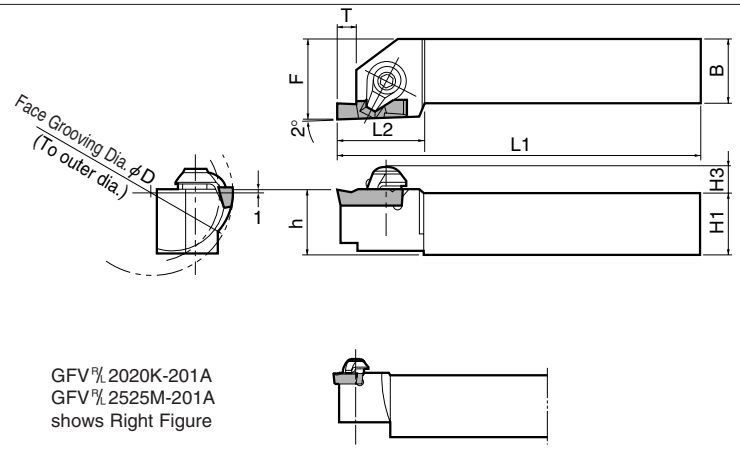
★ : 1st Recommendation · ☆ : 2nd Recommendation

● : Std. Stock ○ : Check Availability

Face Grooving Toolholders [GVF Insert] Integral Type

■ GFV





GFV R/L 2020K-201A
GFV R/L 2525M-201A
shows Right Figure

● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1	h	H3	B	L1	L2	F	T	Face Grooving Dia. φD MIN.	MAX.	Spare Parts: Clamp Set		Spare Parts: Wrench		Applicable Insert ➡ P.253
GFV R/L	2020K-201A	●	○	20	21	6.5	20	125	20	25	2.2	20 (12)	∞	CPS-5V	-	FT-15	-	GVF R/L 200A~340A GVF R/L 100AR~150AR
	2525M-201A	●	●	25	26	6.5	25	150	23	32								
GFV R/L	2020K-351B	●	○	20	21	8.0	20	125	28	25	4.6	35 (25)	50 (∞)	-	CPS-6V	-	LW-3	GVF R/L 250B~350B GVF R/L 150BR
	2525M-351B	●	○	25	26	8.0	25	150	30	32								
	2020K-352B	●	○	20	21	8.0	20	125	28	25	5.1							GVF R/L 400B~490B GVF R/L 200BR
	2525M-352B	●	○	25	26	8.0	25	150	30	32								
	2020K-501B	●	○	20	21	8.0	20	125	28	25	4.6	50 (25)	70 (∞)	-	CPS-6V	-	LW-3	GVF R/L 250B~350B GVF R/L 150BR
	2525M-501B	●	○	25	26	8.0	25	150	30	32								
	2020K-502B	●	●	20	21	8.0	20	125	28	25	5.1							GVF R/L 400B~490B GVF R/L 200BR
	2525M-502B	●	○	25	26	8.0	25	150	30	32								
	2020K-701B	●	○	20	21	8.0	20	125	28	25	4.6	70 (25)	100 (∞)	-	CPS-6V	-	LW-3	GVF R/L 250B~350B GVF R/L 150BR
	2525M-701B	●	○	25	26	8.0	25	150	30	32								
	2020K-702B	●	○	20	21	8.0	20	125	28	25	5.1							GVF R/L 400B~490B GVF R/L 200BR
	2525M-702B	●	○	25	26	8.0	25	150	30	32								
GFV R/L	2525M-501C	○	○	25	26	9.5	25	150	35	32	6.6	50 (25)	70 (∞)	-	CPS-8V	-	LW-4	GVF R/L 350C~450C
	2525M-502C	●	○	25	26	9.5	25	150	35	32	8.1							GVF R/L 500C~600C
	2525M-701C	○	○	25	26	9.5	25	150	35	32	6.6	70 (25)	100 (∞)	-	CPS-8V	-	LW-4	GVF R/L 350C~450C
	2525M-702C	○	○	25	26	9.5	25	150	35	32	8.1							GVF R/L 500C~600C
	2525M-1001C	○	○	25	26	9.5	25	150	35	32	6.6	100 (25)	150 (∞)	-	CPS-8V	-	LW-4	GVF R/L 350C~450C
	2525M-1002C	○	○	25	26	9.5	25	150	35	32	8.1							GVF R/L 500C~600C
	2525M-1501C	○	○	25	26	9.5	25	150	35	32	6.6	150 (25)	250 (∞)	-	CPS-8V	-	LW-4	GVF R/L 350C~450C
	2525M-1502C	○	○	25	26	9.5	25	150	35	32	8.1							GVF R/L 500C~600C

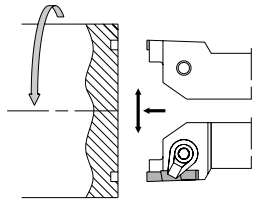
Note 1. Dimension T shows available Grooving Depth

2. The value ( ) of Face Grooving Dia. φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN~MAX. (It is available to infinity ∞)
The value ( ) of Face Grooving Dia. φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN~MAX.

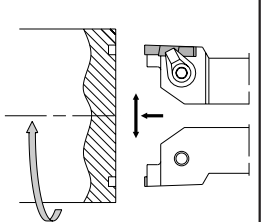
3. Standard Toolholder makes the Edge Position 1.0mm above the Center automatically. When using non-standard Toolholder, set the Edge Position 1.0mm above the Center.

◆ Selection of Insert & Toolholder

Toolholder	R-hand
Insert	R-hand



Toolholder	L-hand
Insert	L-hand



● : Std. Stock ○ : Check Availability

Face Grooving Toolholders [GVF Insert]

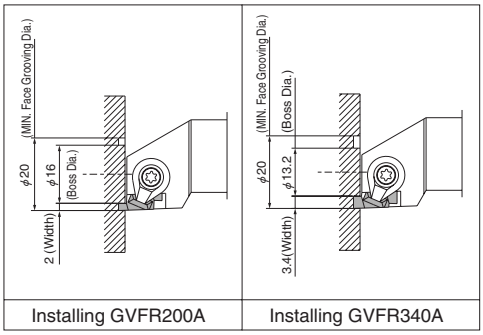
◆ Face Grooving Diameter of GFV type

① e.g.) GFV R/L ····201A

Description		Face Grooving Dia. ϕD MIN.	Face Grooving Dia. ϕD MAX.	Applicable Insert
GFV R/L	2020K-201A	20	∞	GVF R/L 200A～340A
	2525M-201A	(12)	(∞)	GVF R/L 100AR～150AR

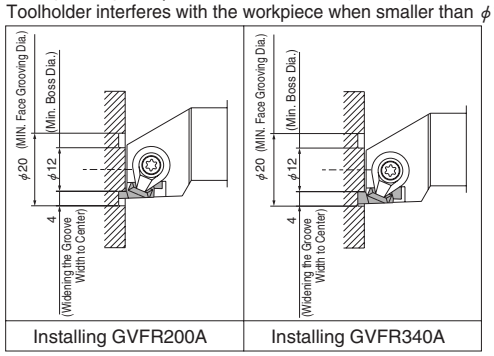
- It is available to infinity ∞ in case of machining the initial groove bigger than MIN.
- It is available to infinity ∞ when widening the groove toward outer diameter.
- Means machining the initial groove on the face of MIN. ϕ20.
- Means when widening the groove width to inner Dia.

If the initial groove is made at smaller than this, toolholder interferes with the workpiece. Boss Dia. insert depends on width.



Installing GVFR200A | Installing GVFR340A

Face grooving dia. ϕD MIN (12) is the limitation regardless of insert width. Toolholder interferes with the workpiece when smaller than ϕ12.



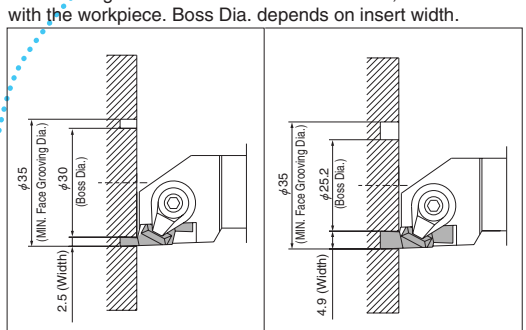
Installing GVFR200A | Installing GVFR340A

② e.g.)GFV R/L ····351B/352B (same as GFV R/L ····○○○B type, GFV R/L ····○○○C type)

Description		Face Grooving Dia. ϕD MIN.	Face Grooving Dia. ϕD MAX.	Applicable Insert
GFV R/L	2020K-351B	35	50	GVF R/L 250B～350B
	2525M-351B			GVF R/L 150BR
	2020K-352B	(25)	(∞)	GVF R/L 400B～490B
	2525M-352B			GVF R/L 200BR

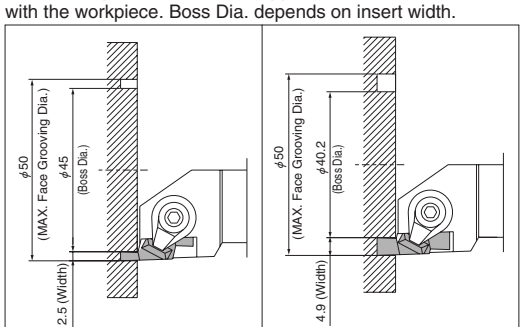
- It is available to infinity ∞ in case of machining the initial groove within MIN～MAX. then widening to outer Dia.
- Means machining the initial groove on the face of MIN. ϕ35.
- Means machining the initial groove on the face of MAX. ϕ50.

If the initial groove is made at smaller than this, toolholder interferes with the workpiece. Boss Dia. depends on insert width.



Installing GVFR250B | Installing GVFR490B

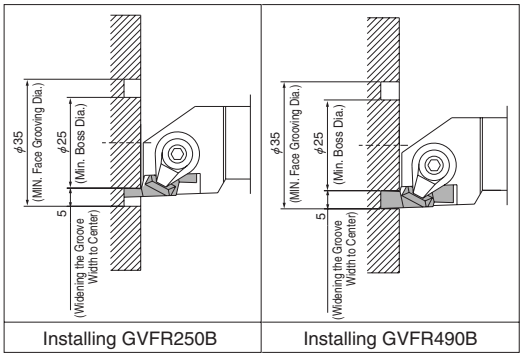
If the initial groove is made at bigger than this, toolholder interferes with the workpiece. Boss Dia. depends on insert width.



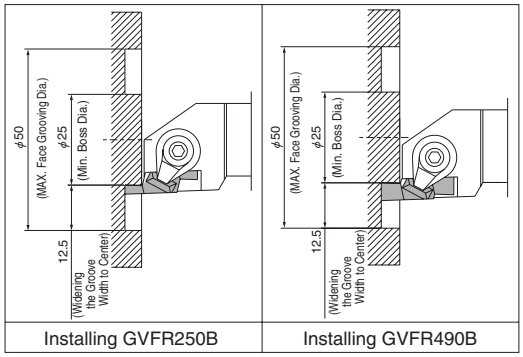
Installing GVFR250B | Installing GVFR490B

- Means when widening the groove width to inner Dia.

Face Grooving Dia. ϕD MIN (25) is the limitation regardless of insert width, even widening the groove width to the center from the initial groove at ϕD MIN. (ϕ35) or ϕD MAX. (ϕ50).
Toolholder interferes with the workpiece when smaller than ϕD25.



Installing GVFR250B | Installing GVFR490B

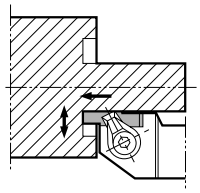


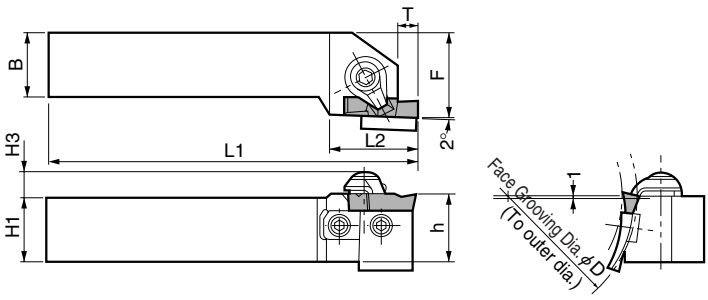
Installing GVFR250B | Installing GVFR490B

Face Grooving Toolholders [GVF Insert] Separate Type

■ GFVS

This Toolholder can cope with various face groove diameter by replacing the Blade.





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	H1	h	H3	B	L1	L2	F	T	Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Spare Parts: Clamp Set	Spare Parts: Wrench	Spare Parts: Blade	Spare Parts: Bolt	Applicable Insert (P.253)
GFVS R/L	2020K-351B	●	○	20	21	8.0	20	125	30	25	5.1 (4.6)	35 (25)	50 (∞)	CPS-6V	LW-3	SF R/L-351B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-351B	●	○	25	26	8.0	25	150	32	32								
	2020K-352B	●	○	20	21	8.0	20	125	30	25	5.1 (5.1)					SF R/L-352B		GVF L/R400B~490B GVF L/R200BR
	2525M-352B	●	○	25	26	8.0	25	150	32	32								
	2020K-501B	●	○	20	21	8.0	20	125	30	25	5.1 (4.6)	50 (25)	70 (∞)	CPS-6V	LW-3	SF R/L-501B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-501B	●	○	25	26	8.0	25	150	32	32								
	2020K-502B	●	○	20	21	8.0	20	125	30	25	5.1 (5.1)					SF R/L-502B		GVF L/R400B~490B GVF L/R200BR
	2525M-502B	●	○	25	26	8.0	25	150	32	32								
	2020K-701B	●	○	20	21	8.0	20	125	30	25	5.1 (4.6)	70 (25)	100 (∞)	CPS-6V	LW-3	SF R/L-701B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-701B	●	○	25	26	8.0	25	150	32	32								
	2020K-702B	●	○	20	21	8.0	20	125	30	25	5.1 (5.1)					SF R/L-702B		GVF L/R400B~490B GVF L/R200BR
	2525M-702B	●	○	25	26	8.0	25	150	32	32								
GFVS R/L	2525M-501C	○	○	25	26	9.5	25	150	32	32	8.1(6.6)	50 (25)	70 (∞)	CPS-8V	LW-4	SF R/L-501C	HH4X12	GVF L/R350C~450C
	2525M-502C	○	○	25	26	9.5	25	150	32	32	8.1(8.1)					SF R/L-502C		GVF L/R500C~600C
	2525M-701C	○	○	25	26	9.5	25	150	32	32	8.1(6.6)	70 (25)	100 (∞)	CPS-8V	LW-4	SF R/L-701C	HH4X12	GVF L/R350C~450C
	2525M-702C	○	○	25	26	9.5	25	150	32	32	8.1(8.1)					SF R/L-702C		GVF L/R500C~600C
	2525M-1001C	○	●	25	26	9.5	25	150	32	32	8.1(6.6)	100 (25)	150 (∞)	CPS-8V	LW-4	SF R/L-1001C	HH4X12	GVF L/R350C~450C
	2525M-1002C	○	○	25	26	9.5	25	150	32	32	8.1(8.1)					SF R/L-1002C		GVF L/R500C~600C
	2525M-1501C	●	○	25	26	9.5	25	150	32	32	8.1(6.6)	150 (25)	250 (∞)	CPS-8V	LW-4	SF R/L-1501C	HH4X12	GVF L/R350C~450C
	2525M-1502C	○	○	25	26	9.5	25	150	32	32	8.1(8.1)					SF R/L-1502C		GVF L/R500C~600C

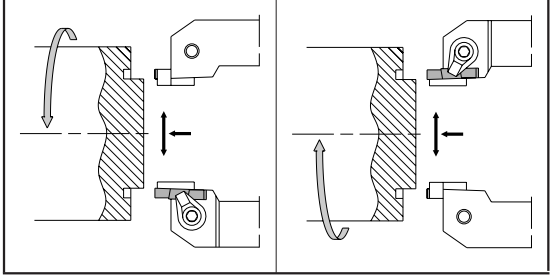
Note 1. T dimension shows the distance from toolholder to the cutting edge. The available depth is mentioned in ( ).

2. The value ( ) of Face Grooving Dia. φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN~MAX. (It is available to infinity ∞) The value ( ) of Face Grooving Dia. φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN~MAX.
3. Standard Toolholder makes the Edge Position 1.0mm above the Center automatically. When using non-standard Toolholder, set the Edge Position 1.0mm above the Center.
4. GFVS type Tool is composed of a Base Body and a Blade. If the Blade should be damaged, prepare the new Blade referring to the right Chart. e.g.) GFVSR2020K-351B = GFVSR2020K-HB + SFR-351B

◆ Selection of Insert & Toolholder

Toolholder	R-hand
Insert	L-hand

Toolholder	L-hand
Insert	R-hand



● Combination of Base Body & Blade

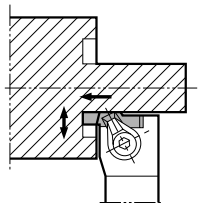
Base Body (stamped as below)	Stock R	Stock L	Blade Description	Toolholder (Integrated Tool)
GFVS R/L 2020K-HB	●	●	SF R/L -351B	GFVS R/L 2020K -351B
			-352B	-352B
			-501B	-501B
			-502B	-502B
			-701B	-701B
			-702B	-702B
GFVS R/L 2525M-HB	●	●	SF R/L -351B	GFVS R/L 2525M -351B
			-352B	-352B
			-501B	-501B
			-502B	-502B
			-701B	-701B
			-702B	-702B
GFVS R/L 2525M-HC	○	○	SF R/L -501C	GFVS R/L 2525M -501C
			-502C	-502C
			-701C	-701C
			-702C	-702C
			-1001C	-1001C
			-1002C	-1002C
			-1501C	-1501C
			-1502C	-1502C

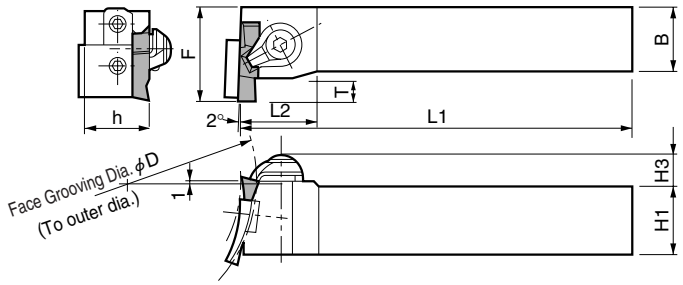
· R-hand Blade for R-hand Toolholder, L-hand Blade for L-hand Toolholder

● : Std. Stock ○ : Check Availability

■ GFVT

This Toolholder can cope with various face groove diameter by replacing the Blade.





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

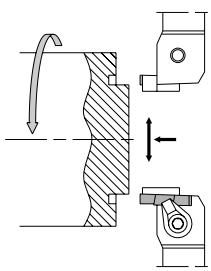
Description		Stock R	Stock L	Dimension (mm) H1	h	H3	B	L1	L2	F	T	Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Spare Parts: Clamp Set	Spare Parts: Wrench	Spare Parts: Blade	Spare Parts: Bolt	Applicable Insert (P.253)
GFVT R/L	2020K-351B	●	○	20	21	8.0	20	125	22	30	5.1 (4.6)	35 (25)	50 (∞)	CPS-6V	LW-3	SF R/L-351B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-351B	●	○	25	26	8.0	25	150	25	35								
	2020K-352B	●	○	20	21	8.0	20	125	22	30	5.1 (5.1)					SF R/L-352B		GVF L/R400B~490B GVF L/R200BR
	2525M-352B	●	○	25	26	8.0	25	150	25	35								
	2020K-501B	●	○	20	21	8.0	20	125	22	30	5.1 (4.6)	50 (25)	70 (∞)	CPS-6V	LW-3	SF R/L-501B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-501B	●	○	25	26	8.0	25	150	25	35								
	2020K-502B	●	○	20	21	8.0	20	125	22	30	5.1 (5.1)					SF R/L-502B		GVF L/R400B~490B GVF L/R200BR
	2525M-502B	●	○	25	26	8.0	25	150	25	35								
	2020K-701B	●	○	20	21	8.0	20	125	22	30	5.1 (4.6)	70 (25)	100 (∞)	CPS-6V	LW-3	SF R/L-701B	HH4X12	GVF L/R250B~350B GVF L/R150BR
	2525M-701B	●	○	25	26	8.0	25	150	25	35								
	2020K-702B	●	○	20	21	8.0	20	125	22	30	5.1 (5.1)					SF R/L-702B		GVF L/R400B~490B GVF L/R200BR
	2525M-702B	●	○	25	26	8.0	25	150	25	35								
GFVT R/L	2525M-501C	○	○	25	26	9.5	25	150	27	38	8.1(6.6)	50 (25)	70 (∞)	CPS-8V	LW-4	SF R/L-501C	HH4X12	GVF L/R350C~450C
	2525M-502C	○	○	25	26	9.5	25	150	27	38	8.1(8.1)					SF R/L-502C		GVF L/R500C~600C
	2525M-701C	○	○	25	26	9.5	25	150	27	38	8.1(6.6)	70 (25)	100 (∞)	CPS-8V	LW-4	SF R/L-701C	HH4X12	GVF L/R350C~450C
	2525M-702C	○	○	25	26	9.5	25	150	27	38	8.1(8.1)					SF R/L-702C		GVF L/R500C~600C
	2525M-1001C	○	○	25	26	9.5	25	150	27	38	8.1(6.6)	100 (25)	150 (∞)	CPS-8V	LW-4	SF R/L-1001C	HH4X12	GVF L/R350C~450C
	2525M-1002C	○	○	25	26	9.5	25	150	27	38	8.1(8.1)					SF R/L-1002C		GVF L/R500C~600C
	2525M-1501C	○	○	25	26	9.5	25	150	27	38	8.1(6.6)	150 (25)	250 (∞)	CPS-8V	LW-4	SF R/L-1501C	HH4X12	GVF L/R350C~450C
	2525M-1502C	○	○	25	26	9.5	25	150	27	38	8.1(8.1)					SF R/L-1502C		GVF L/R500C~600C

Note 1. T dimension shows the distance from toolholder to the cutting edge. The available depth is mentioned in ( ).

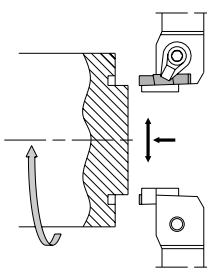
2. The value ( ) of Face Grooving Dia. φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN~MAX. (It is available to infinity ∞) The value ( ) of Face Grooving Dia. φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN~MAX.
3. Standard Toolholder makes the Edge Position 1.0mm above the Center automatically. When using non-standard Toolholder, set the Edge Position 1.0mm above the Center.
4. GFVS type Tool is composed of a Base Body and a Blade. If the Blade should be damaged, prepare the new Blade referring to the right Chart. e.g.) GFVTR2020K-351B = GFVTR2020K-HB + SFR-351B

◆ Selection of Insert & Toolholder

Toolholder	R-hand
Insert	L-hand



Toolholder	L-hand
Insert	R-hand



● Combination of Base Body & Blade

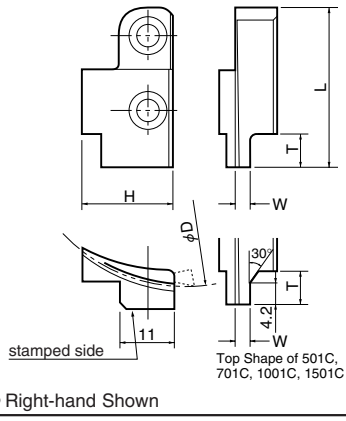
Base Body (stamped as below)	Stock R	Stock L	Blade Description		Toolholder (Integrated Tool)	
GFVT R/L 2020K-HB	●	●	SF R/L	-351B	GFVT R/L 2020K	-351B
				-352B		-352B
				-501B		-501B
				-502B		-502B
				-701B		-701B
				-702B		-702B
GFVT R/L 2525M-HB	●	●	SF R/L	-351B	GFVT R/L 2525M	-351B
				-352B		-352B
				-501B		-501B
				-502B		-502B
				-701B		-701B
				-702B		-702B
GFVT R/L 2525M-HC	○	○	SF R/L	-501C	GFVT R/L 2525M	-501C
				-502C		-502C
				-701C		-701C
				-702C		-702C
				-1001C		-1001C
				-1002C		-1002C
				-1501C		-1501C
				-1502C		-1502C

· R-hand Blade for R-hand Toolholder, L-hand Blade for L-hand Toolholder

● : Std. Stock ○ : Check Availability

Face Grooving Toolholders

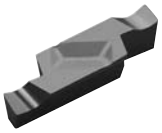
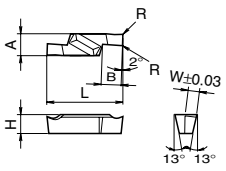
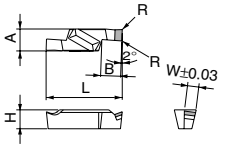
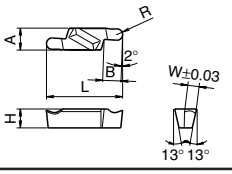
● Blade Dimension

Shape	Description	Stock R	Stock L	Dimension (mm) L	H	T	W	Face Grooving Dia. φD MIN.	Face Grooving Dia. φD MAX.	Applicable Insert	Applicable Toolholder
	SF R/L -351B	●	●	30.5	11	4.7	2.0	35	50	GVF R/L 250B~350B	GFV(S/T) R/L ○○○○□-○○○B (Toolholder Stamp GFV(S/T) R/L ○○○○□-HB)
	-352B	●	●				3.4			GVF R/L 400B~490B	
	SF R/L -501B	●	●		15		2.0	50	70	GVF R/L 250B~350B	
	-502B	●	●				3.4			GVF R/L 400B~490B	
	SF R/L -701B	●	●		17		2.0	70	100	GVF R/L 250B~350B	
	-702B	●	●				3.4			GVF R/L 400B~490B	
	SF R/L -501C	○	○	35	15	7.5	2.8	50	70	GVF R/L 350C~450C	GFV(S/T) R/L ○○○○□-○○○C (Toolholder Stamp GFV(S/T) R/L ○○○○□-HC)
	-502C	○	●				4.3			GVF R/L 500C~600C	
	SF R/L -701C	●	○		20		2.8	70	100	GVF R/L 350C~450C	
	-702C	○	●				4.3			GVF R/L 500C~600C	
	SF R/L -1001C	●	●		23		2.8	100	150	GVF R/L 350C~450C	
	-1002C	○	○				4.3			GVF R/L 500C~600C	
	SF R/L -1501C	○	○		23		2.8	150	250	GVF R/L 350C~450C	
	-1502C	○	○				4.3			GVF R/L 500C~600C	

● Right-hand Shown

· R-hand Blade for R-hand Toolholder, L-hand Blade for L-hand Toolholder

● Applicable Insert

Shape (Right-hand Shown)	Description	W	B	R	A	L	H	Insert Grade: Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10	Diamond KPD010
 	GVF R/L 200A	2.00	2.3	0.2	4.3	12	4.5		○	○	●		○	○	R	
	230A	2.30							-	○	○		○	○	R	
	250A	2.50							R	○	●		○	○	○	
	270A	2.70							-	○	○		○	○	○	
	290A	2.90							-	○	○		○	○	○	
	340A	3.40							-	○	○		○	○	○	
	GVF R/L 250B	2.50	4.8	0.2	5.8	20	5.0		○	○	●		○	○	○	
	300B	3.00							○	○	●		○	○	○	
	350B	3.50							○	○	●		○	○	○	
	400B	4.00	5.3	0.2	5.8	20	5.0		○	○	●		○	○	L	
	430B	4.30							-	○	○		○	○	○	
	460B	4.60							-	○	R		○	○	○	
	490B	4.90							-	○	L		○	○	○	
	GVF R/L 350C	3.50	6.8	0.4	7.0	27	7.0		○	○	○		○	○	○	
	400C	4.00							○	○	R		○	R	○	
	450C	4.50							-	○	○		○	○	○	
	500C	5.00	8.3	0.4	7.0	27	7.0		○	○	○		○	○	○	
	550C	5.50							-	○	○		○	R	○	
	600C	6.00							-	○	○		○	○	○	
 1-Corner Use 	GVF R/L 250B	2.50	4.8	0.2	5.8	20	5.0									△
	300B	3.00														△
	400B	4.00	5.3													△
	GVF R/L 350C	3.50	6.8	0.2	7.0	27	7.0									△
	400C	4.00														△
 Full-R 	GVF R/L 100AR	2.00	2.3	1.00	4.3	12	4.5						○	●	○	
	125AR	2.50		1.25									○	R	○	
	150AR	3.00		1.50									○	R	○	
	GVF R/L 150BR	3.00	4.8	1.50	5.8	20	5.0						○	○	○	
	200BR	4.00	5.3	2.00									○	R	○	

Recommended Cutting Conditions P.262

● : Std. Stock ○ : Check Availability R : R-hand Only △: Made-to-Order

Face Grooving Toolholders

◆ Face Groove Diameter of GFVS/GFVT type

e.g.)GFVS$^{R}_{L}$····-351B/352B

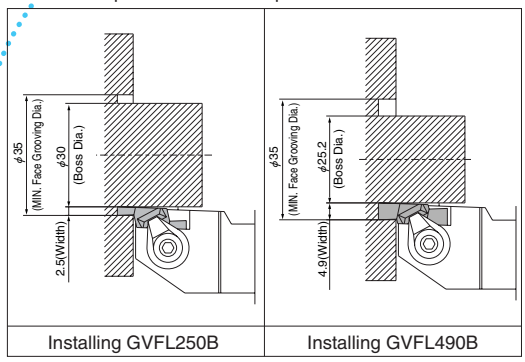
(same as GFVS$^{R}_{L}$····○○○B type, GFVS$^{R}_{L}$····○○○C type ➔ P.251
GFVT$^{R}_{L}$····○○○B type, GFVT$^{R}_{L}$····○○○C type ➔ P.252)

Description		Face Grooving Dia. ϕD MIN.	Face Grooving Dia. ϕD MAX.	Applicable Insert
GFVS$^{R}_{L}$	2020K-351B	35	50	GVF$^{L}_{R}$250B～350B
	2525M-351B			GVF$^{L}_{R}$150BR
	2020K-352B	(25)	(∞)	GVF$^{L}_{R}$400B～490B
	2525M-352B			GVF$^{L}_{R}$200BR

● It is available to infinity ∞ in case of machining the initial groove within MIN～MAX. then widening to outer Dia.

● Means machining the initial groove on the face of MIN. ϕ35.

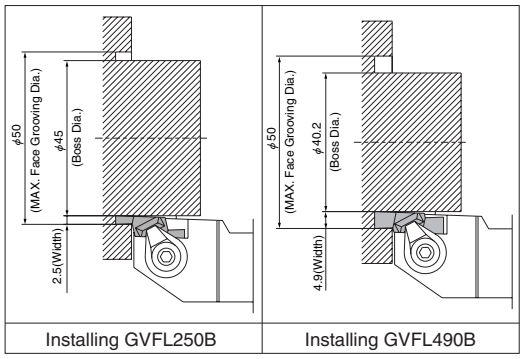
If the initial groove is made at smaller than this, toolholder interferes with the workpiece. Boss Dia. depends on insert width.



Installing GVFL250B　Installing GVFL490B

● Means machining the initial groove on the face of MAX. ϕ50.

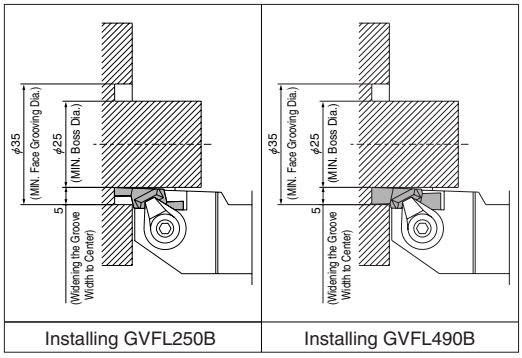
If the initial groove is made at bigger than this, toolholder interferes with the workpiece. Boss Dia. depends on insert width.



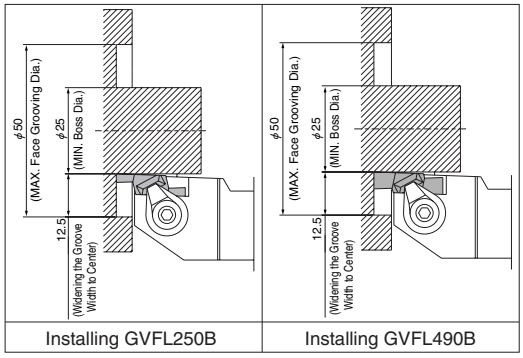
Installing GVFL250B　Installing GVFL490B

● Means when widening the groove width to inner Dia.

Face Grooving Dia. ϕD MIN. (25) is the limitation regardless of insert width, even widening the groove width to the center from the initial groove at ϕD MIN. (ϕ35) or ϕD MAX. (ϕ50).
Toolholder interferes with the workpiece when smaller than ϕ25.



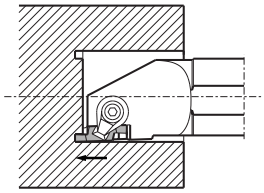
Installing GVFL250B　Installing GVFL490B

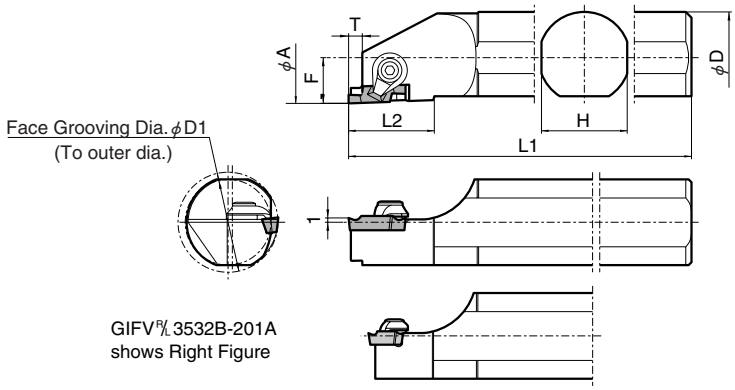


Installing GVFL250B　Installing GVFL490B

Face Grooving Toolholders (Round Shank) [GVF Insert] Integral Type

■ GIFV

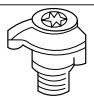
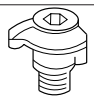
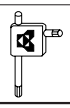
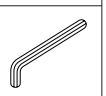




● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

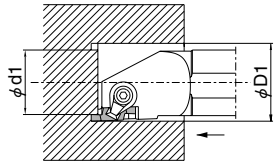
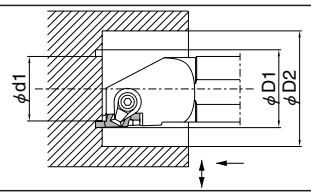
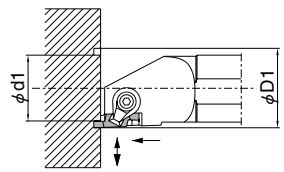
● Toolholder Dimension

Description		Stock		Dimension (mm)							Face Grooving Dia. φD1		Spare Parts				Applicable Insert ☞ P. 253
													Clamp Set		Wrench		
		R	L	φA	φD	H	L1	L2	F	T	MIN.	MAX.					
GIFV R/L	3532B-201A	○	○	35	32	30	250	23	16	2.2	35 (12)	∞	CPS-5V	-	FT-15	-	GVF R/L 200A~340A GVF R/L 100AR~150AR
GIFV R/L	3532B-351B	○	○	35	32	30	250	30	16	4.6	35 (25)	50 (∞)	-	CPS-6V	-	LW-3	GVF R/L 250B~350B GVF R/L 150BR
	3532B-352B	○	○	35	32	30	250	30	16	5.1	35 (25)	50 (∞)	-	CPS-6V	-	LW-3	GVF R/L 400B~490B GVF R/L 200BR
	5032B-501B	○	○	50	32	30	250	30	16	4.6	50 (25)	70 (∞)	-	CPS-6V	-	LW-3	GVF R/L 250B~350B GVF R/L 150BR
	5032B-502B	○	○	50	32	30	250	30	16	5.1	50 (25)	70 (∞)	-	CPS-6V	-	LW-3	GVF R/L 400B~490B GVF R/L 200BR
GIFV R/L	5032B-501C	○	○	50	32	30	250	35	16	6.6	50 (25)	70 (∞)	-	CPS-6V	-	LW-3	GVF R/L 350C~450C
	5032B-502C	○	○	50	32	30	250	35	16	8.1	50 (25)	70 (∞)	-	CPS-6V	-	LW-3	GVF R/L 500C~600C

Note 1. Dimension T shows available Grooving Depth

Note 2. Standard Toolholder makes the Edge Position 1.0mm above the Center automatically.

◆ Face Groove Dia. φD1 depends on Application

Application	Description		Face Grooving Dia. φd1	Face Grooving Dia. φD1			Remark
			(MIN.)	MIN.	MAX.	(MAX.)	
	GIFV R/L	3532B-201A	-	35	∞	∞	—
	GIFV R/L	3532B-351B	-	35	50	∞	
		3532B-352B	-	35	50	∞	
		5032B-501B	-	50	70	∞	
		5032B-502B	-	50	70	∞	
	GIFV R/L	5032B-501C	-	50	70	∞	
		5032B-502C	-	50	70	∞	
	GIFV R/L	3532B-201A	12	35	∞	∞	If φD2≧58-2W, the Face Grooving Dia. can be expanded to φd1(MIN.) toward the Center. W = Edge Width
	GIFV R/L	3532B-351B	25	35	50	∞	
		3532B-352B	25	35	50	∞	
		5032B-501B	25	50	70	∞	If φD2≧75-2W, the Face Grooving Dia. can be expanded to φd1(MIN.) toward the Center. W=Edge Width
		5032B-502B	25	50	70	∞	
	GIFV R/L	5032B-501C	25	50	70	∞	
		5032B-502C	25	50	70	∞	
	GIFV R/L	3532B-201A	12	35	∞	∞	—
	GIFV R/L	3532B-351B	25	35	50	∞	
		3532B-352B	25	35	50	∞	
		5032B-501B	25	50	70	∞	
		5032B-502B	25	50	70	∞	
	GIFV R/L	5032B-501C	25	50	70	∞	
		5032B-502C	25	50	70	∞	

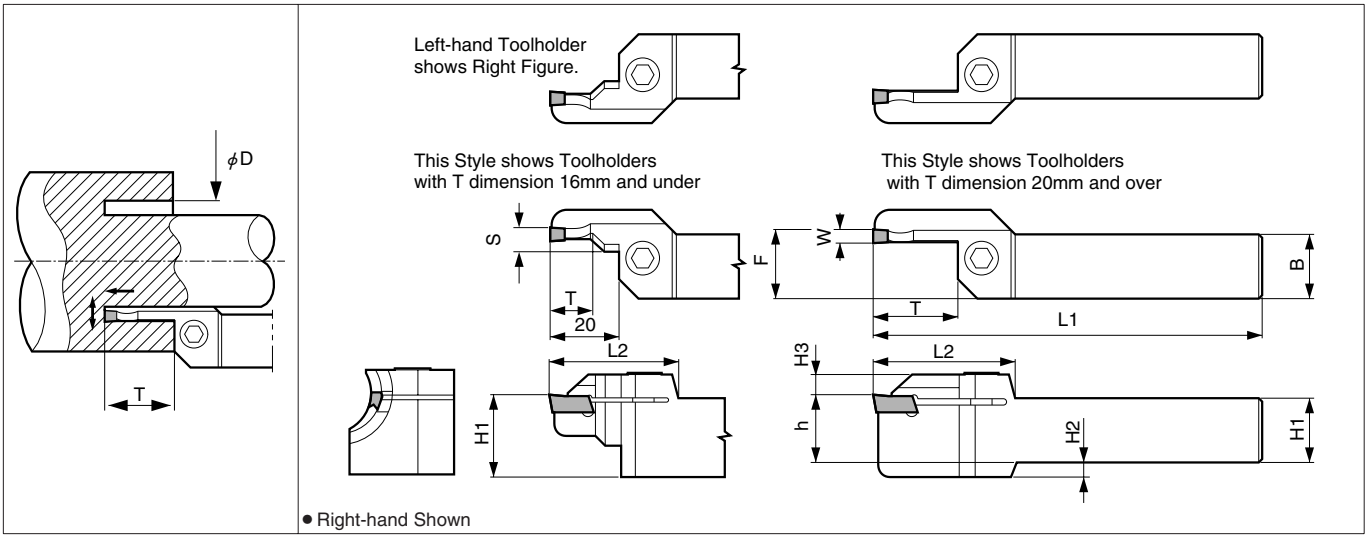
· The Value ( ) of Face Grooving Diameter φD1 Max is the Maximum one when widening Grooving Width to Outer Dia. value after initial grooving within MIN~MAX. (It is available to infinity ∞)

· The Value ( ) of Face Grooving Diameter φd1 Min. is the Minimum Diameter of the Boss which remains in the Center when widening Groove Width to Inner Dia. value after initial grooving within MIN~MAX.

● : Std. Stock ○ : Check Availability

Face Grooving Toolholders

■ KFMS



● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F	S	T	Width (mm) W	Face Grooving Dia. φD MIN.	φD MAX.	Spare Parts Screw	Wrench	Washer
KFMS R/L	2020K2530-2	●	●	20	-	10	20	125	39	20.7	5.1	13	2	25	30	HH5X20	LW-4	W6-14
	2020K3035-2	●										14		30	35			
	2020K3545-2	●										16		35	45			
	2020K4560-2	●									-	20		45	60			
	2020K6080-2	●												60	80			
	2020K80100-2	●												80	100			
	2020K100130-2	○												100	130			
	2525M2530-2	●	●	25	-	10	25	150	39	25.7	5.1	13		25	30	HH5X25	LW-4	W6-14
	2525M3035-2	●	●									14		30	35			
	2525M3545-2	○	●									16		35	45			
	2525M4560-2	●	●								-	20		45	60			
	2525M6080-2	●												60	80			
	2525M80100-2	●	●											80	100			
	2525M100130-2	○												100	130			
KFMS R/L	2020K2530-3	●	●	20	-	10	20	125	39	20.7	6.1	13	3	25	30	HH5X20	LW-4	-
	2020K3040-3	●												30	40			
	2020K4050-3	●	●											40	50			
	2020K5065-3	●							41		-	22		50	65			
	2020K6585-3	●												65	85			
	2020K85110-3	●			5				44			25		85	110			
	2020K110145-3	○												110	145			
	2525M2530-3	●	●	25	-	10	25	150	39	25.7	6.1	13		25	30	HH5X25	LW-4	
	2525M3040-3	●	●											30	40			
	2525M4050-3	●	○											40	50			
	2525M5065-3	●	●						41		-	22		50	65			
	2525M6585-3	●	○											65	85			
	2525M85110-3	●	●						44			25		85	110			
	2525M110145-3	●	○											110	145			
KFMS R/L	2020K2535-4	○		20	-	10	20	125	39	20.7	7.1	12	4	25	35	HH5X20	LW-4	-
	2020K3550-4	●										20		35	50			
	2020K5070-4	●									-			50	70			
	2020K70100-4	○										25		70	100			
	2020K100150-4	○			5				44					100	150			
	2020K150220-4	○												150	220			
	2020K220800-4	○												220	∞			
	2525M2535-4	●	●	25	-	10	25	150	39	25.7	7.1	12		25	35	HH5X25	LW-4	
	2525M3550-4	●	●									20		35	50			
	2525M5070-4	●	●								-			50	70			
	2525M70100-4	●	●									25		70	100			
	2525M100150-4	●	●						44					100	150			
	2525M150220-4	●	●											150	220			
	2525M220800-4	●	●											220	∞			

● : Std. Stock ○ : Check Availability

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F	S	T	Width (mm) W	Face Grooving Dia. φD MIN.	MAX.	Spare Parts Screw	Wrench	Washer
KFMS R/L	2020K2535-5	○		20	-	10	20	125	39	20.7 (21.2)	-	20	5 (6)	25	35	HH5X20	LW-4	-
	2020K3550-5	●												35	50			
	2020K5075-5	●							44			25		50	75			
	2020K75115-5	●			5	10								75	115			
	2020K115180-5	○												115	180			
	2020K180235-5	○												180	235			
	2020K235800-5	○												235	∞			
	2525M2535-5	●	●	25	-	10	25	150	39	25.7 (26.2)	-	20		25	35	HH5X25	LW-4	
	2525M3550-5	●	○											35	50			
	2525M5075-5	●	●						44			25		50	75			
	2525M75115-5	●	●											75	115			
	2525M115180-5	●	●						51			32		115	180			
	2525M180235-5	●	○											180	235			
	2525M235800-5	●	●											235	∞			

· Dimension T shows available Grooving Depth

· Face Grooving Dia. φD: The Diameter Range of the initial Grooving

· KFMS R/L ··· -5 type Toolholder can install 6mm Width Insert. ( ) value shows the Dimension with 6mm Width Iinsert

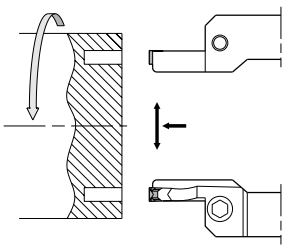
● Applicable Insert

Application	Grooving/Traversing	Grooving
Ref. Page	257	257
Shape / Toolholder		
KFMS R/L ···2	FMM20-02	-
KFMS R/L ···3	FMM30-03	FMN3
KFMS R/L ···4	FMM40-04	FMN4
KFMS R/L ···5	FMM50-04 FMM60-04	FMN5 FMN6

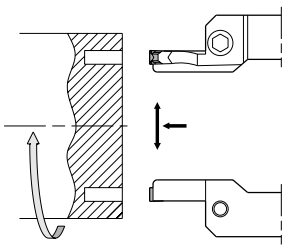
· FMM20-02 and FMN type Inserts are only for Deep Grooving and not available to traversing.

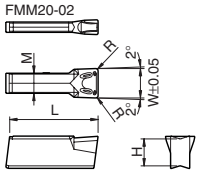
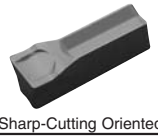
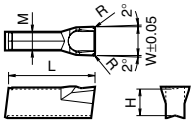
◆ Selection of Insert & Toolholder

Toolholder	R-hand
Insert	(No Hand)



Toolholder	L-hand
Insert	(No Hand)

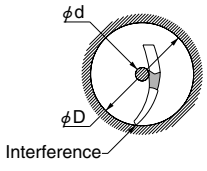


Shape		Description		Dimension (mm) W	R	L	H	M	Angle (°) θ	Insert Grade Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
 FMM20-02 Chip Control Oriented	 FMM20-02	FMM	20-02	2.0	0.2	12	3.5	1.4	-	○	●		○	○		
			30-03	3.0	0.3	12	3.5	2.0	-	○	●	○	●	●		
			40-04	4.0	0.4	12	3.5	2.6	-	○	●	○	●	●		
			50-04	5.0	0.4	12	3.5	3.4	-	○	●	○	●	●		
			60-04	6.0	0.4	12	3.5	4.0	-	○	●		●	●		
 Sharp-Cutting Oriented		FMN	3	3.0	0.25	12	3.5	2.0	-	○	○		○	○		
			4	4.0	0.25	12	3.5	2.6	-	○	○		○	○		
			5	5.0	0.25	12	3.5	3.4	-	○	○		○	○		
			6	6.0	0.25	12	3.5	4.0	-		○		○	○		

Recommended Cutting Conditions P.264

◆ Limit of Traversing toward Center

Traversing toward the Center causes Toolholder's Interference with Groove Wall depending on the initial Grooving Diameter



Remaining Boss Dia. φd

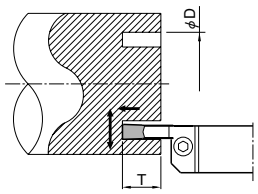
Description \ φD	25	26	27	28 and over
	φd			
KFMS R/L 2020K2530-3 KFMS R/L 2525M2530-3	4	2	0	0
KFMS R/L 2020K2535-4 KFMS R/L 2525M2535-4	6	3	0	No remaining Boss
KFMS R/L 2020K2535-5 KFMS R/L 2535M2535-5	7 ※(5)	4 ※(2)	1 ※(0)	

※ ( ) value shows the Dimension using FMM60-04 Insert

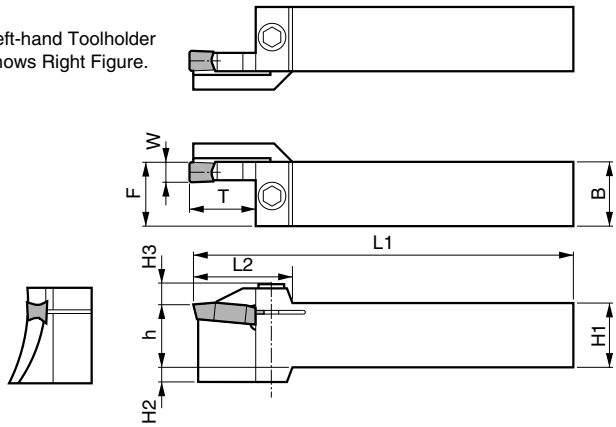
e.g.) In case KFMSR2525M2530-3 with φ25 as initial Grooving turns toward the Center, the Insert Support Part will interfere with φ25 Groove Wall when φd becomes 4mm. However, if the initial Grooving φD was 27mm and above, it can Grooving traversely toward the Center without interference.

● : Std. Stock ○ : Check Availability

■ KFMS-8



Left-hand Toolholder shows Right Figure.



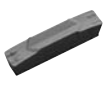
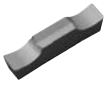
● Right-hand Shown

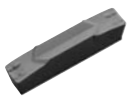
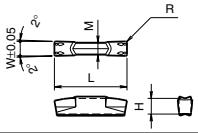
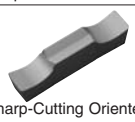
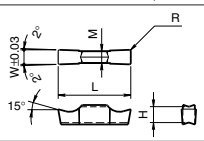
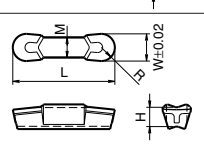
● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F	T		Width (mm) W	Face Grooving Dia. φD MIN.	MAX.	Spare Parts Screw	Wrench		
KFMS R/L	2525M5464-8	●	●	25	-	9	25	150	41	26	25		8	54 (0)	64 (∞)	HH6X25	LW-5		
	2525M6382-8	●	●	25	-	9	25	150	41	26				63 (0)	82 (∞)				
	2525M80115-8	●	●	25	6	8	25	150	40	26				80 (0)	115 (∞)				
	2525M105160-8	●	●	25	6	8	25	150	40	26				105 (0)	160 (∞)				
	2525M155510-8	●	●	25	6	8	25	150	40	26				155 (0)	510 (∞)				
	3232P 155510-8	●	●	32	-	8	32	170	40	33									

· Dimension T shows available Grooving Depth
· The value ( ) of Face Grooving Diameter φD Max is the Maximum one when widening the Grooving Width to Outer Dia. value after initial grooving within MIN~MAX. (It is available to infinity ∞)
· The value ( ) of Face Grooving Diameter φD Min is the Minimum Diameter of the Boss which remains in the Center when widening the Groove Width to Inner Dia. value after initial grooving within MIN~MAX.

● Applicable Insert

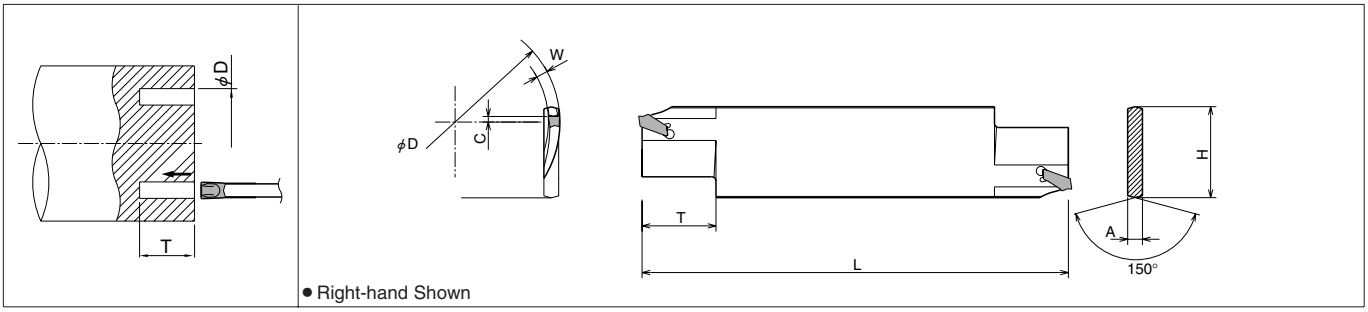
Application	Grooving/Traversing	Grooving	Full-R/Copying
Ref. Page	258	258	258
Shape / Toolholder			
KFMS R/L ···8	GMM8030-08	GMG8030-05MG	GMGA8030-40R

Shape		Description		Dimension (mm) W	R	L	H	M	Angle (°) θ	Insert Grade Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
 Chip Control Oriented		GMM	8030-08	8.0	0.8	30	5.5	6.0	-		●	●	●	●		
 Sharp-Cutting Oriented Ground Chipbreaker		GMG	8030-05MG	8.0	0.5	30	5.5	6.0	-	○	○		○	●		
 Sharp-Cutting Oriented Full-R/Copying		GMGA	8030-40R	8.0	4.0	30	5.5	6.0	-					●		

Recommended Cutting Conditions ➡ P.264

● : Std. Stock ○ : Check Availability

■ KFTB-S



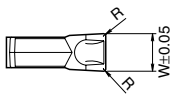
● Right-hand Shown

● Blade Dimension

Description		Stock R	Stock L	Dimension (mm) H	L	A	T	C	Width W	Face Grooving Dia. φD MIN.	MAX.	Spare Parts Wrench	Applicable Insert	Applicable Block ➡ P.276
KFTBR/L	65100-4S	●	○	32	150	5.2	25	4	4.0	65	100	LTK-5	FTK4	KTKTB20-32 25-32 32-32 KTKTBF25-32 32-32
	90150-4S	●	○	32	150	5.2	30	0		90	150			
	150250-4S	●	○	32	150	5.2	30	0		140	250			
	250800-4S	○	○	32	150	3.2	30	0		230	∞			
KFTBR/L	90150-5S	●	●	32	150	5.2	30	0	5.0	90	150	LTK-5	FTK5	
	150250-5S	●	●	32	150	5.2	32	0		150	250			
	250800-5S	●	●	32	150	4.0	38	0		250	∞			

· Dimension T shows available Grooving Depth
· Face Grooving Dia. φD: The Diameter Range of the initial Grooving
· The Insert is just placed in the pocket and it is not suitable for accurate depth grooving such as groove depth tolerance ±0.05mm.
· KFTBR/L 65100-4S makes the Edge Position 4.0mm above the Center automatically.

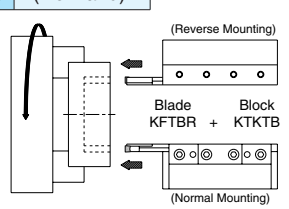
● Applicable Insert

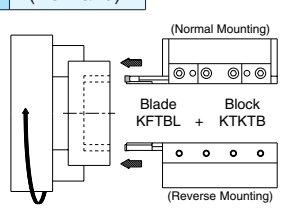
Shape		Description	Dimension (mm) W	Dimension (mm) R	Angle (°) θ	Insert Grade Cermet TN90	CVD Coated CR9025	PVD Coated PR660	PVD Coated PR930	Carbide KW10
		FTK 4	4.0	0.25	-	○	○	●	○	○
		FTK 5	5.0			○	●	●	○	●

Recommended Cutting Conditions ➡ P.264

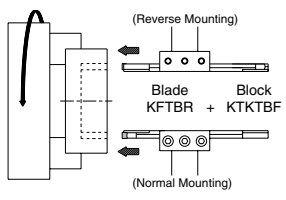
◆ Selection of Insert & Blade

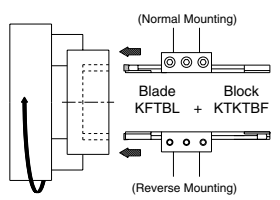
Blade	R-hand	Blade	L-hand
Insert	(No Hand)	Insert	(No Hand)





Blade	R-hand	Blade	L-hand
Insert	(No Hand)	Insert	(No Hand)





● : Std. Stock ○ : Check Availability

Recommended Cutting Conditions

◆ GBA (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet			PVD Coated		Carbide	CBN	Diamond						
	TN90	TC40	TC60	PR630	PR930	KW10	KBN10B	KPD010 KPD001	GBA○○R/L 050～120	GBA○○R/L 125～225	GBA○○R/L 230～325	GBA○○R/L 330～400	GBA○○R/L 400～480	
Carbon Steel (SxxC etc.)	☆ 150~220	-	-	☆ 80~180	★ 80~200	-	-	-	①0.03～0.08 ②Traversing N.A. ③Traversing N.A.	①0.04～0.09 ②0.04～0.09 ③Max. 0.3	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.8	Wet Cutting
Alloy Steel (SCM etc.)	☆ 130~200	-	-	☆ 80~160	★ 80~180	-	-	-	①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.8	
Stainless Steel (SUS304 etc.)	☆ 70~150	-	-	☆ 60~130	★ 60~150	-	-	-	①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.8	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	★ 60~100	★ 150~400	-	①0.03～0.08 ②Traversing N.A. ③Traversing N.A.	①0.04～0.09 ②0.04～0.09 ③Max. 0.3	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.8	
Aluminium	-	-	-	-	-	★ 150~400	-	★ 150~2000	①0.05～0.12 ②Traversing N.A. ③Traversing N.A.	①0.05～0.15 ②0.05～0.15 ③Max. 0.5	①0.05～0.15 ②0.05～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	
Brass	-	-	-	-	-	★ 150~300	-	★ 200~800	①0.05～0.12 ②Traversing N.A. ③Traversing N.A.	①0.05～0.15 ②0.05～0.15 ③Max. 0.8	①0.05～0.15 ②0.05～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	
High Hard Mat'l	-	-	-	-	-	-	★ 80~120	-	-	①0.02～0.05 ②Traversing N.A. ③Traversing N.A.	①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	-	-	

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation · ☆ : 2nd Recommendation

◆ GBA (MY Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f Rate at Grooving (mm/rev) ②f Rate at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet			PVD Coated		Carbide	CBN	Diamond						
	TN90	TC40	TC60	PR630	PR930	KW10	KBN10B	KPD010	GBA43R/L 200MY	GBA43R/L 250MY	GBA43R/L 300MY	GBA43R/L 350MY	GBA43R/L 400MY	
Carbon Steel (SxxC etc.)	-	-	-	-	★ 80~200	-	-	-	①0.03～0.08 ②0.03～0.08 ③Max. 0.3	①0.04～0.09 ②0.04～0.09 ③Max. 0.3	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	Wet Cutting
Alloy Steel (SCM etc.)	-	-	-	-	★ 80~180	-	-	-	①0.03～0.07 ②0.03～0.1 ③Max. 0.3	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	
Stainless Steel (SUS304 etc.)	-	-	-	-	★ 60~150	-	-	-	①0.03～0.07 ②0.03～0.1 ③Max. 0.3	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation · ☆ : 2nd Recommendation

◆ GB (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet			PVD Coated		Carbide	CBN	Diamond						
	TN60	TC40	TC60	PR630	PR930	KW10	KBN10B	KPD010	GB○○R/L 050～120	GB○○R/L 125～225	GB○○R/L 230～325	GB○○R/L 330～400	GB○○R/L 400～480	
Carbon Steel (SxxC etc.)	☆ 150~220	☆ 150~220	☆ 100~150	☆ 80~180	★ 80~200	-	-	-	①0.03～0.08 ②Traversing N.A. ③Traversing N.A.	①0.04～0.09 ②0.04～0.09 ③Max. 0.3	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.8	Wet Cutting
Alloy Steel (SCM etc.)	☆ 130~200	☆ 130~200	☆ 80~130	☆ 80~160	★ 80~180	-	-	-	①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.8	
Stainless Steel (SUS304 etc.)	☆ 70~150	-	☆ 60~100	☆ 60~130	★ 60~150	-	-	-	①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	①0.04～0.08 ②0.04～0.08 ③Max. 0.3	①0.05～0.09 ②0.05～0.09 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.1 ②0.05～0.1 ③Max. 0.8	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	★ 60~100	★ 150~400	-	①0.03～0.08 ②Traversing N.A. ③Traversing N.A.	①0.04～0.09 ②0.04～0.09 ③Max. 0.3	①0.05～0.1 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.5	①0.05～0.12 ②0.05～0.1 ③Max. 0.8	
Aluminium	-	-	-	-	-	★ 150~400	-	★ 150~2000	①0.05～0.12 ②Traversing N.A. ③Traversing N.A.	①0.05～0.15 ②0.05～0.15 ③Max. 0.5	①0.05～0.15 ②0.05～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	
Brass	-	-	-	-	-	★ 150~300	-	★ 200~800	①0.05～0.12 ②Traversing N.A. ③Traversing N.A.	①0.05～0.15 ②0.05～0.15 ③Max. 0.5	①0.05～0.15 ②0.05～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	①0.08～0.15 ②0.08～0.15 ③Max. 0.8	

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation ☆ : 2nd Recommendation

Recommended Cutting Conditions

◆ TGF (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)				Remark
	Cermet				PVD Coated		Carbide	Diamond					
	TN60	TN90	TC40	TC60	PR630	PR930	KW10	KPD010 KPD001	TGF32R/L 033～060	TGF32R/L 075～095	TGF32R/L 100～145	TGF32R/L 150～325	
Carbon Steel (SxxC etc.)	☆ 150~220	☆ 150~220	☆ 150~220	☆ 100~150	☆ 80~180	★ 80~200	-	-	①0.01～0.05 ②Traversing N.A. ③Traversing N.A.	①0.02～0.07 ②Traversing N.A. ③Traversing N.A.	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	Wet Cutting
Alloy Steel (SCM etc.)	☆ 130~200	☆ 130~200	☆ 130~200	☆ 80~130	☆ 80~160	★ 80~180	-	-	①0.01～0.04 ②Traversing N.A. ③Traversing N.A.	①0.02～0.06 ②Traversing N.A. ③Traversing N.A.	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	
Stainless Steel (SUS304 etc.)	☆ 70~150	☆ 70~150	-	☆ 60~100	☆ 60~130	★ 60~150	-	-	①0.01～0.04 ②Traversing N.A. ③Traversing N.A.	①0.02～0.06 ②Traversing N.A. ③Traversing N.A.	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	-	★ 60~100	-	①0.01～0.05 ②Traversing N.A. ③Traversing N.A.	①0.02～0.07 ②Traversing N.A. ③Traversing N.A.	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	
Aluminium	-	-	-	-	-	-	★ 150~400	★ 150~2000	①0.01～0.05 ②Traversing N.A. ③Traversing N.A.	①0.02～0.07 ②Traversing N.A. ③Traversing N.A.	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	①0.03～0.08 ②0.03～0.06 ③Max. 0.2	
Brass	-	-	-	-	-	-	★ 150~300	★ 200~800	①0.01～0.04 ②Traversing N.A. ③Traversing N.A.	①0.02～0.06 ②Traversing N.A. ③Traversing N.A.	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	①0.03～0.07 ②0.02～0.05 ③Max. 0.2	

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ TG (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								f (mm/rev)					Remark
	Cermet			PVD Coated		Carbide	Carbide	Diamond						
	TN60	TC40	TC60	PR630	PR930	KW10	KBN10B	KPD010	TG○○R/L 075～095	TG○○R/L 125～200	TG○○R/L 230～300	TG○○R/L 330～400	TG○○R/L 430～450	
Carbon Steel (SxxC etc.)	★ 150~220	-	-	-	-	-	-	-	0.03～0.07	0.03～0.08	0.05～0.1	0.05～0.12	0.05～0.12	Wet Cutting
Alloy Steel (SCM etc.)	★ 130~200	-	-	-	-	-	-	-	0.02～0.06	0.03～0.07	0.05～0.09	0.05～0.1	0.05～0.1	

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ GH (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)				Remark
	Cermet			PVD Coated		Carbide	Ceramic						
	TN90	TC40	TC60	PR630	PR930	KW10	A65	A66N	GH 40～50	GH 55～70	GH 75～80	GH 100～120	
Carbon Steel (SxxC etc.)	☆ 150~220	☆ 150~220	☆ 100~150	☆ 80~180	★ 80~200	-	-	-	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.1～0.25 ②0.1～0.2 ③Max. 1.5	①0.15～0.3 ②0.15～0.25 ③Max. 2.0	Wet Cutting
Alloy Steel (SCM etc.)	☆ 130~200	☆ 130~200	☆ 80~130	☆ 80~160	★ 80~180	-	-	-	①0.07～0.18 ②0.07～0.13 ③Max. 1.0	①0.07～0.18 ②0.07～0.13 ③Max. 1.0	①0.1～0.23 ②0.1～0.18 ③Max. 1.5	①0.15～0.27 ②0.15～0.22 ③Max. 2.0	
Stainless Steel (SUS304 etc.)	☆ 70~150	-	☆ 60~100	☆ 60~130	★ 60~150	-	-	-	①0.07～0.16 ②0.07～0.13 ③Max. 1.0	①0.07～0.16 ②0.07～0.13 ③Max. 1.0	①0.1～0.21 ②0.1～0.18 ③Max. 1.5	①0.15～0.25 ②0.15～0.22 ③Max. 2.0	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	★ 60~100	☆ 150~300	☆ 150~300	KW10 ①0.07～0.2 ②0.07～0.15 ③Max. 1.0 A65/A66N ①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	KW10 ①0.07～0.2 ②0.07～0.15 ③Max. 1.0 A65/A66N ①0.03～0.07 ②Traversing N.A. ③Traversing N.A.	KW10 ①0.1～0.25 ②0.1～0.2 ③Max. 1.5 A65/A66N ①0.05～0.09 ②Traversing N.A. ③Traversing N.A.	KW10 ①0.15～0.3 ②0.15～0.25 ③Max. 2.0 A65/A66N ①0.05～0.09 ②Traversing N.A. ③Traversing N.A.	
Aluminium	-	-	-	-	-	★ 150~400	-	-	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.1～0.25 ②0.1～0.2 ③Max. 1.5	①0.15～0.3 ②0.15～0.25 ③Max. 2.0	
Brass	-	-	-	-	-	★ 150~300	-	-	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.07～0.2 ②0.07～0.15 ③Max. 1.0	①0.1～0.25 ②0.1～0.2 ③Max. 1.5	①0.15～0.3 ②0.15～0.25 ③Max. 2.0	
High Hard Mat'l	-	-	-	-	-	-	☆ 40~80	☆ 40~80	①0.02～0.05 ②Traversing N.A. ③Traversing N.A.	①0.02～0.05 ②Traversing N.A. ③Traversing N.A.	①0.02～0.05 ②Traversing N.A. ③Traversing N.A.	-	

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ GHU (3-D Chipbreaker)

Work Material	Recommended Insert Grade (V_c m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet			CVD Coated	PVD Coated		Ceramic							
	TN60	TC40	TC60	CR9025	PR630	PR930	A65	A66N	GHU 40	GHU 50	GHU 60			
Carbon Steel (SxxC etc.)	☆ 130~200	-	-	☆ 80~180	-	-	-	-	①0.06～0.12 ②0.05～0.1 ③Max. 1.0	①0.06～0.12 ②0.05～0.1 ③Max. 1.0	①0.06～0.15 ②0.05～0.12 ③Max. 1.5			Wet Cutting
Alloy Steel (SCM etc.)	☆ 100~180	-	-	☆ 80~160	-	-	-	-	①0.06～0.12 ②0.05～0.1 ③Max. 1.0	①0.06～0.12 ②0.05～0.1 ③Max. 1.0	①0.06～0.15 ②0.05～0.12 ③Max. 1.5			
Stainless Steel (SUS304 etc.)	-	-	-	☆ 60~130	-	-	-	-	①0.06～0.1 ②0.05～0.08 ③Max. 0.8	①0.06～0.1 ②0.05～0.08 ③Max. 0.8	①0.06～0.12 ②0.05～0.1 ③Max. 1.2			

※Above cutting conditions are for external grooving.
Set 10% lower speed and feed rate for internal grooving.

★ : 1st Recommendation ☆ : 2nd Recommendation

Recommended Cutting Conditions

◆ GA (3-D Chipbreaker)

Work Material	Recommended Insert Grade (V_C m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet				CVD Coated	PVD Coated		Carbide						
	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10	GA 30	GA 40	GA 50			
Carbon Steel (SxxC etc.)	☆ 130~200	-	-	-	☆ 80~180	-	-	-	①0.06~0.18 ②0.05~0.15 ③Max. 0.8	①0.06~0.21 ②0.05~0.17 ③Max. 1.0	①0.06~0.25 ②0.05~0.2 ③Max. 1.3			Wet Cutting
Alloy Steel (SCM etc.)	☆ 100~180	-	-	-	☆ 80~160	-	-	-	①0.06~0.15 ②0.05~0.12 ③Max. 0.3	①0.06~0.18 ②0.05~0.15 ③Max. 0.5	①0.06~0.22 ②0.05~0.18 ③Max. 0.8			
Stainless Steel (SUS304 etc.)	-	-	-	-	☆ 60~130	-	-	-	①0.06~0.1 ②0.05~0.08 ③Max. 0.8	①0.06~0.1 ②0.05~0.08 ③Max. 0.8	①0.06~0.12 ②0.05~0.1 ③Max. 1.2			

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ GIA (3-D Chipbreaker)

Work Material	Recommended Insert Grade (V_C m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet				CVD Coated	PVD Coated		Carbide						
	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10	GIA 30	GIA 40	GIA 50			
Carbon Steel (SxxC etc.)	☆ 60~120	-	-	-	☆ 60~120	-	-	-	①0.04~0.08 ②0.02~0.08 ③Max. 0.3	①0.04~0.09 ②0.02~0.08 ③Max. 0.4	①0.05~0.1 ②0.05~0.08 ③Max. 0.5			Wet Cutting
Alloy Steel (SCM etc.)	☆ 60~100	-	-	-	☆ 60~100	-	-	-	①0.04~0.07 ②0.02~0.07 ③Max. 0.3	①0.04~0.07 ②0.02~0.07 ③Max. 0.4	①0.05~0.08 ②0.05~0.08 ③Max. 0.5			
Stainless Steel (SUS304 etc.)	-	-	-	-	☆ 60~80	-	-	-	①0.04~0.07 ②0.02~0.07 ③Max. 0.3	①0.04~0.07 ②0.02~0.07 ③Max. 0.4	①0.05~0.08 ②0.05~0.08 ③Max. 0.5			

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ GV (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_C m/min)						①f Rate at Grooving (mm/rev) ②f Rate at Traversing (mm/rev) ③*ap* at Traversing (mm)						Remark
	Cermet			PVD Coated		Carbide	GVR/L 100SS~300SS 100S~300S	GVR/L 145B~185B	GVR/L 200B~280B	GVR/L 300B~400B			
	TN90	TC40	TC60	PR630	PR930	KW10	GVR/L 100A~340A 100AR~150AR	-	GVR/L 100BR	GVR/L 150BR	GVR/L 280C~325C	GVR/L 340C~425C	GVR/L 430C~500C	
Carbon Steel (SxxC etc.)	☆ 120~180	☆ 120~180	☆ 80~120	☆ 80~140	★ 80~160	-	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	Wet Cutting
Alloy Steel (SCM etc.)	☆ 100~160	☆ 100~160	☆ 80~100	☆ 80~120	★ 80~140	-	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	
Stainless Steel (SUS304 etc.)	☆ 70~130	-	☆ 60~100	☆ 60~110	★ 60~130	-	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	★ 60~100	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	
Aluminium	-	-	-	-	-	★ 150~300	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	
Brass	-	-	-	-	-	★ 100~250	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	

※Traversing is not available for Insert of Edge Width 1mm (GVR/L100SS, GVFR/L100S, GVR/L100A)

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ GVF (Ground Chipbreaker)

Work Material	Recommended Insert Grade (V_C m/min)								①f at Grooving (mm/rev) ②f at Traversing (mm/rev) ③*ap* at Traversing (mm)					Remark
	Cermet				CVD Coated	PVD Coated		Carbide	GVFR/L 200A~340A	GVFR/L 250B~350B	GVFR/L 400B~490B	GVFR/L 350C~450C	GVFR/L 500C~600C	
	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10	GVFR/L 100AR~150AR	GVFR/L 150BR	GVFR/L 200BR	-	-	
Carbon Steel (SxxC etc.)	-	☆ 150~220	☆ 150~220	☆ 100~150	-	☆ 80~180	★ 80~200	-	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.8	Wet Cutting
Alloy Steel (SCM etc.)	-	☆ 130~200	☆ 130~200	☆ 80~130	-	☆ 80~160	★ 80~180	-	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.09 ②0.05~0.09 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.8	
Stainless Steel (SUS304 etc.)	-	☆ 70~150	-	☆ 60~100	-	☆ 60~130	★ 60~150	-	①0.03~0.07 ②0.03~0.1 ③Max. 0.3	①0.04~0.08 ②0.04~0.08 ③Max. 0.3	①0.05~0.09 ②0.05~0.09 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.1 ②0.05~0.1 ③Max. 0.8	
Cast Iron (FC · FCD etc.)	-	-	-	-	-	-	-	★ 60~100	①0.03~0.08 ②0.03~0.08 ③Max. 0.3	①0.04~0.09 ②0.04~0.09 ③Max. 0.3	①0.05~0.1 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.5	①0.05~0.12 ②0.05~0.1 ③Max. 0.8	
Aluminium	-	-	-	-	-	-	-	★ 150~400	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	
Brass	-	-	-	-	-	-	-	★ 150~300	①0.05~0.12 ②0.05~0.12 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.5	①0.05~0.15 ②0.05~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	①0.08~0.15 ②0.08~0.15 ③Max. 0.8	

· Apply sufficient coolant
· If the excellent Surface Finish is needed at Traversing, make *ap* under 0.5mm

★ : 1st Recommendation ☆ : 2nd Recommendation

Recommended Cutting Conditions CERACUT Plunge & Turn

■ GMG · GMM · GMN · GMGA

Work Material	Recommended Insert Grade (V_C m/min)					Grooving				Traversing				Remark
	Cermet	CVD Coated	PVD Coated		Carbide	Width (mm)				Width (mm)				
	TN90	CR9025	PR915	PR930	KW10	2.0~3.0	4.0	5.0	6.0/8.0	2.0~3.0	4.0	5.0	6.0/8.0	
						f (mm/rev)				f (mm/rev)				
Carbon Steel (SxxC etc.)	☆ 100~220	☆ 80~200	★ 80~200	☆ 80~200	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	Wet Cutting
Alloy Steel (SCM etc.)	☆ 80~200	☆ 70~180	★ 70~180	☆ 70~180	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	
Stainless Steel (SUS304 etc.)	☆ 70~160	☆ 60~150	★ 60~150	☆ 60~150	-	0.05~0.15	0.10~0.20	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.25	0.20~0.40	0.25~0.40	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 70~150	0.05~0.20	0.10~0.30	0.15~0.40	0.20~0.40	0.10~0.25	0.15~0.35	0.20~0.45	0.25~0.45	
Aluminium	-	-	-	-	★ 200~500	0.05~0.20	0.08~0.25	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	
Brass	-	-	-	-	★ 100~200	0.05~0.15	0.08~0.20	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	

★ : 1st Recommendation · ☆ : 2nd Recommendation

◆ Regarding the Traversing, See the Conditions below.

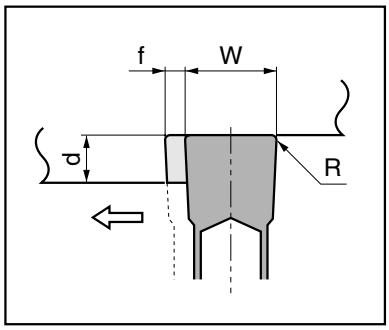
① KGM Toolholder

	Recommended Conditions	
ap d(MAX)mm	under 80% of Edge Width	· ap≦0.8w
f(MAX)mm	under 10% of Edge Width	· f≦0.1w

(ap) × (f) shall not exceed 1/2 of d(Max) × f(Max)

Load(mm^2) \ Edge Width(mm)	2.0~2.5	3.0	4.0	5.0	6.0	8.0
ap×f (ap)×(f)	≦0.20	≦0.36	≦0.64	≦1.00	≦1.44	≦2.56

· ap×f≦$\frac{1}{2}$×0.8w×0.1w=0.04w^2



② KGM-T Toolholder (Deep Grooving type)
Use the Conditions less than 90% of KGM.

③ KGMM · KGMS Toolholder

	Recommended Conditions	
ap d(MAX)mm	under 50% of Edge Width	· ap≦0.5w
f(MAX)mm	under 4% of Edge Width	· f≦0.04w

(ap) × (f) shall be settled as follows. (Under 50% of KGM)

Load(mm^2) \ Edge Width(mm)	2.0~2.5	3.0	4.0	5.0	6.0
ap×f (ap.)×(f)	≦0.10	≦0.18	≦0.32	≦0.50	≦0.72

· ap×f≦0.02w^2

③ KIGM Toolholder

	Recommended Conditions	
ap d(MAX)mm	under 70% of Edge Width	· ap≦0.7w
f(MAX)mm	under 8% of Edge Width	· f≦0.08w

(ap)×(f) shall be settled as follows. (Under 70% of KGM)

Load(mm^2) \ Edge Width(mm)	3.0	4.0	5.0
ap×f (ap)×(f)	≦0.25	≦0.44	≦0.70

· ap×f≦0.04w^2

Recommended Cutting Conditions CERACUT Plunge & Turn

■ GMG/GMM/GMGA 8030 (Face Grooving)

Work Material	Recommended Insert Grade (V_c m/min)					Face Grooving Width (mm)				Traversing Width (mm)				Remark
	Cermet	CVD Coated	PVD Coated		Carbide									
	TN90	CR9025	PR915	PR930	KW10	8.0				8.0				
						f (mm/rev)				f (mm/rev)				
Carbon Steel (SxxC etc.)	☆ 100~220	☆ 80~160	★ 80~160	☆ 80~160	-	0.10~0.2				0.10~0.25				Wet Cutting
Alloy Steel (SCM etc.)	☆ 80~160	☆ 70~160	★ 70~160	☆ 70~160	-	0.10~0.2				0.10~0.25				
Stainless Steel (SUS304 etc.)	☆ 70~140	☆ 60~130	★ 60~130	☆ 60~130	-	0.10~0.2				0.10~0.25				
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 70~130	0.10~0.3				0.10~0.35				
Aluminium	-	-	-	-	★ 200~300	0.08~0.25				0.08~0.30				
Brass	-	-	-	-	★ 100~150	0.08~0.25				0.08~0.30				

★ : 1st Recommendation ☆ : 2nd Recommendation

■ FMM · FMN

Work Material	Recommended Insert Grade (V_c m/min)					Face Grooving(FMM · FMN) Width (mm)				Traversing (FMM) Width (mm)				Remark
	Cermet	CVD Coated	PVD Coated		Carbide									
	TN90	CR9025	PR915	PR930	KW10	2.0	3.0	4.0	5.0/6.0	2.0	3.0	4.0	5.0/6.0	
						f (mm/rev)				f (mm/rev)				
Carbon Steel (SxxC etc.)	☆ 100~220	☆ 80~200	☆ 80~200	★ 80~200	-	0.01~0.03	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	Wet Cutting
Alloy Steel (SCM etc.)	☆ 80~200	☆ 70~180	☆ 70~180	★ 70~180	-	0.01~0.03	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	
Stainless Steel (SUS304 etc.)	☆ 70~160	☆ 60~150	☆ 60~150	★ 60~150	-	0.01~0.03	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 70~150	0.01~0.03	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	
Aluminium	-	-	-	-	★ 200~500	0.01~0.05	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	
Brass	-	-	-	-	★ 100~200	0.01~0.05	0.03~0.05	0.03~0.08	0.05~0.10	Not Recommended	0.05~0.10	0.05~0.25	0.10~0.30	

· At the first use, make the Feed Rate 1/100 of Edge Width and check the Chip's Evacuation.
· FMM type Inserts are only for Deep Grooving and not available to traversing.

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ Regarding the Traversing, See the Conditions below.

ap & f of FMM type

	Recommended Conditions	
ap d(MAX)mm	under 50% of Edge Width	· ap≦0.5w
f(MAX)mm	under 3~5% of Edge Width	· f≦〔0.03(MIN.)~0.05(MAX.)〕w

(ap)×(f) shall be settled as follows.

Load(mm^2) \ Edge Width(mm)	3.0	4.0	5.0	6.0
ap×f (ap)×(f)	≦0.09	≦0.14	≦0.25	≦0.36

· ap×f≦0.02w^2

■ FTK

Work Material	Recommended Insert Grade (V_c m/min)					Width (mm)					Remark
	Cermet	CVD Coated	PVD Coated		Carbide	4.0	5.0				
	TN90	CR9025	PR660	PR930	KW10	f (mm/rev)					
Carbon Steel (SXXC etc.)	☆ 120~200	★ 80~180	☆ 60~130	☆ 60~130	–	0.05~0.15	0.05~0.15				Wet Cutting
Alloy Steel (SCM etc.)	☆ 100~160	★ 70~150	☆ 60~130	☆ 60~130	–	0.05~0.15	0.05~0.15				
Stainless Steel (SUS304 etc.)	☆ 80~150	☆ 60~140	★ 50~120	☆ 50~120	–	0.05~0.15	0.05~0.15				
Cast Iron (FC · FCD etc.)	–	–	–	–	★ 50~100	0.10~0.3	0.10~0.3				
Aluminium	–	–	–	–	★ 200~450	0.05~0.25	0.05~0.25				
Brass	–	–	–	–	★ 100~200	0.05~0.25	0.05~0.25				

★ : 1st Recommendation ☆ : 2nd Recommendation

■ Guide for External Grooving

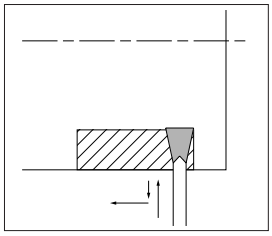
● Point (I) (Traversing after Grooving)

① Grooving Depth Over 0.5mm: At Roughing (See Fig. 1)

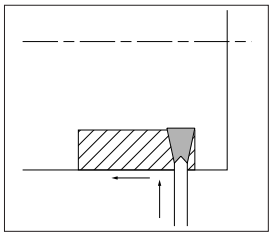
Before traversing, pull the tool back for about 0.1mm once after grooving, instead of traversing subsequent to grooving.
(It will make the load to the cutting edge to one direction only.)

② Grooving Depth under 0.5mm: At Finishing (See Fig. 2)

Traversing subsequent to grooving is available, because the load to the cutting edge is small.
(Dwell-motion is not necessary, either.)



Before traversing, pull the tool back for about 0.1mm once after grooving
(Groove Depth over 0.5mm: At Roughing)
Fig. 1



Traversing subsequent to grooving
(Groove Depth under 0.5mm: At Finishing)
Fig. 2

● Point (II)

When widening the groove width, apply the "Step Turning" as shown in Fig. 3. Lastly the widened groove and side walls should be finished.
(For the better chip control, a*p* over 0.5mm is recommended.)

Note: When the work is not supported by the center, lower the feed rate of the plunging toward the center.

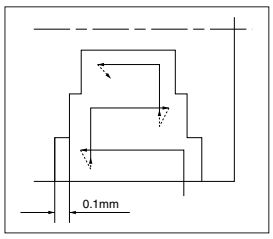


Fig. 3

■ Guide for Face Grooving

〈Toolholder Selection〉

① Pick up the available items from the groove width. Machining Dia. ϕD listed in the catalog means the dimension that the initial plunge of face grooving is available as shown in Fig. 1

② Confirm Grooving Depth (T dimension)

③ Toolholder's hand is recommended so as to be mounted reversely, because of chip's smooth flow and drop. (See Fig. 2.)

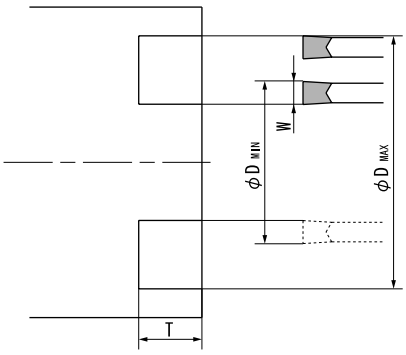


Fig. 1

〈Advice to Traversing〉

Traversing direction shall be from outer dia. to inner dia. as shown in Fig. 3. It makes chip evacuation better.

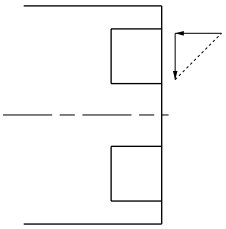


Fig. 3

Toolholder	R-hand	Toolholder	L-hand
Insert	(No Hand)	Insert	(No Hand)

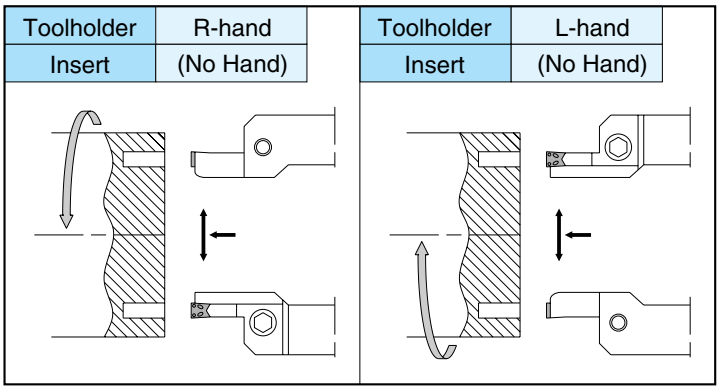


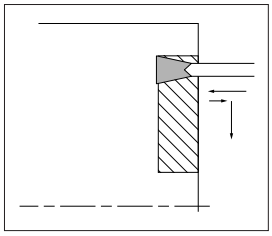
Fig. 2 Toolholder's Hand and Rotation

■ Guide for Face Grooving (Continued)

● Point (I) (Traversing after Grooving)

① Grooving Depth Over 0.5mm: At Roughing (See Fig.4)

Before traversing, pull the tool back for about 0.1mm once after grooving, instead of traversing subsequent to grooving.
(It will make the load to the cutting edge to one direction only.)

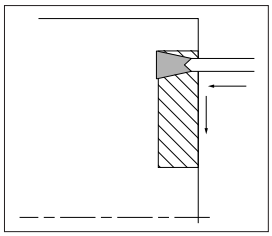


Before traversing, pull the tool back for about 0.1mm once after grooving
(Groove Depth over 0.5mm: At Roughing)

Fig. 4

② Grooving Depth under 0.5mm: At Finishing (See Fig. 5)

Traversing subsequent to grooving is available, because the load to the cutting edge is small.
(Dwell-motion is not necessary, either.)



Traversing subsequent to grooving
(Groove Depth under 0.5mm: At Finishing)

Fig. 5

● Point (II)

When widening the grooving width, apply the "Step Turning" as shown in Fig. 6. Lastly the widened groove and side walls should be finished.
(For the better chip control, a*p* over 0.5mm is recommended.)

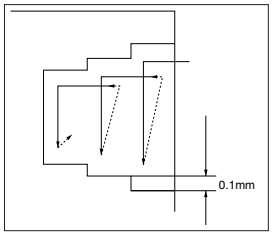
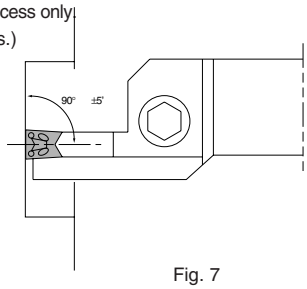


Fig. 6

● Trouble Shooting

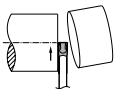
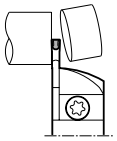
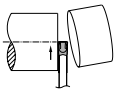
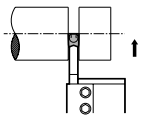
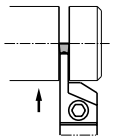
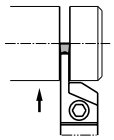
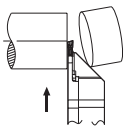
Trouble	Countermeasure
Whitish trace remains at the groove bottom.	① Increase cutting speed at finishing process only. (This trouble is solved in most cases.) If this method is not successful, try ② as follows. ② Check the insert edge's parallelness. [Adjustment: Apply the insert edge to the work face and adjust the toolholder within the angle of ±5'. (See Fig. 7)]  Fig. 7
Chips are entangled.	① Apply the toolholder's reverse mounting. Adjust the coolant flow to the cutting edge. ② When widening the groove, do not operate the deep grooving at one time, but repeat the shallow grooving and turning.
Insert cracks at traversing.	Reverse the facing direction.
Groove is not straight.	Check the edge's parallelness. Decrease the feed rate.

Cutting-Off

267～284

Product Lineup

■ Product Lineup

CERACUT Cut-Off (1-Corner Use)	Toolholder type (Long Shank for Automatic Lathe) Cutting Dia. ϕ26～ϕ45	**KTKH-S** (P.272)  Width: 1.6～3.1mm		Toolholder type (Long Shank for Automatic Lathe) Bolt Clamp Cutting Dia. ϕ10～ϕ32	**KTKH-B** (P.277)  Width: 1.6～3.1mm
	Toolholder type Cutting Dia. ϕ30～ϕ79	**KTKH-S** (P.272)  Width: 2.2～5.1mm			
	Blade type Cutting Dia. ϕ32～ϕ120	**KTKB-S(S)** (P.274)  Width: 1.6～9.6mm			
CERACUT Plunge & Turn (2-Corner Use)	KGM Tool Cutting Dia. ϕ10～ϕ32	**KGM** (P.278)  Width: 1.5～4.0mm	**KGM-T** (P.279)  Width: 2.0～6.0mm		
	KGM Tool (Back Clamp) Cutting Dia. ϕ10～ϕ20	**KGMB** (P.282)  Width: 1.5～2.0mm			

■ Cutting-Off Tools

Series Name	Shape	Advantage	Application
CERACUT Cut-Off		1) Self-Clamping System Hit the Insert lightly by a plastic hammer and push it in. 2) 1-Corner Use Insert 3) 3-D Chipbreaker · No Indication (ex. TKN3) · P-Chipbreaker (ex. TKN3-P) 4) Blade type and Integral Shank type 5) Max. Cutting Dia. 120mm	1) For Cutting-Off and Deep Grooving 2) No Indication chipbreaker is for general cutting-off application (Feed Rate: 0.1～0.2mm/rev)  3) P-Chipbreaker is for cutting-off at low feed rate. (Feed rate: 0.03～0.08mm/rev) 
CERACUT KGM Tool		1) Insert is clamped from top side. 2) 2-Corner Use & 1-Corner Use Insert 3) 3-D Chipbreaker & No Chipbreaker Insert 4) -TK type···Smaller Corner-R, 0.0, 0.05mm -MT type···Larger Corner-R, 0.2-0.3mm 5) Max. Cutting Dia. 32mm	1) For Cutting-Off and Grooving of small work 2) For Automatic Lathe, Small Machine
CERACUT KGMB Tool		1) Insert clamping from back side is available. 2) 2-Corner Use Insert 3) 3-D Chipbreaker (No Indication) 4) Sharp Corner 5) Max. Cutting Dia. 20mm	1) For Cutting-Off and Grooving of small work 2) For Automatic Lathe (Gang-type Toolpost) 

Guide for Cutting-Off

■ Tool Selection

		CERACUT Cut-Off	CERACUT Plunge & Turn
Insert	1. Insert's Corner 1-Corner Insert···For Larger Dia. Workpiece: Max. 120mm	○	–
	2-Corner Insert···For Smaller Dia. Workpiece: Max. 32mm Cost per Corner is Reduced and Economical	–	○
	2. Use No Lead Angle Insert, If there is no limit to finished shape	TKN	GMMB GMM
	3. Use Lead Angled Insert to cope with the remaining boss.	TK R/L (➡Fig.1)	GMMB-R/L GMM-R/L (➡Fig.2)
	4. Use Sharp-cornered lead-angled Insert to make the remaining boss much smaller at the machining of small part and thin part.	–	GMMB-R/L GMM-R/L (➡Fig.2)
	5. Use Minimun Width Insert suitable for the Machining	○	○
Tool holder	1. Use Suitable Toolholder (Blade) for the Workpiece Dia.	○	○
	2. Use More Rigid Toolholder (Blade).	○	○
	3. Use Back Clamp Toolholder, If there is no space for Clamping Tools from top side at Automatic Lathe or so.	–	KGMB

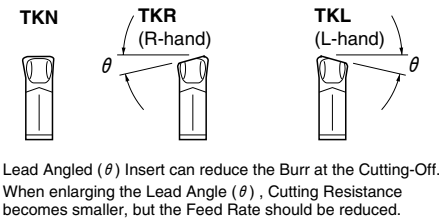
■ How to Set Up

1. Hit the Insert lightly by a Plastic Hammer and push it in to the extent that it is not removed by Fingers.	○ (➡Fig.3)	–
2. Remove the insert by using the wrench.	○ (➡Fig.4)	

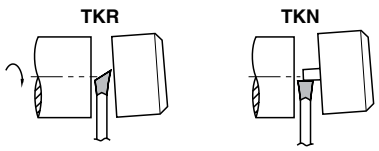
■ Cutting Off

1. Set the Edge Height 0.1-0.2mm above the Center Height.	○	○
2. Always Wet Cutting and Sufficient Coolant to the Cutting Edge	○	○
3. Constant Spindle Revolution is recommended to obtain stable Tool Life.	○	○
4. Cut off at the Position to the Chuck as close as possible.	○	○
5. Decrease the Feed Rate to 1/2 to 1/3 near the Center to prevent the Shock.	○	○
● Overuse of Insert and Toolholder (Blade) may cause Insert's Breakage and Toolholder's (Blade's) Damage. ● Do not rework the Insert and Toolholder (Blade) or They may break. ● Clean the Insert Pocket well by Air Blow, When replacing Insert.	○	○

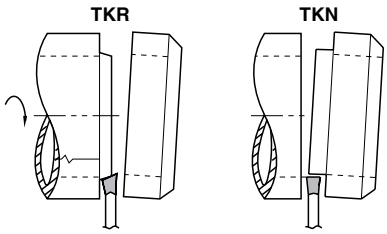
○ : Corresponding –: Not Corresponding



· Lead Angled (θ) Insert can reduce the Burr at the Cutting-Off.
· When enlarging the Lead Angle (θ), Cutting Resistance becomes smaller, but the Feed Rate should be reduced.



Case of Solid Work



Case of Hollow Work (Pipe)

Fig. 1

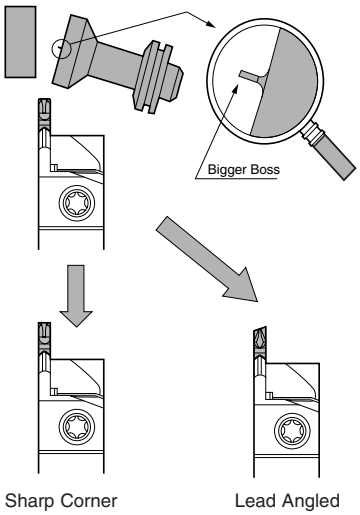


Fig. 2

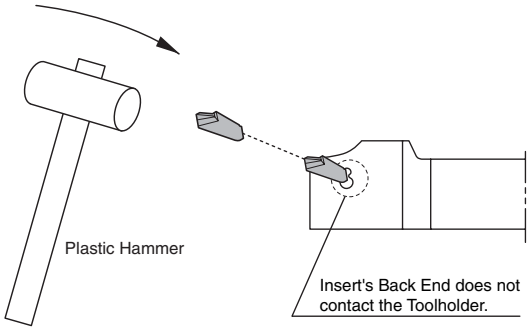


Fig. 3

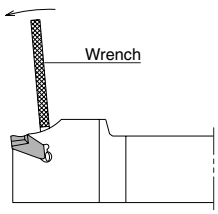
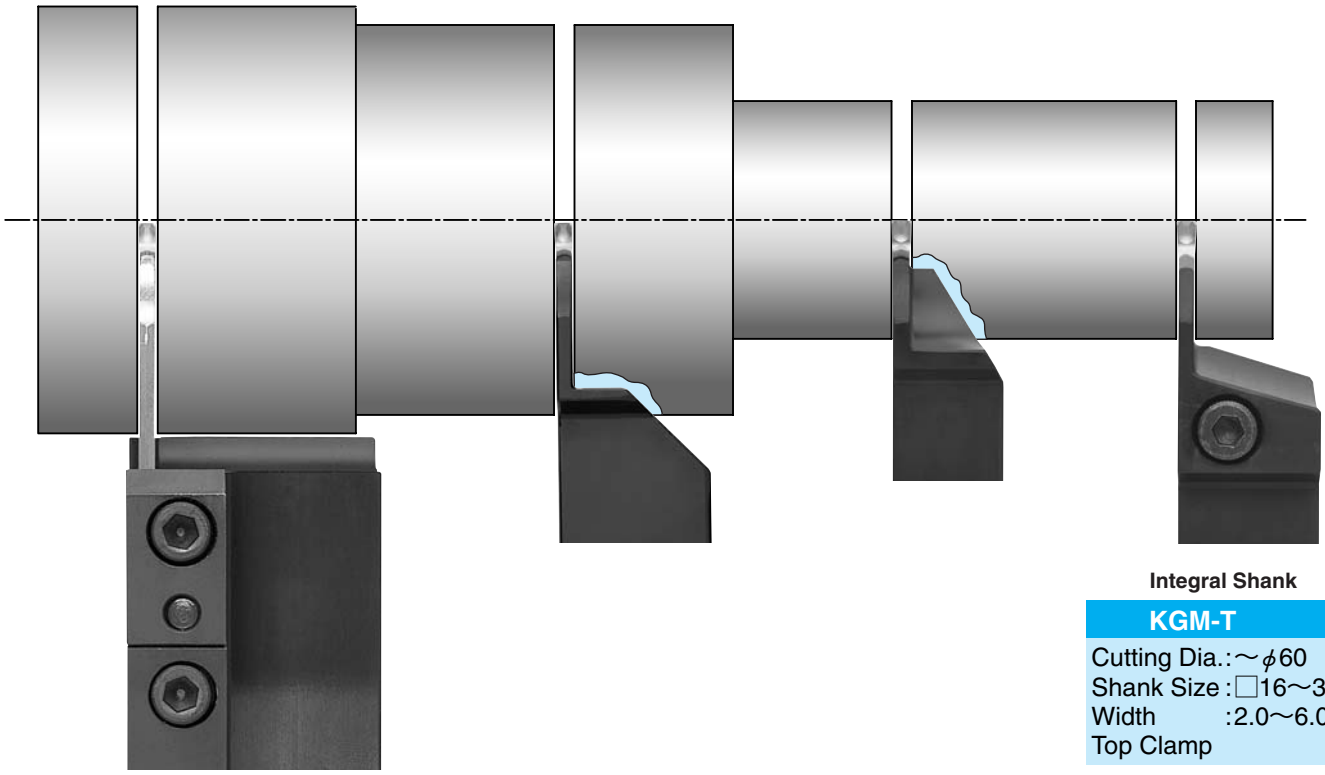


Fig. 4

Summary of Cutting-Off

■ General Cutting-Off ～φ120



Integral Shank

KGM-T

Cutting Dia.:～φ60
Shank Size :□16～32
Width :2.0～6.0
Top Clamp

P.279

Blade + Toolblock

KTKB

Cutting Dia.:～φ120
Shank Size :□16～32
Width :1.6～9.6
Self Clamp

P.274～6

Integral Shank

KTKH

Cutting Dia.:～φ79
Shank Size :□20～25
Width :3.1～5.1
Self Clamp

P.272

Integral Shank

KTKH

Cutting Dia.:～φ41
Shank Size :□10～20
Width :2.2～3.1
Self Clamp

P.272

2-Corner Use

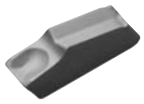
Chipbreaker for Sharp Cutting

2-Corner Use

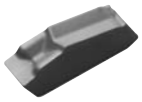
Chipbreaker for Stability

1-Corner Use

Chipbreaker for Stability



Chipbreaker for General Cut-Off

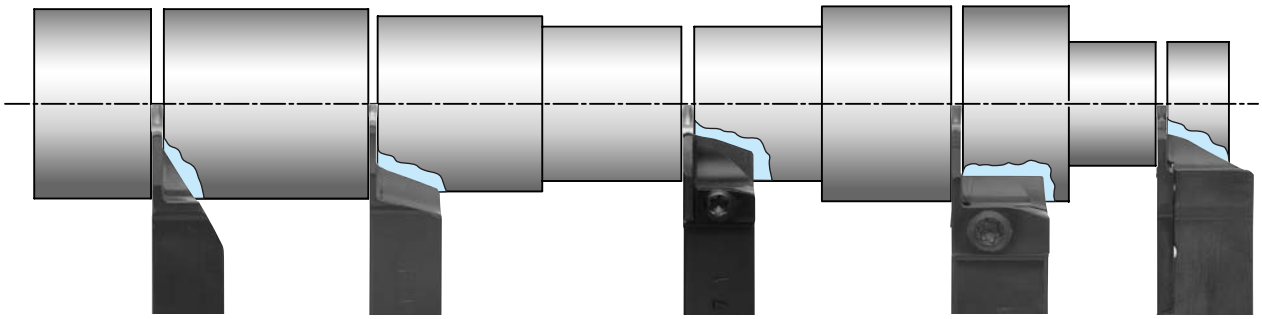


Chipbreaker for Low Feed Cut-Off

Blade + Toolblock	Integral Shank	
		
CERACUT Cut-Off	CERACUT Cut-Off	CERACUT Plunge & Turn

■ Small Dia.Parts Cutting-Off ～φ45

Small Shank



KTKH	KTKH	KTKH-B	KGM	KGMB
Cutting Dia.:～φ45 Shank Size :□10～16 Width :2.2～3.1 Self Clamp	Cutting Dia.:～φ35 Shank Size :□8～14 Width :1.6 Self Clamp	Cutting Dia.:～φ32 Shank Size :□8～16 Width :1.6～3.1 Top Clamp	Cutting Dia.:～φ32 Shank Size :□8～16 Width :1.5～4.0 Top Clamp	Cutting Dia.:～φ20 Shank Size :□8～16 Width :1.5～2.0 Back Clamp
P.272	P.272	P.277	P.278	P.282

Chipbreaker for General Cut-Off

Chipbreaker for Low Feed Cut-Off

Chipbreaker Edge Shape	CERACUT Cut-Off		
	General Cut-Off		Low Feed Cut-Off
	Chamfer + R-honing	Sharp Edge	Chamfer + R-honing
			

2-Corner Use

Chipbreaker for Sharp Cutting

2-Corner Use

Chipbreaker for Stability

1-Corner Use

Chipbreaker for Stability

2-Corner Use

Chipbreaker for Low Feed Cut-Off

Chipbreaker Edge Shape	CERACUT Plunge & Turn			
	Sharp Cutting (MT Chipbreaker)		Stable Cutting (TK Chipbreaker)	
	Chamfer + R-honing	Chamfer + R-honing	Chamfer + R-honing	Sharp Edge
	Corner-R 0.05	Sharp Corner	Corner-R 0.2～0.3	Corner-R 0.2～0.3
				

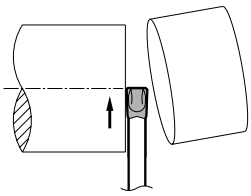
CERACUT Cut-Off
(Self Clamp)

CERACUT Plunge & Turn
(Top Clamp)

CERACUT Plunge & Turn
(Back Clamp)

Cutting-Off Toolholders (Integral Shank)

■ KTKH-S



For Automatic Lathe (Long Shank type)

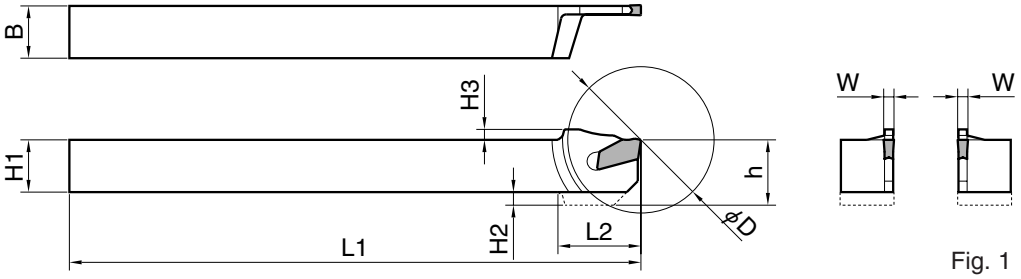


Fig. 1

For Automatic Lathe (Long Shank type)

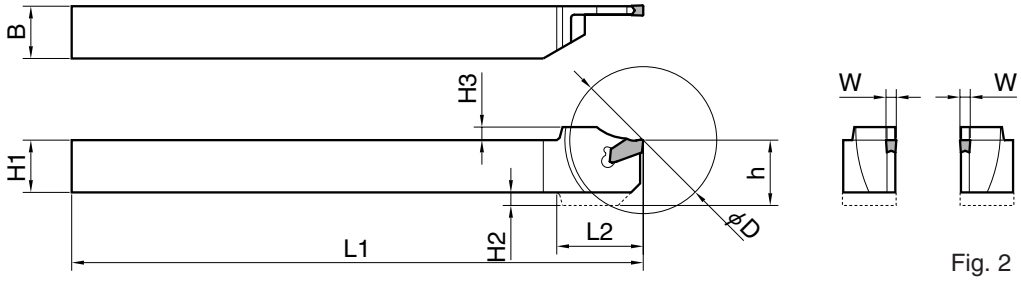


Fig. 2

For General Cutting-Off

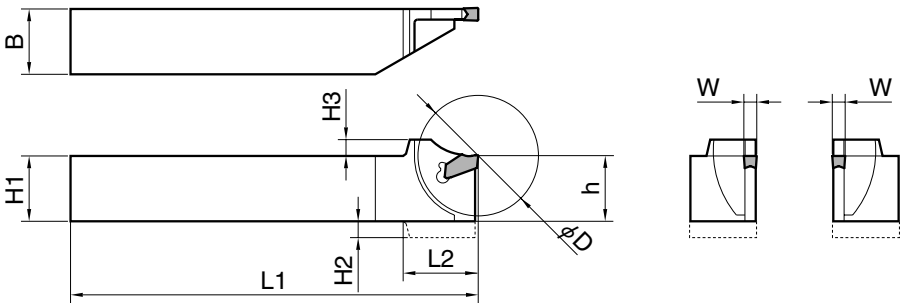


Fig. 3

For General Cutting-Off

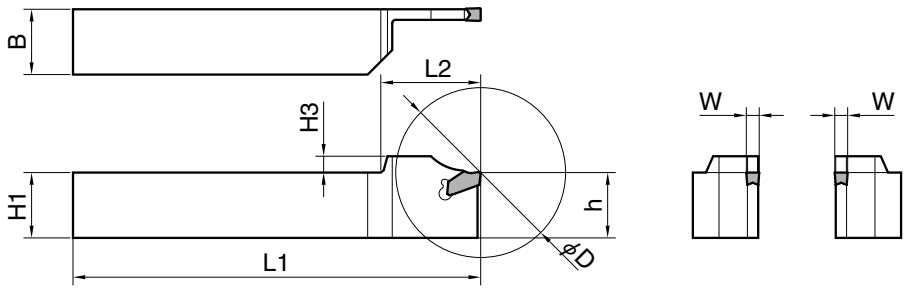


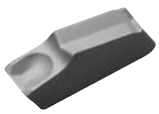
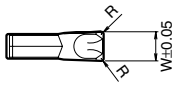
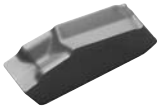
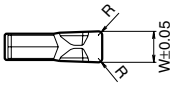
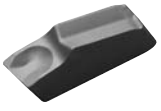
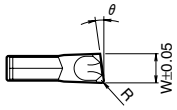
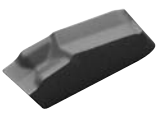
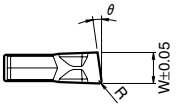
Fig. 4

● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Cutting Dia. φDmax	Dimension (mm) H1=h	H2	H3	B	L1	L2	Width W	Shape	Spare Parts Wrench	Applicable Insert
For Automatic Lathe (Long Shank type)														
KTKH R/L	0808K-1.6-125S	○	○	26	8	4	2	8	125	14.0	1.6	Fig. 1	LTK-5	TKN1.6(-P) TK R/L 1.6(-P)
	1010K-1.6-125S	○	○	28	10	2.5	2	10	125	15.0				
	1212M-1.6-150S	○	○	30	12	0	2	12	150	17.0				
	1414M-1.6-150S	●	○	35	14	0	2	14	150	20.0				
	1010K-2-125S	○	○	30	10	5	3	10	125	17.5	2.2 2.4	Fig. 2	LTK-5	TKN2(-P) TK R/L 2(-P) TKN2.4 TK R/L 2.4
	1212M-2-150S	○	○	30	12	4	3	12	150	18.0				
	1616M-2-150S	○	○	36	16	0	3	16	150	20.7				
	1616M-3-150S	○	○	45	16	4	4	16	150	25.6	3.1	Fig. 2	LTK-5	TKN3(-P),TK R/L 3(-P)
For General Cutting-Off														
KTKH R/L	1010F-2S	○	○	30	10	5	4	10	80	18.6	2.2 2.4	Fig. 3	LTK-5	TKN2(-P) TK R/L 2(-P) TKN2.4 TK R/L 2.4
	1212H-2S	●	●	33	12	4	5	12	100	19.8				
	1612H-2S	●	●	33	16	0	3	12	100	19.8				
	1616H-2S	●	●	33	16	0	3	16	100	19.8				
	2012K-2S	○	○	38	20	0	4	12	125	22.8				
	2020K-2S	○	○	38	20	0	4	20	125	22.8				
	1612H-3S	●	○	36	16	4	4	12	100	21.7	3.1	Fig. 3 Fig. 4	LTK-5	TKN3(-P) TK R/L 3(-P)
	1616H-3S	●	●	36	16	4	4	16	100	21.7				
	2012K-3S	○	○	41	20	0	5	12	125	25.3				
	2020K-3S	●	●	52	20	-	5	20	125	31.0				
	2525M-3S	●	●	55	25	-	5	25	150	31.5				
	2012K-4S	○	○	44	20	0	5	12	125	26.3	4.1	Fig. 3 Fig. 4	LTK-5	TKN4 TK R/L 4
	2020K-4S	●	●	62	20	-	5	20	125	35.0				
	2525M-4S	●	●	68	25	-	5	25	150	38.0				
	2525M-5S	●	○	79	25	-	5	25	150	43.5	4.8,5.1	Fig. 4	LTK-5	TKN4.8,TKN5,TK R/L 5
KTKH R/L	2020K-3T17S	○	○	35	20	0	5	20	125	21.8	3.1	Fig. 3	LTK-5	TKN3(-P) TK R/L 3(-P)
	2525M-3T22S	○	●	45	25	0	5	25	150	26.8				
	2020K-4T22S	○	○	45	20	0	5	20	125	26.8	4.1		LTK-5	TKN4 TK R/L 4
	2525M-4T22S	○	○	45	25	0	5	25	150	26.8				

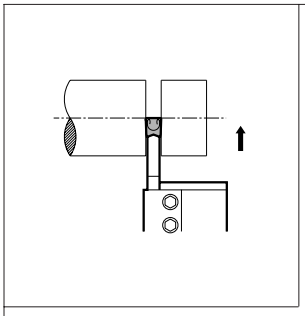
● Applicable Insert

Shape (Handed Insert shows Right-hand)		Description		Dimension (mm) W	Dimension (mm) R	Angle (°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR660	PVD Coated PR930	Carbide KW10
		TKN	1.6	1.6	0.15		○	○	●	○	●
			2	2.2	0.20		●	●	●	●	●
			2.4	2.4	0.20		○	○	●	●	○
			3	3.1	0.25	-	●	●	●	●	●
			4	4.1	0.30		●	●	●	●	●
			4.8	4.8	0.30		-	○	-	-	-
			5	5.1	0.30		-	●	●	○	○
 Low Feed		TKN	1.6-P	1.6	0.15		-	●	○	●	○
			2-P	2.2	0.20	-	○	●	●	○	●
			3-P	3.1	0.25		○	●	●	●	●
 Lead Angled		TK R/L	1.6	1.6	0.15	8°	-	○	●	R	R
			2	2.2	0.20	8°	R	●	○	R	○
			2.4	2.4	0.20	8°	-	○	○	R	R
			3	3.1	0.25	8°	●	●	●	●	R
			3-15D	3.1	0.25	15°	-	●	-	-	-
			4	4.1	0.30	8°	R	●	L	R	○
			5	5.1	0.30	8°	-	R	●	-	○
 Low Feed / Lead Angled		TK R/L	1.6-P	1.6	0.15	8°	-	R	○	●	R
			2-P	2.2	0.20		-	R	●	R	R
			3-P	3.1	0.25		R	●	●	R	R

● : Std. Stock ○ : Check Availability R : R-hand Only

Recommended Cutting Conditions ⇨ P.283

■ KTKB-S / KTKB-SS



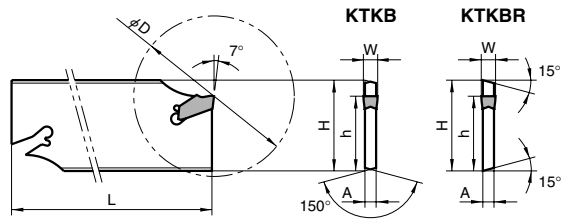


Fig. 1

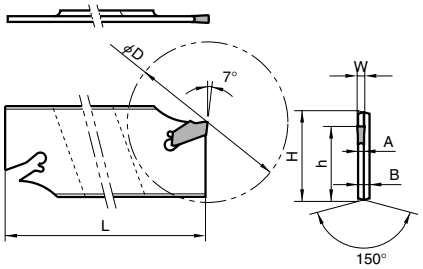


Fig. 2

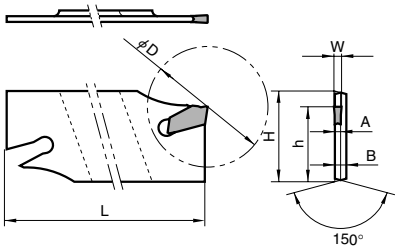


Fig. 3

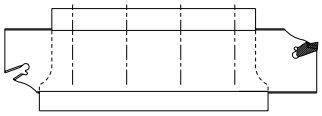
● Blade Dimension

Description		Stock	Cutting Dia.	Dimension (mm)					Width	Shape	Spare Parts Wrench	Applicable Insert	Applicable Toolblock ➡ P.276
			ϕDmax	H	h	B	L	A	W				
KTKB	**19-1SS**	○	35	19	15.7	2.4	86	1.2	1.6	Fig. 3	**LTK-5**	TKN1.6(-P),TKR 1.6(-P)	KTKTB 16-19 20-19
KTKB	**26-1SS**	●	35	26	21.4	2.4	110	1.2	1.6	Fig. 3	**LTK-5**	TKN1.6(-P),TKR 1.6(-P)	KTKTB 16-26 20-26
	26-2SS	○	50	26	21.4	-	110	1.8	2.2,2.4	Fig. 1		TKN2(-P),TKR 2(-P),TKN2.4,TKR 2.4	
	26-3SS	○	75	26	21.4	-	110	2.6	3.1			TKN3(-P),TKR 3(-P)	
KTKB	**32-1SS**	○	35	32	25	2.4	150	1.2	1.6	Fig. 3	**LTK-5**	TKN1.6(-P),TKR 1.6(-P)	KTKTB 20-32 25-32 32-32 KTKTBF 25-32 32-32
	32-3SS	○	100	32	25	-	150	2.6	3.1	Fig. 1		TKN3(-P),TKR 3(-P)	
	32-4SS	○	100	32	25	-	150	3.4	4.1			TKN4,TKR 4	
KTKB	**19-2S**	●	40	19	15.7	-	86	1.8	2.2,2.4	Fig. 1	**LTK-5**	TKN2(-P),TKR 2(-P), TKN2.4,TKR 2.4	KTKTB 16-19 20-19
KTKB	**26-2S**	●	50	26	21.4	-	110	1.8	2.2,2.4	Fig. 1	**LTK-5**	TKN2(-P),TKR 2(-P),TKN2.4,TKR 2.4	KTKTB 16-26 20-26
	26-3S	●	75	26	21.4	-	110	2.6	3.1			TKN3(-P),TKR 3(-P)	
	26-4S	●	80	26	21.4	-	110	3.4	4.1			TKN4,TKR 4	
	26-5S	○	80	26	21.4	-	110	4.2	4.8,5.1			TKN4.8,TKN5,TKR 5	
KTKB	**32-2S**	●	50	32	25	2.4	150	1.8	2.2,2.4	Fig. 2	**LTK-5**	TKN2(-P),TKR 2(-P),TKN2.4,TKR 2.4	KTKTB 20-32 25-32 32-32 KTKTBF 25-32 32-32
	32-3S	●	100	32	25	-	150	2.6	3.1	Fig. 1		TKN3(-P),TKR 3(-P)	
	32-4S	●	100	32	25	-	150	3.4	4.1			TKN4,TKR 4	
	32-5S	●	120	32	25	-	150	4.2	4.8,5.1			TKN4.8,TKN5,TKR 5	
	32-6S	●	120	32	25	-	150	5.4	6.4			TKN6	
KTKBR	**32-8S**	●	120	32	25	-	150	6.8	8.0	Fig. 1	**LTK-5**	TKN8	
	32-9S	●	120	32	25	-	150	8.0	9.6			TKN9	

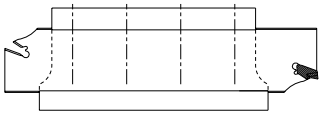
· Suffix "-SS" means Silver Coat Spec. (Prevents Wear by Chips and maintains High Rust-Proof)

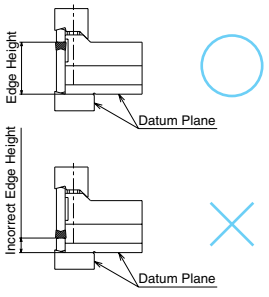
◆ How to Install Toolblock and Blade

Correct Way

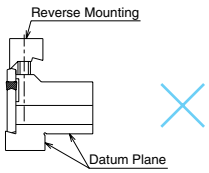


Incorrect way





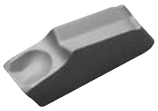
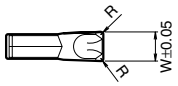
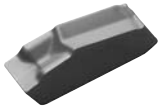
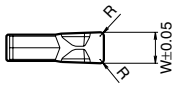
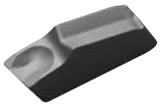
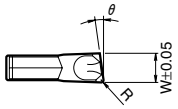
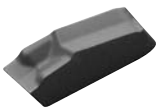
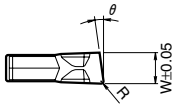
Incorrect Setting of Clamp Element



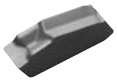
If the clamp element is mounted reversely, a large gap is produced between the clamp element and the toolblock, and the blade may come off during the cutting.
Watch the setting carefully for the safety.

● : Std. Stock ○ : Check Availability R : R-hand Only

● Applicable Insert

Shape (Handed Insert shows Right-hand)		Description		Dimension (mm) W	Dimension (mm) R	Angle (°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR660	PVD Coated PR930	Carbide KW10
		**TKN**	**1.6**	1.6	0.15		○	○	●	○	●
			2	2.2	0.20		●	●	●	●	●
			2.4	2.4	0.20		○	○	●	●	○
			3	3.1	0.25		●	●	●	●	●
			4	4.1	0.30		●	●	●	●	●
			4.8	4.8	0.30	-	-	○	-	-	-
			5	5.1	0.30		-	●	●	○	○
			6	6.4	0.35		-	●	●	-	○
			8	8.0	0.40		-	○	●	-	-
			9	9.6	0.45		-	○	●	-	-
 Low Feed		**TKN**	**1.6-P**	1.6	0.20		-	●	○	●	○
			2-P	2.2	0.20	-	○	●	●	○	●
			3-P	3.1	0.25		○	●	●	●	●
 Lead Angled		**TK$^{R}_{L}$**	**1.6**	1.6	0.15	8°	-	○	●	R	R
			2	2.2	0.20	8°	R	●	○	R	○
			2.4	2.4	0.20	8°	-	○	○	R	R
			3	3.1	0.25	8°	●	●	●	●	R
			3-15D	3.1	0.25	15°	-	●	-	-	-
			4	4.1	0.30	8°	R	●	L	R	○
			5	5.1	0.30	8°	-	R	○	-	○
 Low Feed / Lead Angled		**TK$^{R}_{L}$**	**1.6-P**	1.6	0.20		-	R	○	●	R
			2-P	2.2	0.20	8°	-	R	●	R	R
			3-P	3.1	0.25		R	●	●	R	R

Recommended Cutting Conditions ➡ P.283

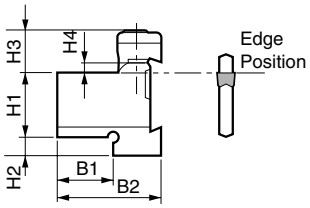
Application	Chipbreaker		Advantage
General Cutting-Off	Standard (No Indication)		General Cutting-Off Type to be used at f over 0.1mm/rev. Very good at Evacuating Chips.
Low Feed Cutting-Off	**P**		Chipbreaker specially developed for Low Feed Rate machining at Automatic Lathe, etc. Chips are curled small at f 0.03～0.08mm/rev. Excellent Chip Evacuation Performance.

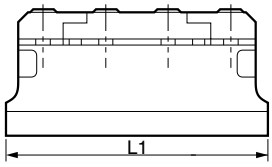
◆ Insert's Edge Shape (CERACUT Cut-Off)

Edge Shape	Chamfer + R-honing	Sharp Edge	Chamfer + R-honing
			
Std. Chipbreaker	**TN90 CR9025/PR660**	**PR930/KW10**	-
P-Chipbreaker	-	-	**TN90/CR9025 PR660/PR930/KW10**

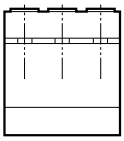
· Sharp Edge Spec. can make Cutting Resistance 40% less than that of Chamfer Edge.

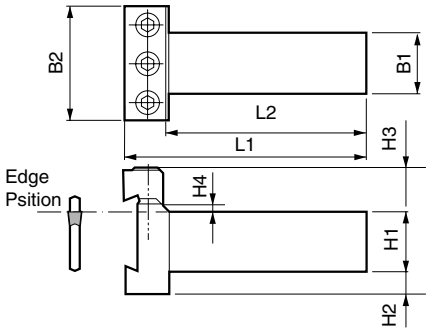
KTKTB (Separate type)





KTKTBF (Separate & Perpendicular type)

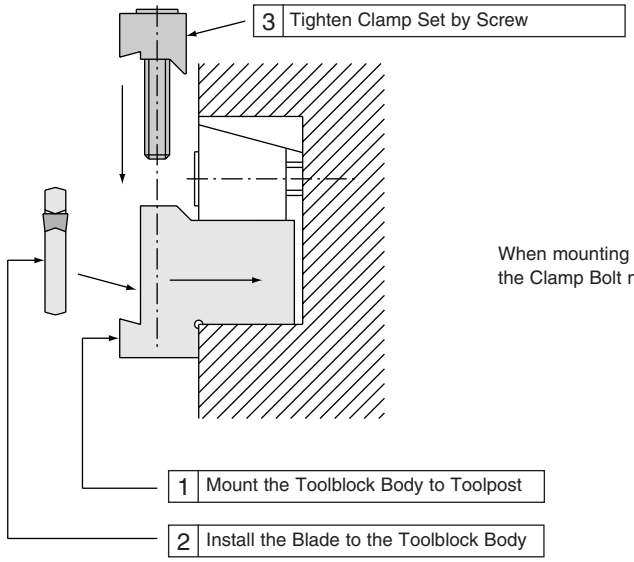


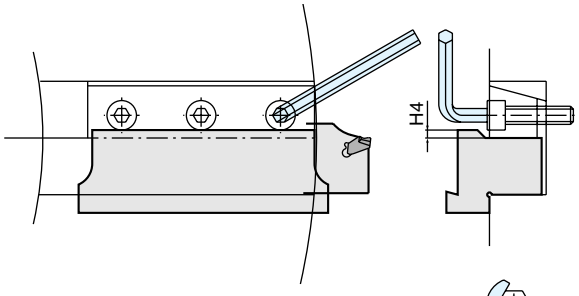


● Toolblock Dimension

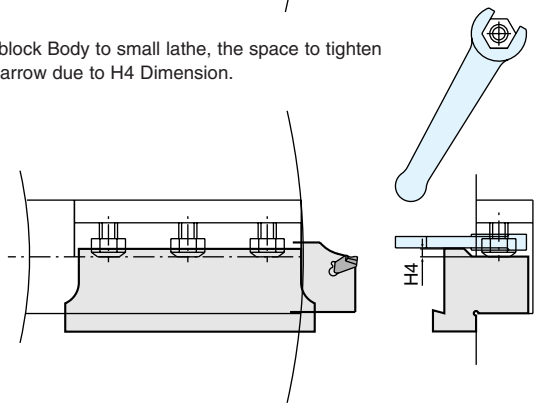
Description		Stock	Dimension (mm)								Spare Parts				Applicable Blade	
											Clamp Set		Screw	Wrench	Cutting-Off	Face Grooving
			H1	H2	H3	H4	B1	B2	L1	L2	Separate type	Integral type			P. 274	P. 259
KTKTB	**16-19**	●	16	4	12	2	15.5	29.5	76	-	-	**BSC-1**	**HH5X25**	**LW-4**	KTKB19-○S KTKB19-○SS	-
	20-19	○	20	4	12	2	19	34	76	-						
	16-26	●	16	13	14	2.5	15.5	31.5	86	-	**BCS-2**	-	**HH6X30**	**LW-5**	KTKB26-○S KTKB26-○SS	-
	20-26	●	20	9	14	2.5	19	36	86	-						
	20-32	●	20	13	17	3.5	19	38	100	-	**BCS-3**	-	**HH6X30**	**LW-5**	KTKB32-○S KTKB32-○SS KTKB[R/L]32-○S	KFTB[R/L]○○○○-4S KFTB[R/L]○○○○-5S
	25-32	●	25	8	17	3.5	23	42	110	-	**BCS-4**					
	32-32	●	32	5	17	3.5	29	48	110	-						
KTKTBF	**25-32**	●	25	9.5	17	3.5	25	48	102	84.5	-	**BCS-5**	**HH6X30**	**LW-5**	KTKB32-○S KTKB32-○SS KTKB[R/L]32-○S	KFTB[R/L]○○○○-4S KFTB[R/L]○○○○-5S
	32-32	○	32	2.5	17	3.5	32	48	117	99.5						

◆ How to mount Toolblock





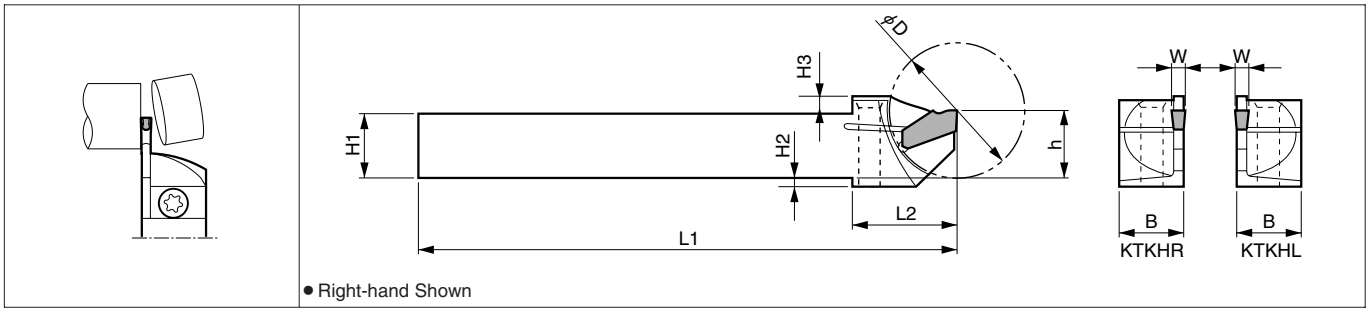
When mounting the Toolblock Body to small lathe, the space to tighten the Clamp Bolt may be narrow due to H4 Dimension.



● : Std. Stock ○ : Check Availability

Cutting-Off Toolholders (Integral Shank / Bolt Clamp) CERACUT Cut-Off

KTKH-B For Automatic Lathe (Long Shank type)

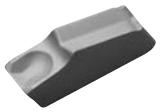
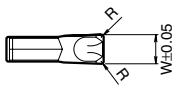
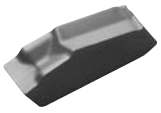
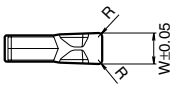
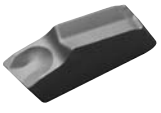
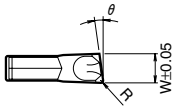
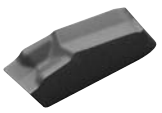
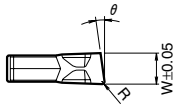


● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Cutting Dia. φDmax	Dimension (mm) H1=h	H2	H3	B	L1	L2	Width W	Spare Parts: Clamp Bolt	Spare Parts: Wrench	Spare Parts: Wrench	Spare Parts: Wrench	Applicable Insert
KTKH R/L	0808K-1.6-125B	●	●	10	8	4	2	8	125	13.0	1.6	SE-40120TR	FT-15	-	LTK-5	TKN1.6(-P) TK R/L 1.6(-P)
	1010K-1.6-125B	●	●	20	10	2.5	2	10	125	16.8						
	1212M-1.6-150B	●	●	25	12	0	2	12	150	18.8						
	1414M-1.6-150B	●	●	26	14	0	2	14	150	19.8						
	1010K-2-125B	●	●	20	10	5	3	10	125	16.8	2.2 2.4	SE-40120TR	FT-15	-	LTK-5	TKN2(-P) TK R/L 2(-P) TKN2.4 TK R/L 2.4
	1212M-2-150B	●	●	25	12	2	3	12	150	18.8						
	1616M-2-150B	●	●	32	16	0	3	16	150	23.8		SE-50125TR	-	LTW-20		
	1616M-3-150B	●	●	32	16	4	4	16	150	23.8	3.1	SE-50125TR	-	LTW-20	LTK-5	TKN3(-P),TK R/L 3(-P)

● Applicable Insert

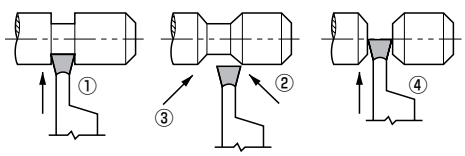
Shape (Handed Insert shows Right-hand)		Description		Dimension (mm) W	Dimension (mm) R	Angle (°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR660	PVD Coated PR930	Carbide KW10
		TKN	1.6	1.6	0.15		○	○	●	○	●
			2	2.2	0.20	-	●	●	●	●	●
			2.4	2.4	0.20		○	○	●	●	○
			3	3.1	0.25		●	●	●	●	●
 Low Feed		TKN	1.6-P	1.6	0.20		-	●	○	●	○
			2-P	2.2	0.20	-	○	●	●	○	●
			3-P	3.1	0.25		○	●	●	●	●
 Lead Angled		TK R/L	1.6	1.6	0.15	8°	-	○	●	R	R
			2	2.2	0.20	8°	R	●	○	R	○
			2.4	2.4	0.20	8°	-	○	○	R	R
			3	3.1	0.25	8°	●	●	●	●	R
			3-15D	3.1	0.25	15°	-	●	-	-	-
 Low Feed / Lead-Angled		TK R/L	1.6-P	1.6	0.20		-	R	○	●	R
			2-P	2.2	0.20	8°	-	R	●	R	R
			3-P	3.1	0.25		R	●	●	R	R

Recommended Cutting Conditions ➡ P.283

◆ Application Example of CERACUT Cut-Off

1. Cutting-Off after Chamfering

① Grooving ②③ Chamfering ④ Cutting-Off

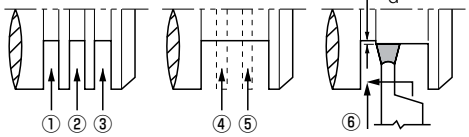


2. Wide Grooving

①～⑤ Groove Widening

⑥ Traverse Finishing

(Value of a*p* "d" shall be under the value of Corner-R)

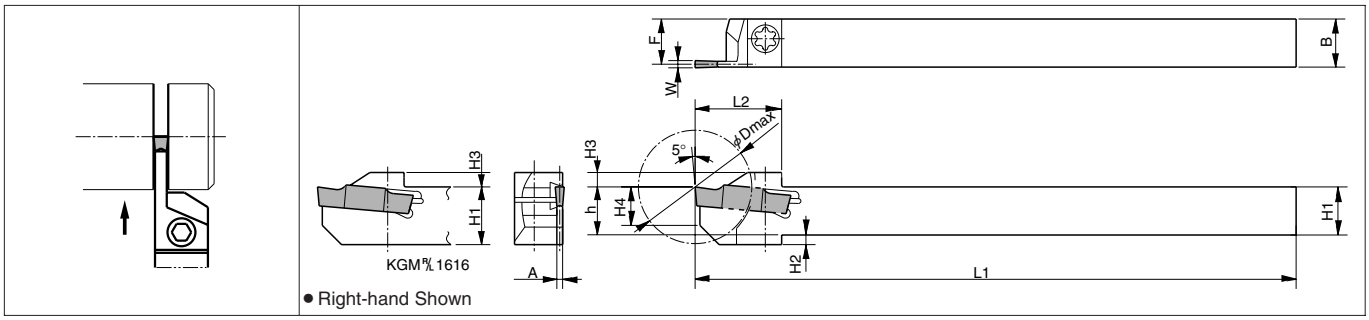


(In order to prevent the both corners' unequal wear)

● : Std. Stock ○ : Check Availability R : R-hand Only

Cutting-Off Toolholders

KGM For Automatic Lathe (Long Shank type)



● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Cutting Dia. φDmax	Dimension (mm) H1=h	H2	H3	H4	B	L1	L2	F	A	Width W(mm) MIN.	MAX.	Spare Parts Screw	Wrench
KGM□	0810K-1.5-125	●	●	10	8	4	3	8	10	125	18	9.4	1.2				
	1010K-1.5-125	●	●	20	10	2	3	8	10	125	18	9.4	1.2	1.5	2.0	SE-40120TR	LTW-15S
	1212M-1.5-150	●	●	25	12	2	4	10	12	150	20.5	11.4	1.2				
	0810K-2-125	●	●	10	8	4	3	8	10	125	18	9.2	1.6				
	1010K-2-125	●	●	20	10	2	3	8	10	125	18	9.15	1.7	2.0	3.0	SE-40120TR	LTW-15S
	1212M-2-150	●	●	25	12	2	4	10	12	150	19	11.15	1.7				
	1616M-2-150	●	●	32	16	-	4	9	16	150	24.5	15.15	1.7			SE-50125TR	LTW-20
	1010K-2.5-125	●	●	20	10	2	3	8	10	125	18	9	2.0			SE-40120TR	LTW-15S
	1212M-2.5-150	●	●	25	12	2	4	10	12	150	20.5	11	2.0	2.4	3.0		
	1616M-2.5-150	●	●	32	16	-	4	9	16	150	25.5	15	2.0			SE-50125TR	LTW-20
	1616M-3-150	●	●	32	16	-	4	9	16	150	25.5	14.8	2.4	3.0	4.0	SE-50125TR	LTW-20

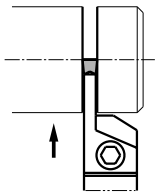
● Applicable Insert

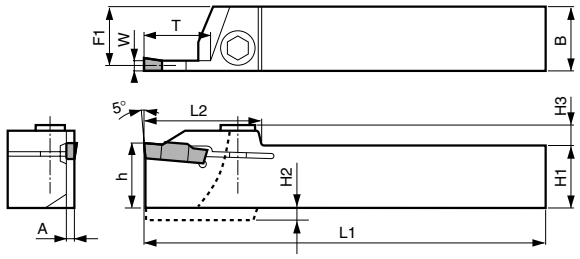
Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R / Copying	Cutting-Off	Cutting-Off	Cutting-Off	Cutting-Off	Cutting-Off
Ref. Page	218	218	218	218	280	280	280	280	280
Shape / Toolholder		MS	MG		MT	NB	TK	TK	
KGM□…1.5	-	-	-	-	GMM1520..MT GMM2020..MT GMM1520□..MT GMM2020□..MT	GMM1520..NB GMM2020..NB	GMM2020..TK GMM2020□..TK	GMN2..TK GM□2..TK	-
KGM□…2	GMM2420.. GMG3020.. GMM3020..	GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	GMM2020..MT GMM2520..MT GMM3020..MT GMM2020□..MT GMM2520□..MT GMM3020□..MT	GMM2020..NB GMM2520..NB GMM3020..NB	GMM2020..TK GMM2520..TK GMM3020..TK GMM2020□..TK GMM2520□..TK GMM3020□..TK	GMN2..TK GMN3..TK GM□2..TK GM□3..TK	GMN2 GMN2.2 GMN3 GM□2.2 GM□3
KGM□…2.5	GMM2420.. GMG3020.. GMM3020..	GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	GMM2520..MT GMM3020..MT GMM2520□..MT GMM3020□..MT	GMM2520..NB GMM3020..NB	GMM2520..TK GMM3020..TK GMM2520□..TK GMM3020□..TK	GMN3..TK GM□3..TK	GMN3 GM□3
KGM□…3	GMG3020.. GMM3020.. GMG4020.. GMM4020..	GMM3020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	GMM3020..MT GMM3020□..MT	GMM3020..NB	GMM3020..TK GMM3020□..TK	GMN3..TK GMN4..TK GM□3..TK GM□4..TK	GMN3 GMN4 GM□3 GM□4

Recommended Cutting Conditions ➡ P.283

● : Std. Stock ○ : Check Availability

■ KGM-T





● Right-hand Shown

● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F1	A	T		Width W(mm) MIN.	MAX.	Spare Parts Screw		Wrench	
KGM□	2012K-2T17	○	○	20	-	6	12	125	33	11.15	1.7	17				SB-5TR	-	LTW-20	-
	2020K-2T17	●	●	20	-	6	20	125	33	19.15	1.7	17		2.0	2.5	-	HH5X16	-	LW-4
	2525M-2T17	●	●	25	-	6	25	150	33	24.15	1.7	17					HH5X25		
	1616H-3T20	●	●	16	4	6	16	100	36	14.8	2.4	20				-	HH5X16	-	LW-4
	2012K-3T20	○	○	20	-	6	12	125	36	10.8	2.4	20		3.0	4.0	SB-5TR	-	LTW-20	-
	2020K-3T20	●	●	20	-	6	20	125	36	18.8	2.4	20				-	HH5X16	-	LW-4
	2525M-3T20	●	●	25	-	6	25	150	36	23.8	2.4	20					HH5X25		
	2020K-4T20	●	●	20	-	6	20	125	36	18.3	3.4	20				-	HH5X16	-	LW-4
	2525M-4T20	●	●	25	-	6	25	150	36	23.3	3.4	20		4.0	5.0		HH5X25		
	2525M-4T25	●	●	25	-	6	25	150	41	23.3	3.4	25							
	2525M-5T25	●	●	25	-	6	25	150	42	22.8	4.4	25		5.0	6.0	-	HH5X25	-	LW-4
	3232P-5T25	○	○	32	-	6	32	170	42	29.8	4.4	25							
	2525M-6T30	●	●	25	-	6	25	150	45	22.4	5.2	30		6.0	6.0	-	HH5X25	-	LW-4

· T Dimension shows the distance from Toolholder to Cutting Edge. See the Table(P281) for the relationship between the available Grooving Depth and Cutting Dia.
· When using GMG/GMM type(2-corner use insert), Set up the Grooving Depth under 15mm.

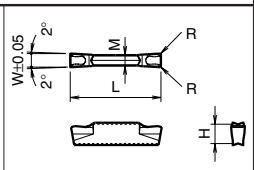
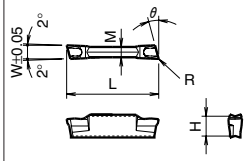
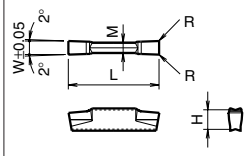
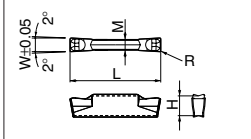
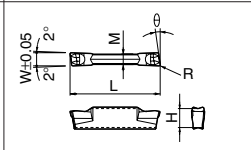
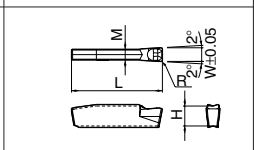
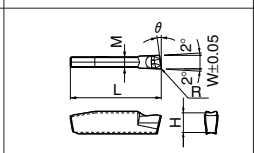
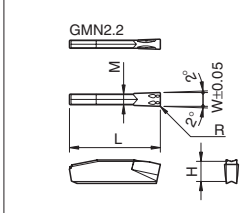
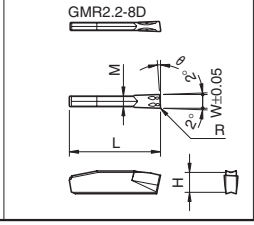
● Applicable Insert

Application	Grooving/Traversing	Grooving/Traversing	Grooving	Full-R / Copying	Full-R / Copying	Cutting-Off	Cutting-Off	Cutting-Off	Cutting-Off	Cutting-Off
Ref. Page	218	218	218	218	218	280	280	280	280	280
Shape / Toolholder		MS	MG			MT	NB	TK	TK	
KGM□…2T	GMM2420..	-	GMG2520..MG	-	-	GMM2020..MT GMM2520..MT GMM2020□..MT GMM2520□..MT	GMM2020..NB GMM2520..NB	GMM2020..TK GMM2520..TK GMM2020□..TK GMM2520□..TK	GMN2..TK GM□2..TK	GMN2 GMN2.2 GM□2.2
KGM□…3T	GMG3020.. GMM3020.. GMG4020.. GMM4020..	GMM3020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	-	GMM3020..MT GMM3020□..MT	GMM3020..NB	GMM3020..TK GMM3020□..TK	GMN3..TK GMN4..TK GM□3..TK GM□4..TK	GMN3 GMN4 GM□3 GM□4
KGM□…4T	GMG4020.. GMM4020.. GMG5020.. GMM5020..	GMM4020..MS GMM5020..MS	GMG4020..MG GMG5020..MG	GMG4020..R GMM4020..R GMG5020..R GMM5020..R	-	-	-	-	GMN4 GM□4..TK	GMN4 GMN5 GM□4
KGM□…5T	GMG5020.. GMM5020.. GMG6020.. GMM6020..	GMM5020..MS GMM6020..MS	GMG5020..MG GMG6020..MG	GMG5020..R GMM5020..R GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN5 GMN6
KGM□…6T	GMG6020.. GMM6020..	GMM6020..MS	GMG6020..MG	GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN6

Recommended Cutting Conditions P.283

Cutting-Off Toolholders

● Applicable Insert

Shape (Handed Insert shows Right-hand)		Description		Dimension (mm) W	R	L	H	M	Angle (°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
2-Corner Use		GMM	1520-MT	1.5	0.0 / 0.05	20	4.3	1.2	-			●	○			
			2020-MT	2.0	0.0 / 0.05	20	4.3	1.5	-		●	●	●	●		
			2520-MT	2.5	0.0 / 0.05	20	4.3	1.9	-		○	●	●	○		
Sharp-Cutting Oriented			3020-MT	3.0	0.0 / 0.05	20	4.3	2.3	-		●	●	●	○		
2-Corner Use		GMM	1520R/L-MT-15D	1.5	0.0 / 0.05	20	4.3	1.2	15°			R	●	○		
			2020R/L-MT-8D	2.0	0.0 / 0.05	20	4.3	1.5	8°				R			
			2020R/L-MT-15D	2.0	0.0 / 0.05	20	4.3	1.5	15°		○	R	●	●		
			2520R/L-MT-15D	2.5	0.0 / 0.05	20	4.3	1.9	15°		○	R	●	○		
			3020R/L-MT-4D	2.5	0.0 / 0.05	20	4.3	1.9	4°				●			
Sharp-Cutting Oriented Lead Angled			3020R/L-MT-15D	3.0	0.0 / 0.05	20	4.3	2.3	15°		●	R				
2-Corner Use		GMM	1520-NB	1.5	0.0 / 0.05	20	4.3	1.2	-				○	●		
			2020-NB	2.0	0.0 / 0.05	20	4.3	1.5	-		●		●	●		
			2520-NB	2.5	0.0 / 0.05	20	4.3	1.9	-		○		○	○		
Sharp-Cutting Oriented Without Chipbreaker			3020-NB	3.0	0.0 / 0.05	20	4.3	2.3	-		○		●	●		
2-Corner Use		GMM	2020-TK	2.0	0.20			1.5				●	○	○		
			2520-TK	2.5	0.20	20	4.3	1.9	-		○	●	○	○		
Stability-Oriented			3020-TK	3.0	0.25			2.3			●	●	○	○		
2-Corner Use		GMM	2020R/L-TK-8D	2.0	0.20			1.5	8°			R	R	R		
			2520R/L-TK-8D	2.5	0.20	20	4.3	1.9	8°		R	R	R	R		
Stability-Oriented Lead Angled			3020R/L-TK-8D	3.0	0.25			2.3	8°		R	R	R	R		
1-Corner Use		GMN	2-TK	2.0	0.20			1.8				○	○	○		
			3-TK	3.0	0.25	20	4.3	2.3	-		○	○	○	○		
Stability-Oriented			4-TK	4.0	0.30			3.3			○	○	○	○		
1-Corner Use		GMR/L	2-TK-8D	2.0	0.20			1.8	8°			R	R	R		
			3-TK-8D	3.0	0.25	20	4.3	2.3	8°		R	R	R	R		
Stability-Oriented Lead Angled			4-TK-8D	4.0	0.30			3.3	8°		R	R	R	R		
1-Corner Use		GMN	2.2	2.2	0.17			1.8		●	●		●	●		
			3	3.0	0.20			2.3		○	●		○	●		
			4	4.0	0.25	20	4.3	3.3	-	○	●		○	○		
			5	5.0	0.80			4.2		●	●		○	○		
Sharp-Cutting Oriented			6	6.0	0.80			5.2			●		○	○		
1-Corner Use		GMR/L	2.2-8D	2.2	0.17			1.8	8°	●	●		●	●		
			2.2-15D	2.2	0.00			1.8	15°	●	R		●	●		
			3-4D	3.0	0.20	20	4.3	2.3	4°	R	●		●	●		
			3-15D	3.0	0.20			2.3	15°		●					
Sharp-Cutting Oriented Lead Angled			4-4D	4.0	0.25			3.3	4°	R	○		R	R		

● : Std. Stock ○ : Check Availability R : R-hand Only

◆ CERACUT Plunge & Turn (MT/NB)

Edge Shape	Chamfer + R-honing Corner-R 0.05	Chamfer + R-honing Sharp Corner
		
MT-Chipbreaker	**CR9025/PR915**	**PR930/KW10**
Edge Shape	R-honing Corner-R 0.05	Sharp Edge Sharp Corner
		
Without Chipbreaker (-NB)	**CR9025**	**PR930/KW10**

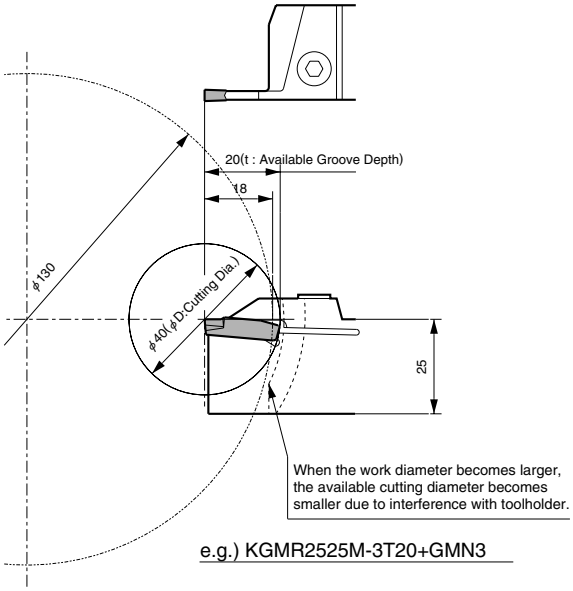
◆ CERACUT Plunge & Turn (TK)

Edge Shape	Chamfer + R-honing Corner-R 0.2～0.3	Sharp Edge Corner-R 0.2～0.3
		
TK-Chipbreaker	**CR9025/PR915**	**PR930/KW10**

· Sharp Edge Spec. can make Cutting Resistance 40% less than that of Chamfer Edge.

◆ Available Cutting Diameter of KGM / KGM-T type

There is a limit to available grooving depth depending on the workpiece diameter.



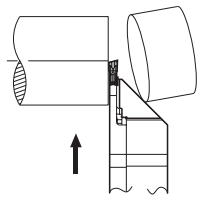
◆ KGM Available Cutting Diameter Table

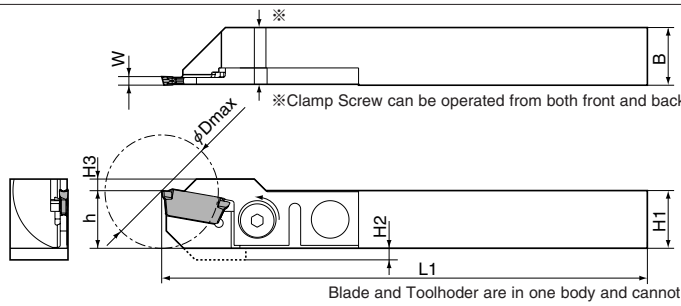
Toolholder		φD (Cutting Dia.)																
KGM形	0810K-1.5-125	-	-	-	-	-	-	-	-	-	-	-	-	10	14	16	32	∞
	1010K-1.5-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-1.5-150	-	-	-	-	25	26	28	32	36	40	60	100	∞	∞	∞	∞	∞
	0810K-2-125	-	-	-	-	-	-	-	-	-	-	-	-	10	14	16	32	∞
	1010K-2-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-2-150	-	-	-	-	25	26	28	50	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1616M-2-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1010K-2.5-125	-	-	-	-	-	-	-	20	25	32	40	60	∞	∞	∞	∞	∞
	1212M-2.5-150	-	-	-	-	25	26	28	32	36	40	60	100	∞	∞	∞	∞	∞
	1616M-2.5-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
	1616M-3-150	32	40	50	60	80	100	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
Available Grooving Depth: t (mm)		16	15	14	13	12.5	12	11	10	9	8	7	6	5	4	3	2	1

◆ KGM-T Available Cutting Diameter Table (GMN·GM形 When using 1-corner use type)

Toolholder		φD (Cutting Dia.)												
KGM形	2012K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2020K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2525M-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	1616H-3T20	-	-	-	-	-	40	54	70	100	180	∞	∞	∞
	2012K-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2020K-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-3T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2020K-4T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-4T20	-	-	-	-	-	40	90	130	240	∞	∞	∞	∞
	2525M-4T25	-	-	50	140	240	∞	∞	∞	∞	∞	∞	∞	∞
	2525M-5T25	-	-	50	140	240	∞	∞	∞	∞	∞	∞	∞	∞
	3232P-5T25	-	-	50	280	600	∞	∞	∞	∞	∞	∞	∞	∞
	2525M-6T30	100	300	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
Available Grooving Depth: t (mm)		30	27	25	23	22	20	19	18	17	16	15	14	under 13

■ KGMB





● Right-hand Shown

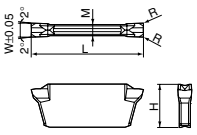
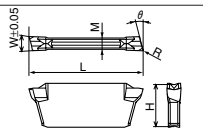
Blade and Toolhoder are in one body and cannot remove them separately.

● Toolholder Dimension

Description		Stock R	Stock L	Cutting Dia. φDmax	Dimension (mm) H1=h	H2	H3	B	L1	Width (mm) W	Spare Parts Screw	Spare Parts Wrench
KGMB R/L	0810K-1.5-125	●		10	8	2	4	10	125	1.5	GS-4090TL/R W	LW-2
	1010K-1.5-125	●	●	20	10	-	2	10	125			
	1212M-1.5-150	●	●	20	12	-	2	12	150			
	1616M-1.5-150	●		20	16	-	2	16	150			
	0810K-2-125	●		10	8	2	4	10	125	2.0		
	1010K-2-125	●	●	20	10	-	2	10	125			
	1212M-2-150	●	●	20	12	-	2	12	150			
	1616M-2-150	●		20	16	-	2	16	150			

· Screw: GS-4090TLW for R-Hand Toolholder, GS-4090TRW for L-Hand Toolholder

● Applicable Insert

Shape (Handed Insert shows Right-hand)		Description	Dimension (mm) W	R	L	H	M	Angle (°) θ	Insert Grade: Cermet TN90	CVD Coated CR9025	PVD Coated PR915	PVD Coated PR930	Carbide KW10	CBN KBN10B	Diamond KPD010
 Sharp Edge		GMMB 1512	1.5	0.0	12	4.3	1.2	-				●	●		
		GMMB 2012	2.0				1.7					●	●		
 Sharp Edge / Lead Angled		GMMB 1512R/L-15D	1.5	0.0	12	4.3	1.2	15°				●	○		
		GMMB 2012R/L-15D	2.0				1.7					●	○		

◆ Recommended Cutting Conditions

Work Material	Recommended Grade (Vc m/min) PVD Coated PR930	Carbide KW10	Width (mm) 1.5 f (mm/rev)	2.0				Remark
Carbon Steel (SXXC etc.)	★ 60～130		0.01～0.03	0.01～0.03				Wet
Alloy Steel (SCM etc.)	★ 60～130		0.01～0.03	0.01～0.03				
Stainless Steel (SUS304 etc.)	★ 50～100		0.01～0.02	0.01～0.02				
Cast Iron (FC · FCD etc.)		★ 50～100	0.01～0.05	0.01～0.05				
Aluminum		★ 200～450	0.01～0.05	0.01～0.05				
Brass		★ 100～200	0.01～0.03	0.01～0.03				

★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

Recommended Cutting Conditions

■ Recommended Cutting Conditions — CERACUT Cut-Off

Work Material	Recommended Grade (V_C m/min)					Width (mm)					Remark
	Cermet	CVD Coated	PVD Coated		Carbide	1.6	2.2/2.4	3.1	4.1	4.8～9.6	
	TN90	**CR9025**	**PR660**	**PR930**	**KW10**	f (mm/rev)					
Carbon Steel (SXXC etc.)	☆ 120～200	☆(Width: less than 3.1) ★(Width: more than 4.1) 80～180	☆ 60～130	☆(Width: less than 3.1) ★(Width: more than 4.1) 60～130		0.02～0.08	0.04～0.18	0.05～0.25	0.08～0.30	0.15～0.40	Wet
Alloy Steel (SCM etc.)	☆ 100～160	☆(Width: less than 3.1) ★(Width: more than 4.1) 70～150	☆ 60～130	☆(Width: less than 3.1) ★(Width: more than 4.1) 60～130		0.02～0.08	0.04～0.18	0.05～0.25	0.08～0.30	0.15～0.40	
Stainless Steel (SUS304 etc.)	☆ 80～150	☆ 60～140	★ 50～120	☆ 60～140		0.02～0.06	0.04～0.12	0.05～0.18	0.08～0.25	0.10～0.30	
Cast Iron (FC · FCD etc.)	–	–	–	–	★ 50～100	0.02～0.08	0.05～0.12	0.10～0.25	0.10～0.30	0.15～0.35	
Aluminum	–	–	–	–	★ 200～450	0.02～0.10	0.05～0.10	0.05～0.20	0.05～0.25	0.10～0.25	
Brass	–	–	–	–	★ 100～200	0.02～0.10	0.05～0.10	0.05～0.15	0.05～0.20	0.10～0.25	

■ Recommended Cutting Conditions — CERACUT Plunge & Turn

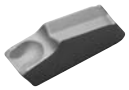
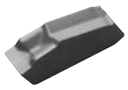
(In case of Using GMM-MT, GMM-TK, GMM-NB type Insert)

Work Material	Recommended Grade (V_C m/min)					Width (mm)					Remark
	Cermet	CVD Coated	PVD Coated		Carbide	1.5	2.0/2.5	3.0	4.0		
	-	**CR9025**	**PR915**	**PR930**	**KW10**	f (mm/rev)					
Carbon Steel (SXXC etc.)	-	☆ 80～180	★ 60～150	☆ 60～130		0.01～0.04	0.02～0.15	0.03～0.20	0.08～0.30		Wet
Alloy Steel (SCM etc.)	-	☆ 70～150	★ 60～150	☆ 60～130		0.01～0.04	0.02～0.15	0.03～0.20	0.08～0.30		
Stainless Steel (SUS304 etc.)	-	☆ 60～140	★ 50～140	☆ 50～120		0.01～0.03	0.02～0.10	0.03～0.15	0.08～0.25		
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 50～100	0.01～0.05	0.05～0.12	0.10～0.25	0.10～0.30		
Aluminum	-	-	-	-	★ 200～450	0.01～0.05	0.05～0.10	0.05～0.20	0.05～0.25		
Brass	-	-	-	-	★ 100～200	0.01～0.05	0.05～0.10	0.05～0.15	0.05～0.20		

● When machining Steel and Stainless Steel by 4mm width Insert of PR930, decrease the f by 20%.

★: 1st Recommendation ☆: 2nd Recommendation

■ CERACUT Cut-Off Chipbreakers

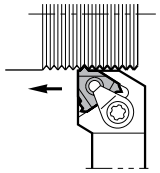
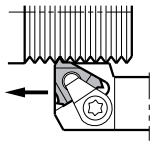
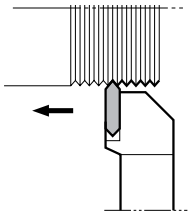
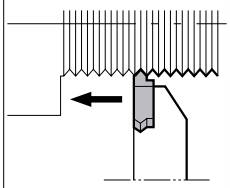
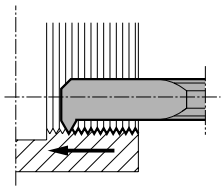
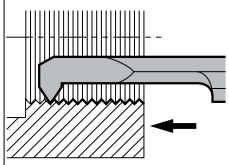
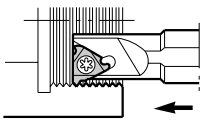
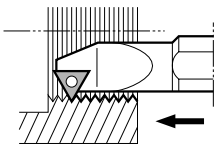
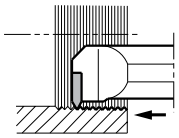
Series	Application	Type	Shape	Advantage	
Cut-Off	General Cutting Off	TK (Std.)		1-Corner	General Cutting-Off type to be Used at Feed Rate over 0.1mm/rev. Superior Chip Evacuation Performance
	Low Feed Cutting Off	TK-P		1-Corner	Chipbreaker specially designed for Low Feed Machining at Automatic Lathe, etc. Chips are curled small at f = 0.03～0.08mm/rev.
Plunge & Turn	Cutting Off	GMMB		2-Corner	At Gang type Toolpost, Insert Replacement can be operated from Back Side. Sharp Edge & Sharp Corner restrains Burr Generation and Boss Remainder
	Cutting-Off Deep Grooving	GMM-MT		2-Corner	Specific Chipbreaker for Cutting-off Operation that requires Sharp Cutting Performance. It can minimize the Boss Remainder.
	Cutting-Off Deep Grooving	GMM-NB		2-Corner	Cutting Edge is flat Non-Chipbreaker Shape. Good Performance to Brass, etc.
	Cutting-Off Deep Grooving	GMM-TK		2-Corner	Stability-oriented Design with Chipbreaker for Cutting-off and Large Corner-R. 2-Corner Use and suitable for Cost-Cut.
	Cutting-Off Deep Grooving	GMN-TK		1-Corner	Same Chipbreaker Geometry as GMM-TK. 1-Corner Use and Wide Application Range.
	Cutting-Off Deep Grooving	GMN (Std.)		1-Corner	Mainly for Deep Grooving, but available to Groove Widening and Traversing owing to projection near Side Cutting Edge. 1-Corner Use and Wide Application Range. Availale to Cut-Off Application too.

Threading

285～314

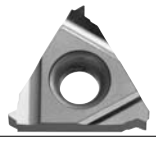
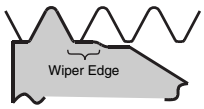
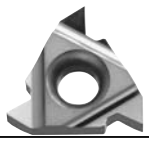
Product Lineup

■ Product Lineup

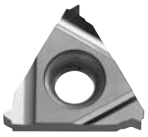
			KTN (P.290)	KTNS (P.290)	KTT (P.292)	KTTX (P.293)	
External Threading							
Thread Type	Metric	mm	0.5～5.0	0.5～2.5	0.5～3.5	0.5～2.0	
	Unified	TPI	24～11	24～11	56～7	56～14	
	Parallel Pipe	TPI	28～11	28～11	28～11	28～11	
	Whitworth	TPI	24～9	24～9	24～7	24～14	
	Tapered Pipe	TPI	28～11	28～11	—	—	
	American National Pipe	TPI	18,14,11.5	18,14,11.5	—	—	
	30° Trapezoidal	mm	2.0～5.0	2.0～3.0	—	—	
			VNT (P.294)	PST-S (P.295)	SIN CIN (P.296)	S···STWP S···STWP-E (P.299)	KITG (P.300)
Internal Threading							
Min. Bore Dia. ϕA			4.5, 6.0	4.5, 6.0	6.4～37	12～25	35, 45
Thread Type	Metric	mm	0.75～1.5	0.75～1.5	0.5～5.0	0.75～3.5	0.5～3.0
	Unified	TPI	28～18	28～18	32～8	28～8	48～8
	Parallel Pipe	TPI	—	—	28～11	—	28～11
	Whitworth	TPI	—	—	24～11	—	24～8
	Tapered Pipe	TPI	—	—	28～11	—	—
	American National Pipe	TPI	—	—	18,14,11.5	—	—
	30° Trapezoidal	mm	—	—	2.0～5.0	—	—

■ Outlines of Threading Insert

● With and Without "Wiper Edge"

	Shape	Function	Feature
With Wiper Edge			①Smooth Thread Surface and High Quality ②Need to consider the a*p* value by Wiper Edge at preprocess ③Insert is selected every Pitch Size
Without Wiper Edge			①Thread's Corner tends to be Sharp Edged. ②Thread's O.D. or I.D. need to be finished at preprocess. ③One Insert can cope with various Pitch Sizes.

● With and Without "Chipbreaker"

	Shape	Condition	Cutting Resistance	Chip Length
Without Chipbreaker		· When Less Cutting Resistance is needed at Small or Thin Part Machining	Small	
1-Thread, With Chipbreaker		· When Better Chip Control is needed	Smaller a Little	
2-Thread, With Chipbreaker		①Less Pass Number and Less Machining Time ②For Rigid Work ③Wider Dead Space	Large (2 Edges engage in Threading)	

Guide for Threading

■ Guide for Threading

Bolded Grades are recommended.

Work Material / Insert Grade / Cutting Condition	Carbon Steel · Alloy Steel		Stainless Steel	Cast Iron
	TC40	TC60·PR630·**PR930**	TC60 PR630·PR660·**PR930**	**KW10**
Cutting Speed	100～150m/min		60～80m/min	100m/min
First a*p*(Radial)	under 0.25mm	under 0.3mm (Depending on Pitch Size)	under 0.25mm	under 0.3mm
No. of Pass	Set up a Few More Passes than that of Recommended Conditions	Same as Recommended Conditions	Set up a Few More Passes than that of Recommended Conditions	Same as Recommended Conditions
Coolant	Wet Cutting is recommended			

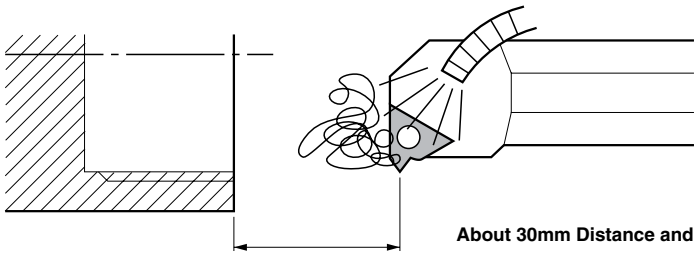
※When using Cermet insert, applying Light Honing to the Cutting Edge by Hand Lapper brings stable Performance.

Depth of Cut & Number of Pass ➡P.308～313
Recommended Cutting Conditions ➡P.314

■ Guide for Internal Threading

At Internal Threading, be careful for Chip Evacuation.
If the Entangled Chips damage the Insert, the Methods as follows are recommended.

1. Start the Threading from the Position of 30mm away from the Work.

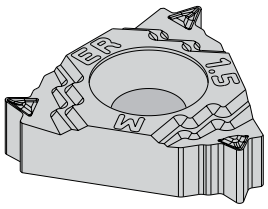


About 30mm Distance and remove Chips by Coolant every Pass.

2. Change the Insert Grade to PR930.

Replacing with PR930 of PVD coated carbide, the Stable Internal Grooving is obtained, since the Cutting Edge becomes strong and prevents Chipping.

■ Chip Control of Threading Insert with Chipbreaker



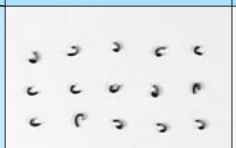
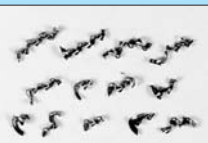
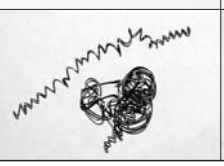
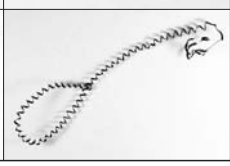
Threading Insert with "TS" Chipbreaker

Insert with TS Chipbreaker improves Chip Control.

· Advantage of TS Chipbreaker Insert

1."TS" breaks Chips small and shows good Chip Evacuation.
2. High Precision Molded Insert and Economical

● Cutting Conditions: V_C=100m/min, P=1.5 Pitch, No. of Pass: 6 Pass, SCM435, WET, Flank Infeed (External Threading)

Pass	1 Pass	2 Pass	3 Pass	5 Pass	6 Pass
TS Chipbreaker Insert					
Conventional Insert					

Summary of External Threading

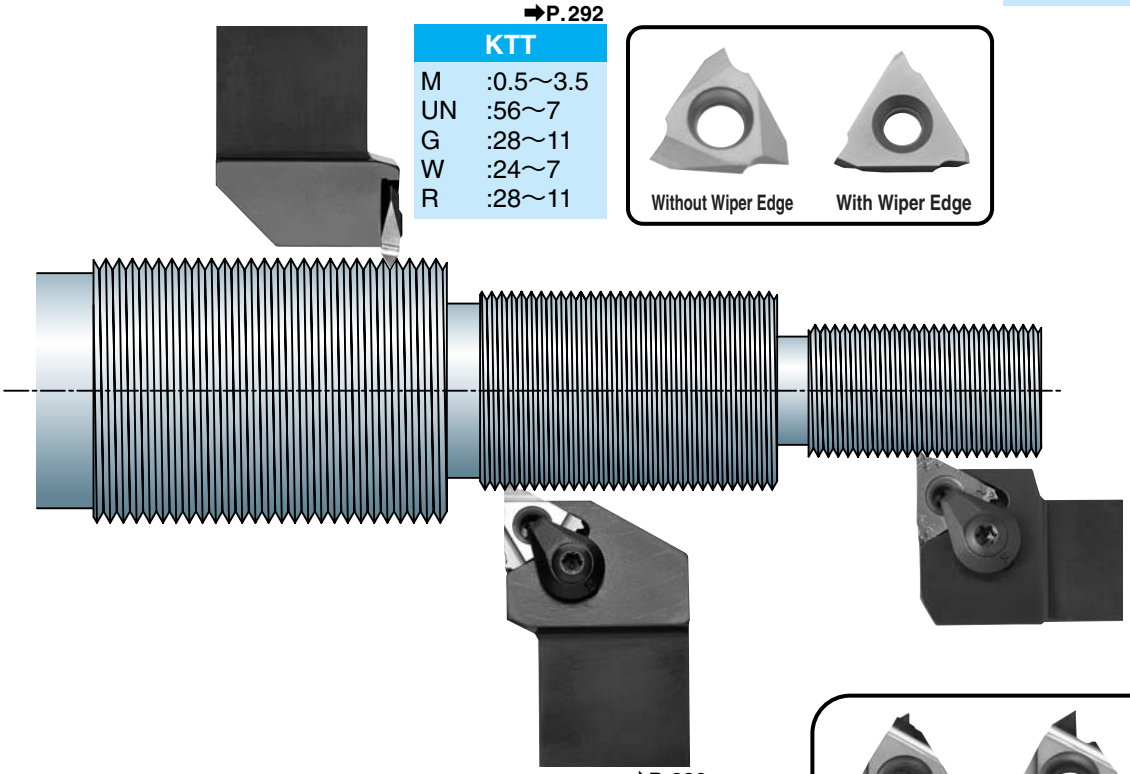
■ General External Threading

Male Thread			
	M	: Metric	(mm)
	UN	: Unified	(TPI)
	G	: Parallel Pipe	(TPI)
	W	: Whitworth	(TPI)
	R	: Tapered Pipe	(TPI)
	NPT	: American National Pipe	(TPI)
	Tr	: 30° Trapezoidal	(mm)

➡P.292

KTT

M	:0.5～3.5
UN	:56～7
G	:28～11
W	:24～7
R	:28～11



➡P.290

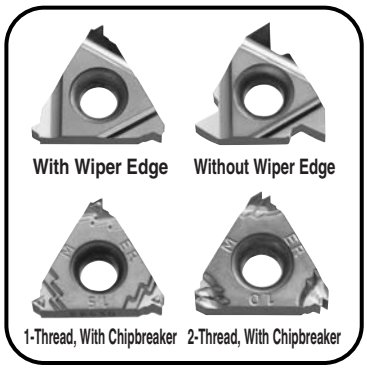
KTNS

M	:0.5～2.5
UN	:24～11
G	:28～11
W	:24～9
R	:28～11
NPT	:18～11.5
Tr	:2.0～3.0

➡P.290

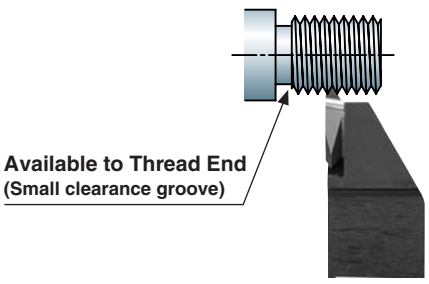
KTN

M	:0.5～5.0
UN	:24～11
G	:28～11
W	:24～9
R	:28～11
NPT	:18～11.5
Tr	:2.0～5.0



■ Small Dia. Parts External Threading

Small Shank



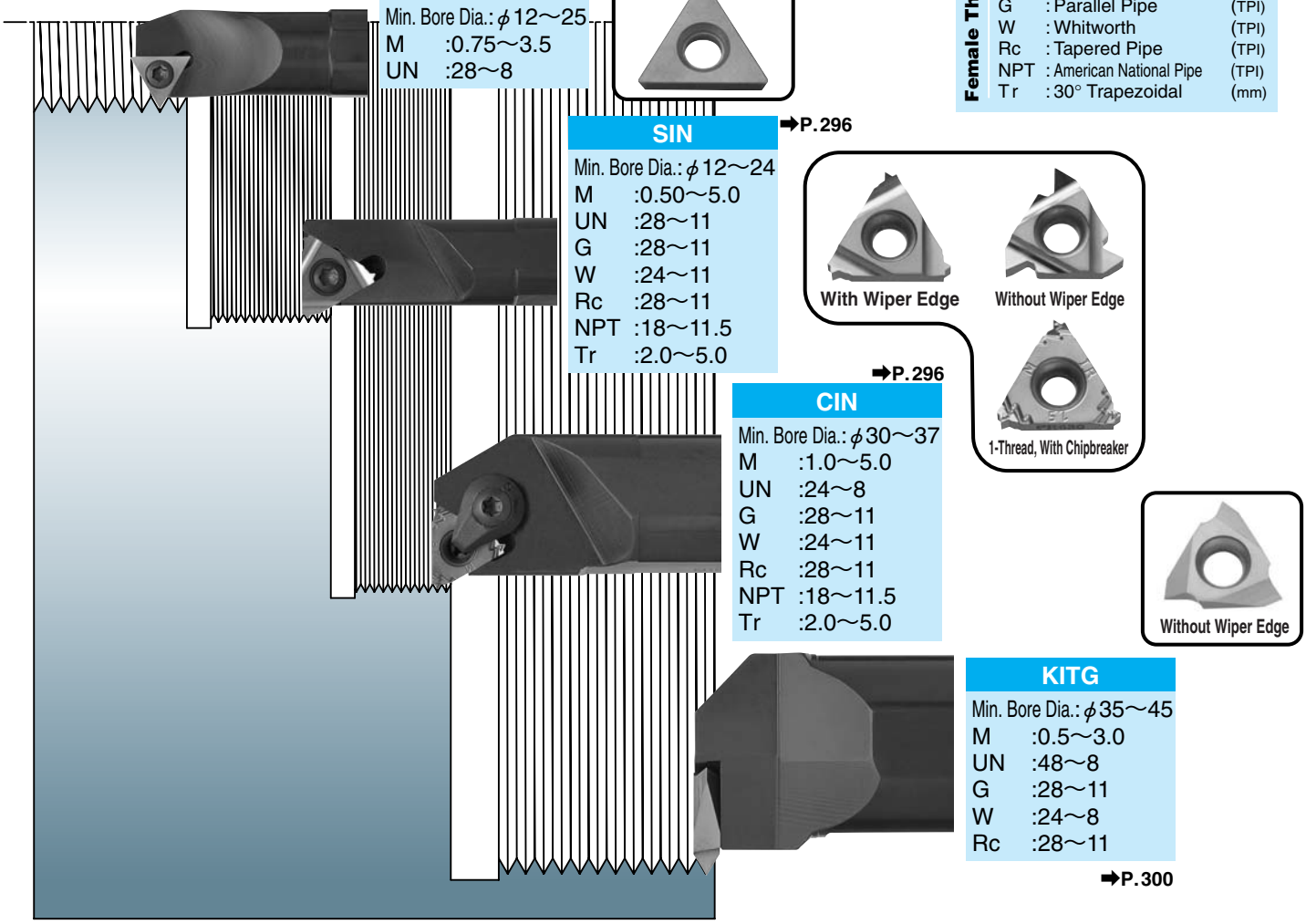
➡P.293

KTTX

M	:0.5～2.0
UN	:56～14
G	:28～11
W	:24～14
R	:28～11

Summary of Internal Threading

■ General Internal Threading ϕ12～



➡P.299

STWP
Min. Bore Dia.: ϕ12～25
M :0.75～3.5
UN :28～8

Without Wiper Edge

➡P.296

SIN
Min. Bore Dia.: ϕ12～24
M :0.50～5.0
UN :28～11
G :28～11
W :24～11
Rc :28～11
NPT :18～11.5
Tr :2.0～5.0

With Wiper Edge
Without Wiper Edge
1-Thread, With Chipbreaker

➡P.296

CIN
Min. Bore Dia.: ϕ30～37
M :1.0～5.0
UN :24～8
G :28～11
W :24～11
Rc :28～11
NPT :18～11.5
Tr :2.0～5.0

Without Wiper Edge

KITG
Min. Bore Dia.: ϕ35～45
M :0.5～3.0
UN :48～8
G :28～11
W :24～8
Rc :28～11

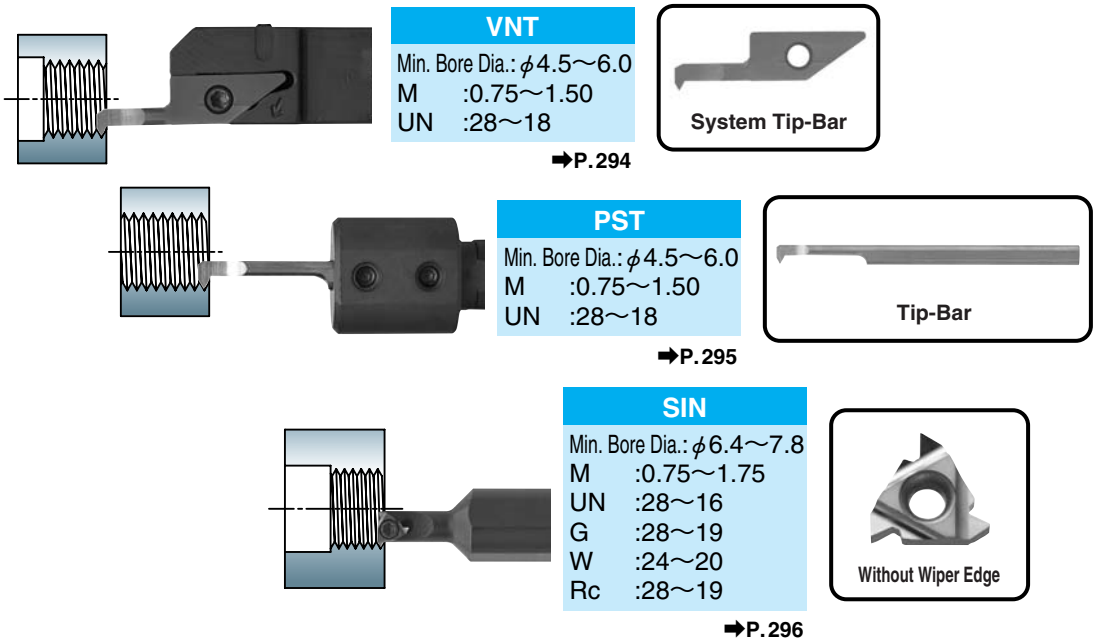
➡P.300

Female Thread

M	: Metric	(mm)
UN	: Unified	(TPI)
G	: Parallel Pipe	(TPI)
W	: Whitworth	(TPI)
Rc	: Tapered Pipe	(TPI)
NPT	: American National Pipe	(TPI)
Tr	: 30° Trapezoidal	(mm)

■ Small Dia Internal Threading ϕ4.5～

System Tip-Bar & Tip-Bar Small Shank



VNT
Min. Bore Dia.: ϕ4.5～6.0
M :0.75～1.50
UN :28～18

➡P.294

System Tip-Bar

PST
Min. Bore Dia.: ϕ4.5～6.0
M :0.75～1.50
UN :28～18

➡P.295

Tip-Bar

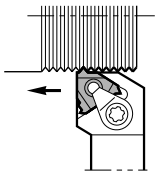
SIN
Min. Bore Dia.: ϕ6.4～7.8
M :0.75～1.75
UN :28～16
G :28～19
W :24～20
Rc :28～19

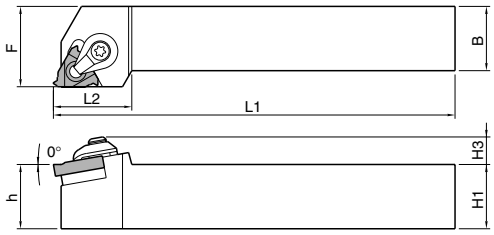
➡P.296

Without Wiper Edge

External Threading Toolholders [TNN Insert]

■ KTN

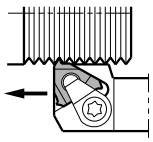


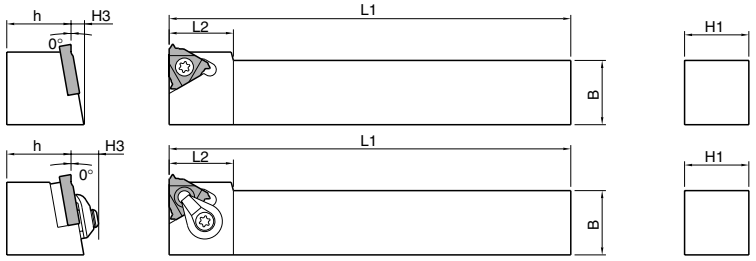


● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

■ KTNS (For Gang type NC Lathe)

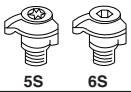
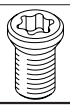
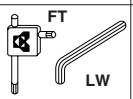
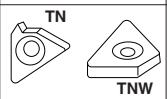
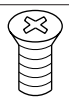




● Right-hand Shown

R-hand Insert for R-hand Toolholder

● Toolholder Dimension

Description		Stock		Dimension (mm)						Spare Parts				
										Clamp Set	Clamp Screw	Wrench	Shim	Shim Screw
		R	L	H1=h	H3	B	L1	L2	F	 5S 6S		 FT LW	 TN TNW	
KTN R/L	1616H-16	●	○	16	8.5	16	100	25	20	CPS-5S	-	FT-15	TN-32 (TNW-32)	SP3X8
	2020K-16	●	●	20	8.5	20	125	25	25					
	2525M-16	●	●	25	8.5	25	150	25	30					
	2525M-22	●		25	10	25	150	29	32	CPS-6S	-	LW-3	TN-43	SP3X8
	3225P-22	●		32	10	25	170	34	32					
KTNS R/L	1010H-16	●		10	8.5	10	100	16	16	-	SB-3.5TR	FT-15	-	-
	1212K-16	●		12	8.5	12	125	18	18					
	1616K-16	●		16	8.5	16	125	18	22	CPS-5S	-	FT-15	TN-32 (TNW-32)	SP3X8
	2020K-16	○		20	8.5	20	125	20	25					

· Shim: When using 2-Thread Insert such as TNN32ER100M02, Prepare TNW-32 separately.

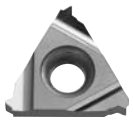
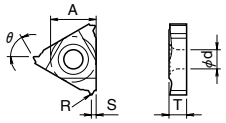
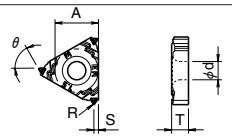
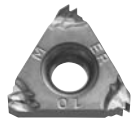
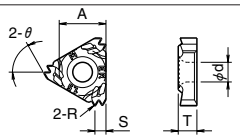
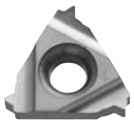
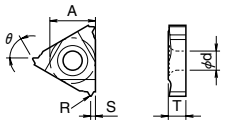
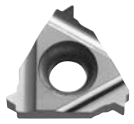
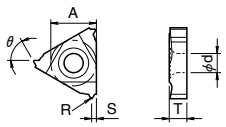
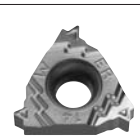
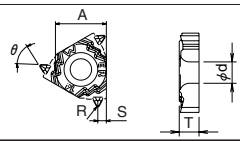
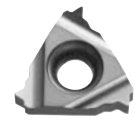
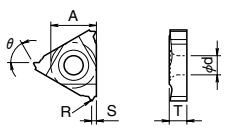
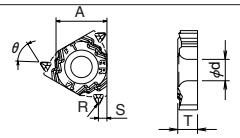
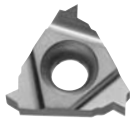
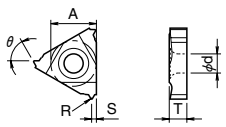
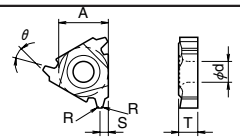
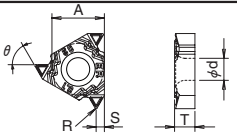
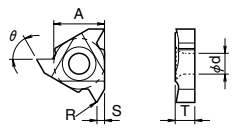
● Applicable Insert

Toolholder	Insert			
	With Wiper Edge	With Wiper Edge (1-Thread, With Chipbreaker)	With Wiper Edge (2-Thread, With Chipbreaker)	Without Wiper Edge
KTN R/L····16	TNN32E R/L○○○M TNN32E R/L○○UN TNN32E R/L○○W TNN32E R/L○○PT TNN32E R/L○○NPT	TNN32E R/L○○○M-TS TNN32E R/L○○○○-TS TNN32E R/L○○W-TS TNN32E R/L○○PT-TS	TNN32E R/L○○○M02	TNN32E R/L○○○○ TNN32E R/L○○○TR
KTN R/L····22	TNN43E R/L○○○M TNN43E R/L○○UN	-	-	TNN43E R/L○○○TR
KTNS R/L····16	TNN32E R/L○○○M TNN32E R/L○○UN TNN32E R/L○○W TNN32E R/L○○PT TNN32E R/L○○NPT	TNN32E R/L○○○M-TS TNN32E R/L○○○○-TS TNN32E R/L○○W-TS TNN32E R/L○○PT-TS	TNN32E R/L○○○M02	TNN32E R/L○○○○ TNN32E R/L○○○TR

Depth of Cut & Number of Pass ➡ P.308~P.310
Recommended Cutting Conditions ➡ P.314

●: Std. Stock ○: Check Availability

● Applicable Insert

Shape (Right-hand Shown)	Description	Applicable Thread	Pitch mm TPI	A	T	ϕd	R	S	θ	Insert Grade: Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TNN32E R/L 050M	M	0.50	9.525	3.68	4.0	0.06	0.40	60°		R	R		R	
	TNN32E R/L 075M	M	0.75	9.525	3.68	4.0	0.09	0.53	60°		R	R		R	
	TNN32E R/L 100M	M	1.00	9.525	3.68	4.0	0.12	0.80	60°	R	R	R		●	R
	TNN32E R/L 125M	M	1.25	9.525	3.68	4.0	0.15	0.90	60°	R	R	R		●	
	TNN32E R/L 150M	M	1.50	9.525	3.68	4.0	0.19	1.00	60°	R	R	R		●	R
	TNN32E R/L 175M	M	1.75	9.525	3.68	4.0	0.22	1.50	60°	R	R	R		R	
	TNN32E R/L 200M	M	2.00	9.525	3.68	4.0	0.25	1.50	60°	R	R	R		●	R
	TNN32E R/L 250M	M	2.50	9.525	3.68	4.0	0.32	1.60	60°	R	R	R		R	
	TNN43E R/L 300M	M	3.00	12.70	4.90	4.85	0.41	2.10	60°		R	R		R	
	TNN43E R/L 350M	M	3.50	12.70	4.90	4.85	0.48	2.10	60°		R	R		R	
	TNN43E R/L 400M	M	4.00	12.70	4.90	4.85	0.55	2.80	60°		R	R		R	
	TNN43E R/L 450M	M	4.50	12.70	4.90	4.85	0.62	2.80	60°		R	R		R	
	TNN43E R/L 500M	M	5.00	12.70	4.90	4.85	0.70	2.80	60°		R	R		R	
 	TNN32E R/L 100M-TS	M	1.00	9.525	3.68	4.0	0.12	0.8	60°			R	R	R	
	TNN32E R/L 125M-TS	M	1.25	9.525	3.68	4.0	0.15	0.9	60°				R	R	
	TNN32E R/L 150M-TS	M	1.50	9.525	3.68	4.0	0.19	1.0	60°			R	R	R	
	TNN32E R/L 200M-TS	M	2.00	9.525	3.68	4.0	0.25	1.5	60°			R	R	R	
 	TNN32E R/L 100M02	M	1.00	9.525	3.68	4.0	0.12	1.80	60°		R	R		R	
	TNN32E R/L 150M02	M	1.50	9.525	3.68	4.0	0.19	2.25	60°		R	R		R	
	TNN32E R/L 200M02	M	2.00	9.525	3.68	4.0	0.25	2.90	60°		R	R		R	
 	TNN32E R/L 24UN	UN	24	9.525	3.68	4.0	0.13	0.8	60°		R	R		R	
	TNN32E R/L 20UN	UN	20	9.525	3.68	4.0	0.16	1.0	60°		R	R		R	
	TNN32E R/L 18UN	UN	18	9.525	3.68	4.0	0.18	1.0	60°		R	R		R	
	TNN32E R/L 16UN	UN	16	9.525	3.68	4.0	0.20	1.1	60°		R	R		R	
	TNN32E R/L 14UN	UN	14	9.525	3.68	4.0	0.23	1.5	60°		R	R		R	
	TNN32E R/L 12UN	UN	12	9.525	3.68	4.0	0.27	1.5	60°		R	R		R	
	TNN43E R/L 08UN	UN	8	12.70	4.90	4.85	0.43	2.1	60°		R	R		R	
 	TNN32E R/L 19W	G W	19 -	9.525	3.68	4.0	0.16	1.0	55°	R	R	R		R	
	TNN32E R/L 14W	G W	14 14	9.525	3.68	4.0	0.23	1.5	55°	R	R	R		R	
	TNN32E R/L 11W	G W	11 11	9.525	3.68	4.0	0.30	1.5	55°	R	R	R		R	
 	TNN32E R/L 19W-TS	G W	19 -	9.525	3.68	4.0	0.16	1.0	55°			R	R	R	
	TNN32E R/L 14W-TS	G W	14 14	9.525	3.68	4.0	0.23	1.5	55°			R	R	R	
	TNN32E R/L 11W-TS	G W	11 11	9.525	3.68	4.0	0.30	1.5	55°			R	R	R	
 	TNN32E R/L 28PT	R	28	9.525	3.68	4.0	0.10	0.8	55°		R	R		R	
	TNN32E R/L 19PT	R	19	9.525	3.68	4.0	0.16	1.0	55°		R	R		R	R
	TNN32E R/L 14PT	R	14	9.525	3.68	4.0	0.22	1.6	55°		R	R		R	R
	TNN32E R/L 11PT	R	11	9.525	3.68	4.0	0.29	1.6	55°		R	R		R	R
 	TNN32E R/L 19PT-TS	R	19	9.525	3.68	4.0	0.16	1.0	55°			R	R	R	
	TNN32E R/L 14PT-TS	R	14	9.525	3.68	4.0	0.22	1.6	55°			R	R	R	
	TNN32E R/L 11PT-TS	R	11	9.525	3.68	4.0	0.29	1.6	55°			R	R	R	
 	TNN32E R/L 18NPT	NPT	18	9.525	3.68	4.0	0.04	0.9	60°		R	R		R	
	TNN32E R/L 14NPT	NPT	14	9.525	3.68	4.0	0.05	1.5	60°		R	R		R	
	TNN32E R/L 11.5NPT	NPT	11.5	9.525	3.68	4.0	0.06	1.5	60°		R	R		R	
 	TNN32E R/L 200TR	Tr	2.0	9.525	3.68	4.0	0.20	1.6	30°		R	R		R	
	TNN32E R/L 300TR	Tr	3.0	9.525	3.68	4.0	0.20	1.6	30°		R	R		R	
	TNN43E R/L 400TR	Tr	4.0	12.70	4.90	4.85	0.20	2.5	30°		R	R		R	
	TNN43E R/L 500TR	Tr	5.0	12.70	4.90	4.85	0.20	2.5	30°		R	R		R	
 	TNN32E R/L 6001-TS	M	1.0~2.5	9.525	3.68	4.0	0.09	1.5	60°				R	R	
		UN	24~11	9.525	3.68	4.0	0.09	1.5	60°				R	R	
	TNN32E R/L 6002-TS	M	1.5~2.5	9.525	3.68	4.0	0.19	1.5	60°				R	R	
		UN	16~11	9.525	3.68	4.0	0.19	1.5	60°				R	R	
 	TNN32E R/L 6001	M UN	1.0~2.5 24~11	9.525	3.68	4.0	0.10	1.5	60°	R	R	R		R	R
	TNN32E R/L 6002	M UN	1.5~2.5 16~11	9.525	3.68	4.0	0.20	1.5	60°	R	R	R		R	R
	TNN32E R/L 5501	G,R W	28~11 24~10	9.525	3.68	4.0	0.10	1.5	55°	R	R	R		R	R
	TNN32E R/L 5502	G,R W	14~11 16~9	9.525	3.68	4.0	0.20	1.5	55°	R	R	R		R	R

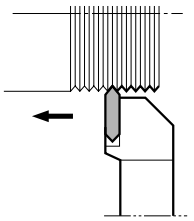
Applicable Thread: M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), R(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

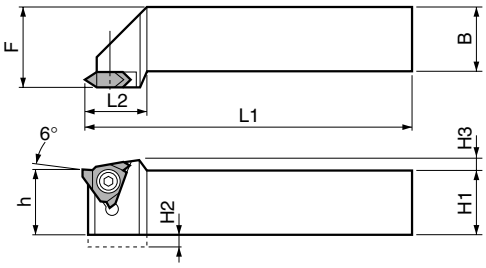
PR930 is containd in 5-pc Pack

●: Std. Stock ○: Check Availability R: R-hand Only

External Threading Toolholders [TT Insert]

■ KTT





● Right-hand Shown

R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

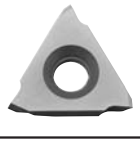
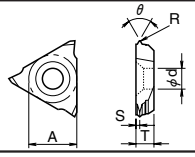
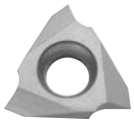
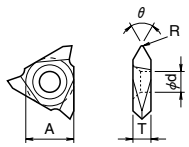
● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F	Spare Parts: Clamp Screw		Spare Parts: Wrench	
KTTR/L	1010F -16	○	○	10	4	2.5	10	80	18	12				
	1212H -16	○	○	12	2	2.5	12	100	18	16	GS-40TR	-	FT-10	-
	1616H -16	○	○	16	-	2.5	16	100	18	20				
	2020K -16	○	●	20	-	2.5	20	125	18	25	SB-4TR	-	FT-15	-
	2525M-16	●	○	25	-	2.5	25	150	18	30				
	2020K -22	○	○	20	-	3.0	20	125	25	25	-	GS-50	-	LW-3
	2525M-22	○	○	25	-	3.0	25	150	25	30				

● Applicable Insert

Toolholder	Insert: With Wiper Edge	Insert: Without Wiper Edge
KTTR/L····16	-	TT32R/L○○○○
KTTR/L····22	TT43ER/L○○○○M	TT43R/L○○○○

PR930 is containd in 5-pc Pack

Shape (Right-hand Shown)	Description		Applicable Thread	Pitch mm / TPI	A	T	φd	R	S	θ	Angle (°)	Insert Grade: Cermet TC30	Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TT43ER/L	100M	M	1.0	12.70	4.76	5.5	0.12	0.8	60°			R	R		R	
		125M		1.25				0.15	0.9				R	R		R	
		150M		1.5				0.19	1.0				R	R		R	
		200M		2.0				0.25	1.7				R	R		R	
 	TT32R/L	6000	M UN	0.5~2.5 56~10	9.525	3.18	4.5	0.0	-	60°		R	○			L	
		6001	M UN	1.0~2.5 24~10				0.1	-			R	○	○		L	○
		6002	M UN	1.5~2.5 16~10				0.2	-			R	○	○		○	○
		6003	M UN	2.5 11~10				0.3	-			R	○			R	
	TT43R/L	6001	M UN	1.0~3.5 24~8	12.70	4.76	5.5	0.1	-			R	○	○		○	○
		6002	M UN	1.5~3.5 16~8				0.2	-			R	○	○		○	○
		6003	M UN	2.5~3.5 11~8				0.3	-			R	○	○		○	
		6004	M UN	3.0~3.5 8				0.4	-			R	○	○		○	
	TT32R/L	5501	G,R W	28~11 24~10	9.525	3.18	4.5	0.1	-	55°			○			○	○
		5502	G,R W	14~11 16~11				0.2	-				○			○	○
	TT43R/L	5501	G,R W	28~11 24~7	12.70	4.76	5.5	0.1	-			R	○			R	○
		5502	G,R W	14~11 16~7				0.2	-			R	○			R	○
		5503	G,R W	11 11~7				0.3	-				○			R	
		5504	G,R W	- 8~7				0.4	-				○				

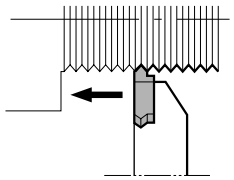
Applicable Thread	M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), R(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

Depth of Cut & Number of Pass ➡ P.309,P.310~312
Recommended Cutting Conditions ➡ P.314

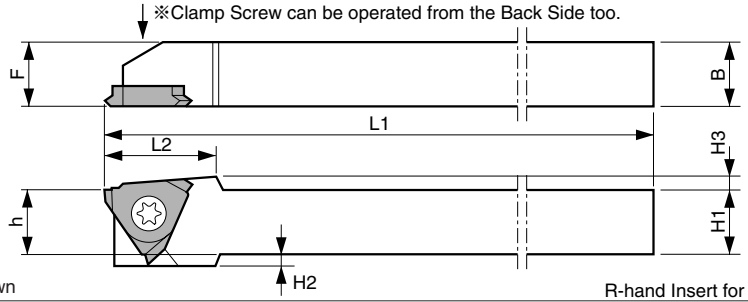
●: Std. Stock ○: Check Availability R: R-hand Only

External Threading Toolholders [TTX Insert]

■ KTTX



Available to Thread End



● Right-hand Shown

R-hand Insert for R-hand Toolholder

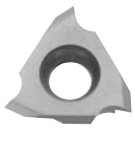
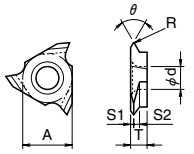
● Toolholder Dimension

Description		Stock R	Stock L	Dimension (mm) H1=h	H2	H3	B	L1	L2	F	Spare Parts: Clamp Screw	Spare Parts: Wrench
KTTXR/L	1010K-16F	●		10	2	2.5	10	125	17.6	10	SB-4070TRW	FT-8
	1212M-16F	●		12	-	2.5	12	150	17.6	12		
	1616M-16F	●		16	-	2.5	16	150	17.6	16		
	2020K-16F	●		20	-	2.5	20	125	17.6	20		

● Applicable Insert

Toolholder	Insert: Without Wiper Edge
KTTXR···-16	TTX32R○○○○
	TTX32R○○○○S

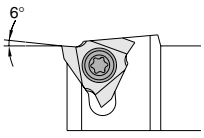
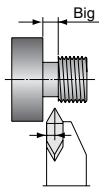
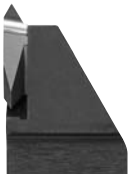
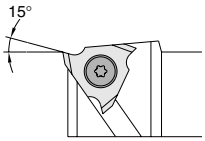
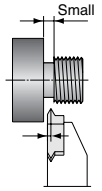
PR930 is containd in 5-pc Pack

Shape (Right-hand Shown)	Description	Applicable Thread	Pitch mm TPI	A	T	ϕd	R	S1	S2	Angle (°) θ	Insert Grade: Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TTX32R/L 6000	M	0.5~1.0	9.525	3.18	4.4	0.00	0.6	1.12	60°					R
		UN	56~32												
	60005	M	0.5~1.0				0.05	0.6	1.12		R	R		R	R
		UN	48~32												
	6001	M	1.0~2.0				0.10	1.1	1.62		R	R		R	R
		UN	28~14												
	TTX32R/L 6000S	M	0.5	9.525	3.18	4.4	0.00	0.3	1.12	60°		R		R	R
		UN	56~48												
	60005S	M	0.5				0.05	0.3	1.12			R		R	R
		UN	48												
	TTX32R/L 5501	G,R	28~19	9.525	3.18	4.4	0.10	0.75	1.01	55°	R			R	R
		W	24~20												
	55015	G,R	19~11				0.15	1.20	1.46		R			R	R
		W	20~11												

Applicable Thread	M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), R(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

Depth of Cut & Number of Pass P.312
Recommended Cutting Conditions P.314

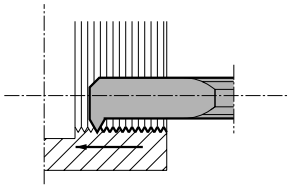
◆ TT type and TTX type

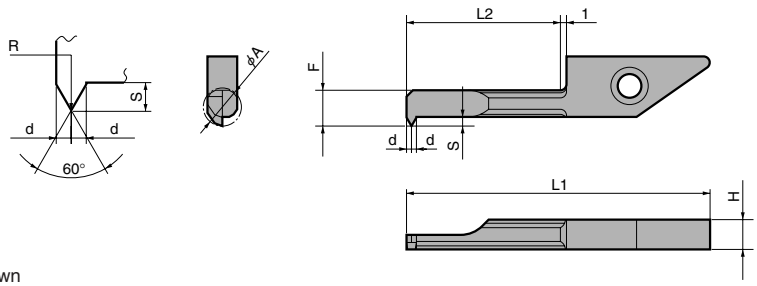
Type	Shape	Feature: Rake Angle after Installment	Feature: Condition	Feature: Dead Space
TT			· One Insert can cope with various Pitch Sizes.	
TTX			· The Least Cutting Resistance · One Insert can cope with various Pitch Sizes, but Less than TT.	

●: Std. Stock ○: Check Availability R: R-hand Only

System Tip-Bar for Micro Internal Threading [Solid]

■ VNT





● Right-hand Shown

● Toolholder Dimension

Description		Min. Bore Dia.	Dimension (mm)									Insert Grade				Applicable Thread			
												Cermet	PVD Coated		Carbide	Metric		Unified	
		φA	H	L1	L2	F	S	d	R			TC60	PR630	PR930	KW10	Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)
VNT R/L	045-11	4.5	3.9	30.8	11	3.6	1.3	0.6	0.05					R	R	over M6	P0.75 ~P1.25	over 1/4-20UNC, 1/4-28UNF	28~20
	060-11	6.0	3.9	30.8	11	4.6	1.6	0.8	0.05					R	R	over M8	P0.75 ~P1.50	over 5/16-18UNC, 5/16-24UNF	24~18

● See Page.156-157 for the Applicable Toolholder.

System Tip-Bar is contained in 5-pc Pack

◆ Depth of Cut & Number of Pass

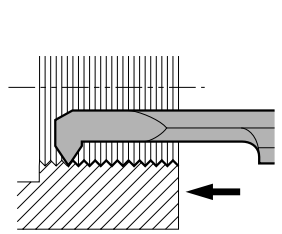
Pitch (mm)	Total D.O.C. (mm)	No. of Pass	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass
0.75	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
1.00	0.60	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03					
1.25	0.76	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03			
1.50	0.92	17	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03

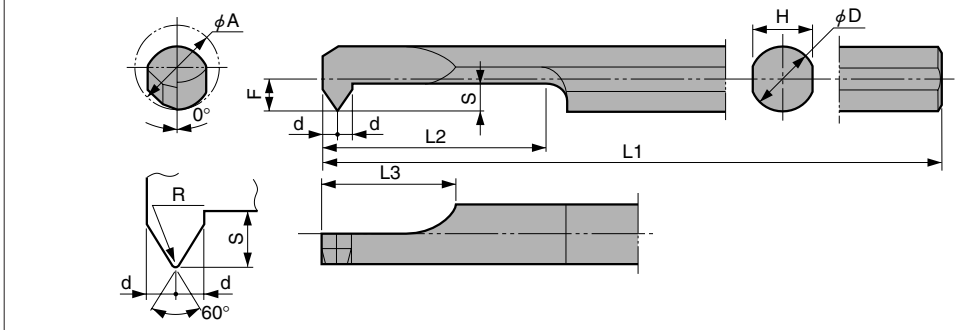
Caution 1)The Standard Cutting Speed is 30 - 50m/min. Under the Small Dia. and High Revolution Situation, the Table Feed may not follow the Expected Conditions depending on the Machine.
2)Wet cutting is recommended.

R: R-hand Only

Tip-Bar for Micro Internal Threading [Solid]

■ PST-S





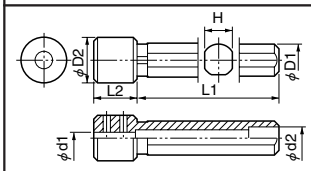
● Right-hand Shown

● Toolholder Dimension

Description		Min. Bore Dia.	Dimension (mm)									Insert Grade				Applicable Thread			
												Cermet	PVD Coated		Carbide	Metric		Unified	
		φA	φD	H	L1	L2	L3	F	S	d	R	TC60	PR630	PR930	KW10	Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)
PST R/L	0604-60S	4.5	3.8	3.6	60	15	8	1.7	1.6	0.8	0.05				R	over M6	P0.75 ~P1.25	over 1/4-20UNC, 1/4-28UNF	28~20
	0805-70S	6.0	4.8	4.4	70	20	8	2.2	2.1	1.0	0.05				R	over M8	P0.75 ~P1.50	over 5/16-18UNC, 5/16-24UNF	24~18

Tip-Bar is contained in 1-pc Pack

● Applicable Sleeve

Shape	Description	(Old Description)	Stock	Dimension (mm)							Spare Parts		Applicable Tip-Bar
				φD1	φD2	φd1	φd2	H	L1	L2	Screw	Wrench	
	PH 0412-60	PH -0412	●	12	19	3.8	6	11	60	20	HS4X4	LW-2	PST R/L 0604-60S
	0512-60	-0512	●			4.8							PST R/L 0805-70S
	PH 0416-80	PH -0416	●	16	22	3.8	Rp1/4 (PS1/4)	14	80	20	HS4X4	LW-2	PST R/L 0604-60S
	0516-80	-0516	●			4.8							PST R/L 0805-70S

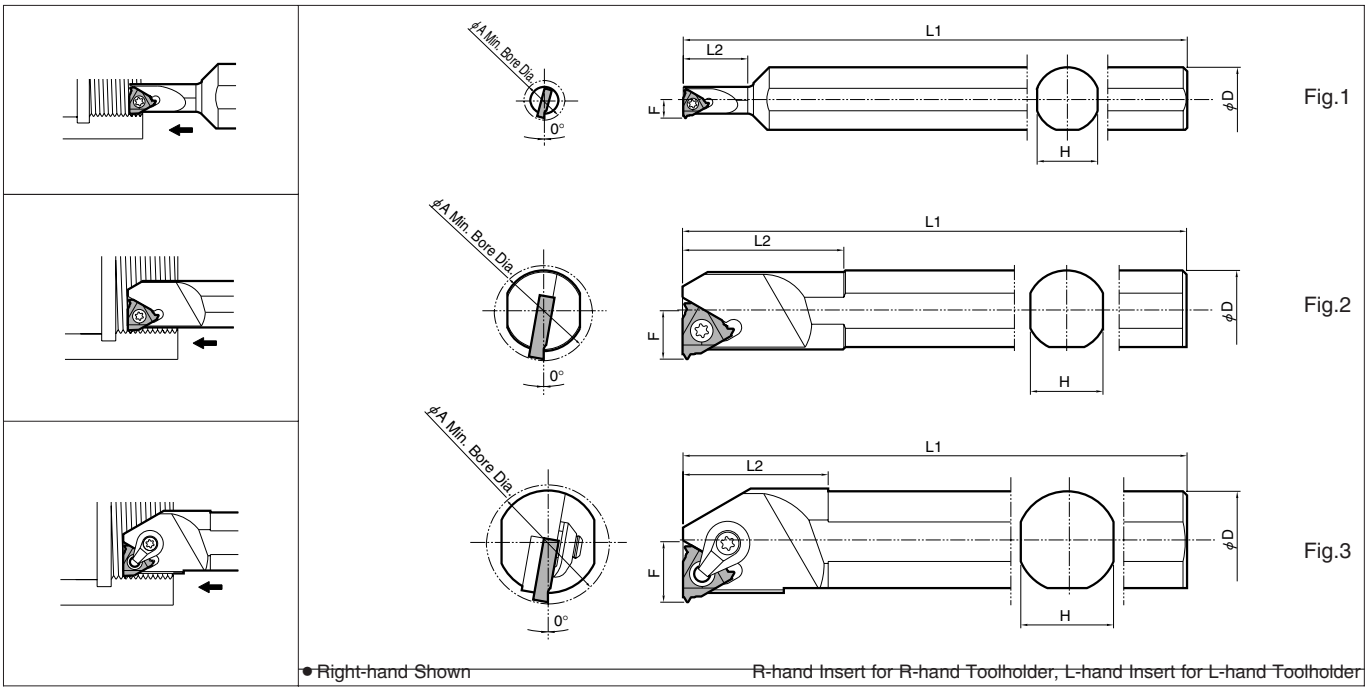
◆ Depth of Cut & Number of Pass

Pitch (mm)	Total D.O.C. (mm)	No. of Pass	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass
0.75	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
1.00	0.60	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03					
1.25	0.76	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03			
1.50	0.92	17	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03

Caution 1)The Standard Cutting Speed is 30 - 50m/min. Under the Small Dia. and High Revolution Situation, the Table Feed may not follow the Expected Conditions depending on the Machine.
2)Wet cutting is recommended.

Internal Threading Toolholders [TNN Insert]

■ SIN · CIN



● Right-hand Shown　　R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder

● Toolholder Dimension

Description		Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	Shape	Spare Parts: Clamp Screw	Clamp Set	Wrench	Shim	Shim Screw
SINR/L	0612S-06E	●		6.4	12	11	100	10	3.8	Fig.1	SB-2040TR	-	FT-6	-	-
	0816S-08E	●		7.8	16	15	125	16	4.0		SB-2050TR	-	FT-6	-	-
	1216S-11E	●	○	12	16	14	150	25	6.3	Fig.2	SB-2TR	-	FT-8	-	-
	1516S-11	●	○	15	16	14	150	30	7.5						
	2016S-16	●	○	20	16	14	150	37	10.0		SB-3.5TR	-	FT-15	-	-
	2420S-16	●	○	24	20	18	180	40	12.0						
	2420S-22	●		24	20	18	180	40	12.0		SB-4085TR	-	FT-15	-	-
CINR/L	3025S-16	●	●	30	25	23	200	36	15.0	Fig.3	-	CPS-5S	FT-15	TN-32	SP3X8
	3732S-16	●		37	32	30	250	45	18.5						
	3025S-22	●		30	25	23	200	40	15.0		-	CPS-6S	LW-3	TN-43	SP3X8
	3732S-22	●		37	32	30	250	45	18.5						

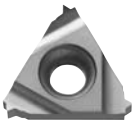
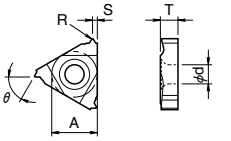
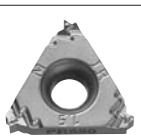
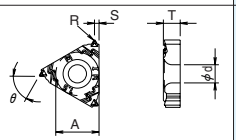
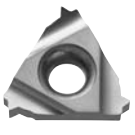
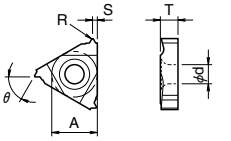
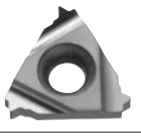
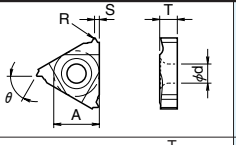
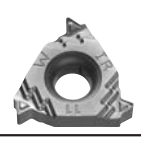
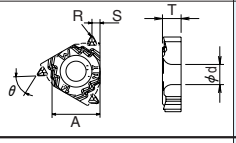
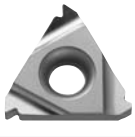
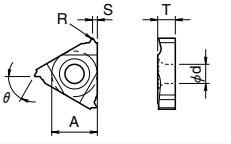
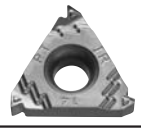
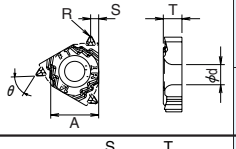
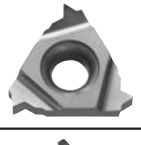
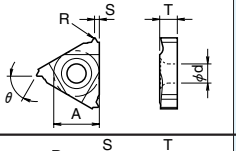
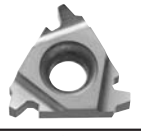
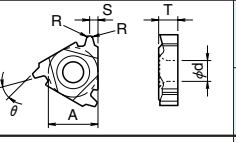
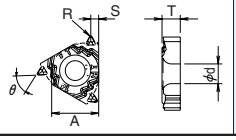
● Applicable Insert

Toolholder	Insert: With Wiper Edge	With Wiper Edge (1-Thread, With Chipbreaker)	Without Wiper Edge
SINR····06E	-	-	TNN06IR○○○○
SINR····08E	-	-	TNN08IR○○○○
SINR/L····11E SINR/L····11	TNN22IR/L○○○M TNN22IR/L○○PT	TNN22IR/L○○PT-TS	TNN22IR/L○○○○
SINR/L····16 CINR/L····16	TNN32IR/L○○○M TNN32IR/L○○UN TNN32IR/L○○W TNN32IR/L○○PT TNN32IR/L○○NPT	TNN32IR/L○○○M-TS TNN32IR/L○○○○-TS TNN32IR/L○○W-TS TNN32IR/L○○PT-TS	TNN32IR/L○○○○○ TNN32IR/L○○○TR
SINR/L····22 CINR/L····22	TNN43IR/L○○○M TNN43IR/L○○UN	-	TNN43IR/L○○○TR

Depth of Cut & Number of Pass ➡ P.308～P.310
Recommended Cutting Conditions ➡ P.314

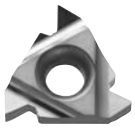
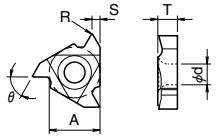
● See page 302～305 for the applicable Toolholders & Inserts.

●: Std. Stock ○: Check Availability

Shape (Right-hand Shown)	Description	Applicable Thread	Pitch mm TPI	Dimension (mm) A	T	ϕd	R	S	Angle (°) θ	Insert Grade: Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TNN22I℞ 050M	M	0.50	6.35	3.18	3.0	0.03	0.55	60°		R	R		R	
	075M		0.75				0.05	0.68			R	R		R	
	100M		1.00				0.07	0.80		R	R	R		●	R
	125M		1.25				0.08	1.1			R	○		R	
	150M		1.50				0.10	1.1		R	R	R		●	R
	175M		1.75				0.12	1.1			R	○		R	
	200M		2.00				0.14	0.9				R		R	
	TNN32I℞ 100M	M	1.00	9.525	3.68	4.0	0.07	0.8		R	R	R		R	R
	125M		1.25				0.08	1.1			R	○		R	
	150M		1.50				0.10	1.1		R	R	○		●	R
	175M		1.75				0.12	1.1			R	R		R	
	200M		2.00				0.14	1.5		R	R	R		●	R
	250M		2.50				0.16	1.5			R	R		R	
	TNN43I℞ 300M	M	3.00	12.70	4.90	4.85	0.19	1.8			R	R		R	
	350M		3.50				0.23	2.1			R	R		R	
	400M		4.00				0.26	2.8			R	R		R	
	450M		4.50				0.30	2.8			R	R		R	
	500M		5.00				0.34	2.8			R	R		R	
 	TNN32I℞ 100M-TS	M	1.00	9.525	3.68	4.0	0.07	0.8	60°			R	R	R	
	150M-TS		1.50				0.10	1.1				R	R	R	
	200M-TS		2.00				0.14	1.5				R	R	R	
 	TNN32I℞ 24UN	UN	24	9.525	3.68	4.0	0.05	0.8	60°		R	R		R	
	20UN		20				0.07	1.0			R	R		R	
	18UN		18				0.09	1.0			R	R		R	
	16UN		16				0.10	1.1			R	R		R	
	14UN		14				0.12	1.5			R	R		R	
	12UN		12				0.14	1.5			R	R		R	
	TNN43I℞ 08UN	UN	8	12.70	4.90	4.85	0.20	1.8			R	R		R	
 	TNN32I℞ 14W	G W	14 14	9.525	3.68	4.0	0.23	1.5	55°	R	R	R		R	
	11W	G W	11 11				0.30	1.5		R	R	R		R	
 	TNN32I℞ 14W-TS	G W	14 14	9.525	3.68	4.0	0.23	1.5	55°			R	R	R	
	11W-TS	G W	11 11				0.30	1.5				R	R	R	
 	TNN22I℞ 28PT	Rc	28	6.35	3.18	3.0	0.10	0.60	55°		R	R		R	
	19PT		19				0.16	0.78			R	○		R	R
	14PT		14				0.22	0.97			R	○		R	R
	TNN32I℞ 14PT	Rc	14	9.525	3.68	4.0	0.22	0.97			R	R		R	R
	11PT		11				0.29	1.50			R	R		R	R
 	TNN22I℞ 19PT-TS	Rc	19	6.35	3.18	3.0	0.26	0.78	55°			R	R	R	
	14PT-TS		14				0.22	0.97				R	R	R	
	TNN32I℞ 14PT-TS	Rc	14	9.525	3.68	4.0	0.22	0.97				R	R	R	
	11PT-TS		11				0.29	1.50				R	R	R	
 	TNN32I℞ 18NPT	NPT	18	9.525	3.68	4.0	0.04	0.9	60°		R	R		R	
	14NPT		14				0.05	1.5			R	R		R	
	11.5NPT		11.5				0.06	1.5			R	R		R	
 	TNN32I℞ 200TR	Tr	2.00	9.525	3.68	4.0	0.20	1.6	30°		R	R		R	
	300TR		3.00								R	R		R	
	TNN43I℞ 400TR	Tr	4.00	12.70	4.90	4.85	0.20	2.5			R	R		R	
	500TR		5.00								R	R		R	
 	TNN32I℞ 6001-TS	M UN	1.5~2.5 16~10	9.525	3.68	4.0	0.09	1.5	60°				R	R	
	60015-TS	M UN	2.5 11~10				0.19	1.5					R	R	

●: Std. Stock ○: Check Availability R: R-hand Only

Internal Threading Toolholders [TNN Insert]

Shape (Right-hand Shown)	Description	Applicable Thread	Pitch mm TPI	A	T	ϕd	R	S	Angle (°) θ	Insert Grade: Cermet TC40	Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TNN06IR/L 60005	M UN	0.75~1.25 28~20	3.97	1.91	2.3	0.05	0.6	60°					R	
	TNN08IR/L 60007	M UN	1.0~1.75 20~16	4.76	2.38	2.3	0.07	0.8						R	
	TNN22IR/L 60005	M UN	0.75~1.5 32~16	6.35	3.18	3.0	0.05	1.0			R	○		●	R
	TNN32IR/L 6001	M UN	1.5~2.5 16~10	9.525	3.68	4.0	0.10	1.5		R	R	R		R	R
	60015	M UN	2.5 11~10				0.15	1.5		R	R	R		R	R
	TNN06IR/L 5501	G,Rc W	28 24	3.97	1.91	2.3	0.10	0.6	55°					R	
	TNN08IR/L 5501	G,Rc W	28~19 24~20	4.76	2.38	2.3	0.10	0.8						R	
	TNN22IR/L 55005	G,Rc W	28~14 24~14	6.35	3.18	3.0	0.05	1.1			R	○		R	R
	TNN32IR/L 5501	G,Rc W	28~11 24~11	9.525	3.68	4.0	0.10	1.5		R	R	R		R	R
	5502	G,Rc W	14~11 16~11				0.20	1.5		R	R	R		R	R

Applicable Thread	M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), Rc(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

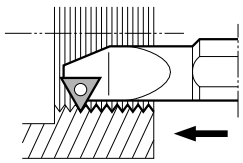
PR930 is containd in 5-pc Pack

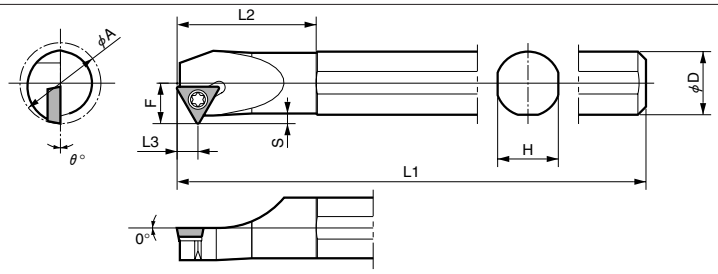
· No Wiper Effect is expected When threading the Female Screw using TNN32R/L○○W Insert.

●: Std. Stock ○: Check Availability R: R-hand Only

Internal Threading Toolholders [TPGB Insert]

S···STWP Steel Bar

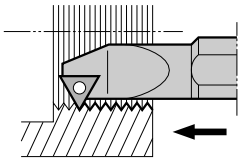


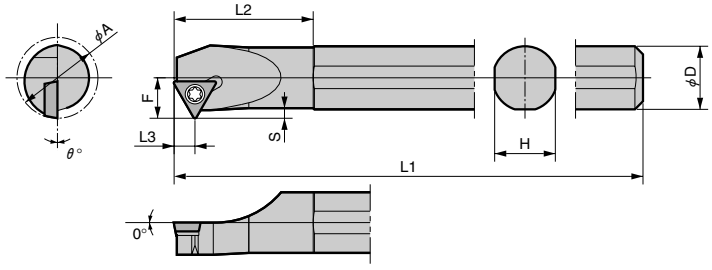


● Right-hand Shown

This Tool can be used as a Boring Bar too.

S···STWP-E Excellent Bar





● Right-hand Shown

This Tool can be used as a Boring Bar too.

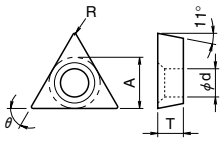
● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	Applicable Pitch (mm)	Spare Parts: Clamp Screw	Spare Parts: Wrench
S10M-STWPR/L11-12	SITR/L 1210-11	●		12	10	9.2	150	23	5.5	6	1.0	under 1.5	SB-3STR	FT-10
S12M-STWPR/L11-16	1612-11	●		16	12	11	150	30	5.5	8	1.5	under 2.0		
S16Q-STWPR/L11-20	2016-11	●		20	16	15	180	35	5.5	10	2.0	under 3.0	SB-3TR	
S20R-STWPR/L11-25	2520-11	●		25	20	19	200	40	5.5	12.5	2.5	under 3.5		
S10M-STWPR/L11-12E	-	○	○	12	10	9.2	150	23	5.5	6	1.0	under 1.5	SB-3STR	FT-10
S12M-STWPR/L11-16E		○	○	16	12	11	150	30	5.5	8	1.5	under 2.0		
S16R-STWPR/L11-20E		○	○	20	16	15	200	35	5.5	10	2.0	under 3.0	SB-3TR	
S20X-STWPR/L11-25E		○	○	25	20	19	220	40	5.5	12.5	2.5	under 3.5		

· S Dimension shows the Max. available *ap*

● Applicable Insert

Toolholder	Insert: Without Wiper Edge
···STWPR/L11-12(E)	TPGB1102○○(○)
···STWPR/L11-16(E)	TPGB1103○○(○)
···STWPR/L11-20(E)	
···STWPR/L11-25(E)	

Shape	Description	Applicable Thread	Pitch (mm / TPI)	A	T	φd	R	Angle (°) θ	Insert Grade: Cermet TN6020	Cermet TN30	Cermet TN60	PVD Cermet PV7020	PVD Cermet PV60	Carbide KW10
 	TPGB 1102005	M UN	0.75~1.5 28~16	6.35	2.38	3.5	0.05	60°			○			○
	110201	M UN	1.5 16				0.10				●			○
	TPGB 1103005	M UN	0.75~3.5 28~11	6.35	3.18	3.3	0.05				○		○	○
	110301	M UN	1.5~3.5 16~8				0.10				●		○	○
	110302	M UN	3.0~3.5 8				0.20		●	○	●	○	○	○

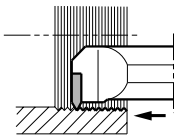
Applicable Thread	M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), Rc(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

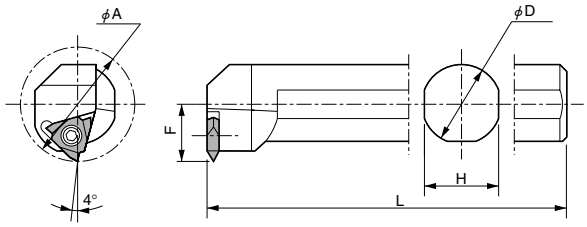
Depth of Cut & Number of Pass ➡ P.313
Recommended Cutting Conditions ➡ P.314

●: Std. Stock ○: Check Availability

Internal Threading Toolholders [TT Insert]

■ KITG





● Right-hand Shown

L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

● Toolholder Dimension

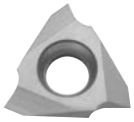
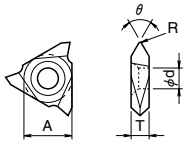
Description		Stock R	Stock L	Min. Bore Dia. ϕA	Dimension (mm) ϕD	H	L	F	Spare Parts: Clamp Screw		Wrench	
KITG R/L	3525T-16	○	○	35	25	23	220	17.5	SB-4TR	-	FT-15	-
	4532T-22	●	○	45	32	30	250	22.5	-	GS-50	-	LW-3

· Max. available Pitch: KITG R/L 3525T-16···P2.5 or 10TPI, KITG R/L 4532T-22···P3.0 or 8TPI.

● Applicable Insert

Toolholder	Insert: Without Wiper Edge
KITG R/L····-16	TT32 R/L ○○○○
KITG R/L····-22	TT43 R/L ○○○○

PR930 is contain in 5-pc Pack

Shape (Right-hand Shown)	Description		Applicable Thread	Pitch mm TPI	Dimension (mm) A	T	ϕd	R	Angle (°) θ	Insert Grade: Cermet TC30	Cermet TC60	PVD Coated PR630	PVD Coated PR660	PVD Coated PR930	Carbide KW10
 	TT32 R/L	6000	M UN	0.5~2.5 48~10	9.525	3.18	4.5	0.0	60°	R	○			L	
		6001	M UN	1.5~2.5 16~10				0.1		R	○	○		L	○
	TT43 R/L	6001	M UN	1.5~3.0 16~8	12.70	4.76	5.5	0.1		R	○	○		○	○
		6002	M UN	3.0 8				0.2		R	○	○		○	○
	TT32 R/L	5501	G,Rc W	28~11 24~10	9.525	3.18	4.5	0.1	55°		○			○	○
		5502	G,Rc W	14~11 16~10				0.2			○			○	○
	TT43 R/L	5501	G,Rc W	28~11 24~8	12.70	4.76	5.5	0.1			○			R	○
		5502	G,Rc W	14~11 16~8				0.2		R	○			R	○
		5503	G,Rc W	11 11~8				0.3			○			R	
		5504	G,Rc W	- 8				0.4			○				

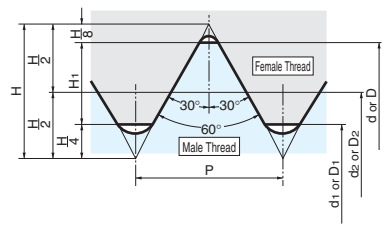
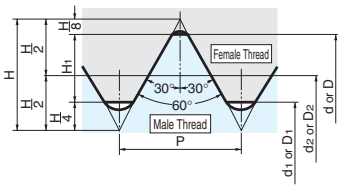
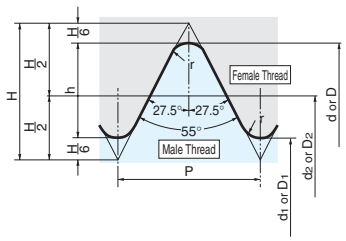
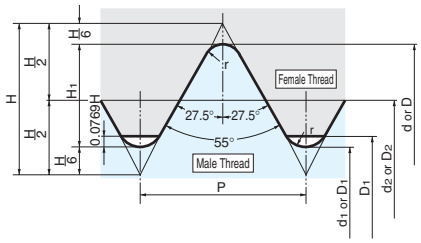
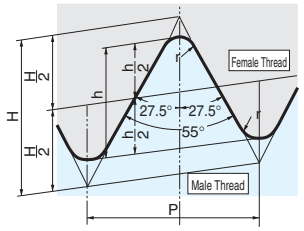
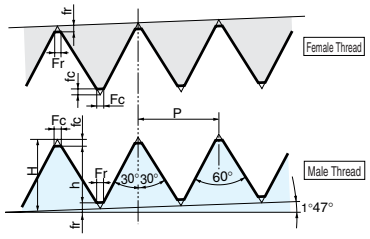
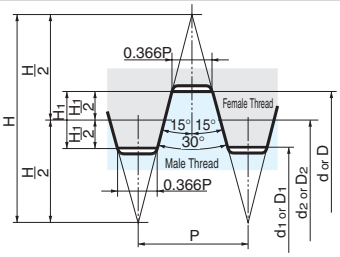
Applicable Thread	M: Metric, UN: Unified, G(PF): Parallel Pipe (W: Whitworth), Rc(PT): Tapered Pipe, NPT: American National Pipe, Tr: 30° Trapezoidal

Depth of Cut & Number of Pass ➡ P.311~312
Recommended Cutting Conditions ➡ P.314

●: Std. Stock

Thread Types & Basic Profile

■ Thread Types & Basic Profile / Applicable Toolholders & Inserts

	Basic Profile	Symbol (Old Symbol)		Applicable Insert	Applicable Toolholder
Metric		**M** e.g.) M30	Male Thread	TNN○○E[R/L]○○○M TNN32E[R/L]○○○M-TS TNN32E[R/L]○○○M02 TNN32E[R/L]60○○(-TS)	KTN[R/L]○○○○□-○○ KTNSR○○○○□-16
				TT43E[R/L]○○○M TT○○[R/L]60○○	KTT[R/L]○○○○□-○○
				TTX32[R/L]60○○	KTTX[R/L]○○○○□-16F
			Female Thread	TNN○○I[R/L]○○○M TNN○○I[R/L]○○○M-TS TNN○○I[R/L]60○○(○)(-TS)	SIN[R/L]○○○○S-○○(E) CIN[R/L]○○○○S-○○
				TT○○1/8R60○○	KITG[R/L]○○○○T-○○
				TPGB11○○○○(○)	S○○□-STWP[R/L]11-○○(E)
Unified		**UN** **UNC** **UNF** **UNEF** e.g.) 3/4-16 UNF	Male Thread	TNN○○E[R/L]○○○UN TNN32E[R/L]60○○(-TS)	KTN[R/L]○○○○□-○○ KTNS[R/L]○○○○□-16
				TT○○[R/L]60○○	KTT[R/L]○○○○□-○○
				TTX32[R/L]60○○	KTTX[R/L]○○○○□-16F
			Female Thread	TNN○○I[R/L]○○○UN TNN○○I[R/L]60○○(○)(-TS)	SIN[R/L]○○○○S-○○(E) CIN[R/L]○○○○S-○○
				TT○○1/8R60○○	KITG[R/L]○○○○T-○○
				TPGB11○○○○(○)	S○○□-STWP[R/L]11-○○(E)
Parallel Pipe		Male Thread: **G(PF)** Female Thread: **G(PF)** **Rp(PS)** e.g.) G3/4(PF3/4)	Male Thread	TNN○○E[R/L]○○○W TNN32E[R/L]○○○W-TS TNN32E[R/L]55○○	KTN[R/L]○○○○□-○○ KTNSR○○○○□-16
				TT○○[R/L]55○○	KTT[R/L]○○○○□-○○
				TTX32[R/L]55○○	KTTX[R/L]○○○○□-16F
			Female Thread	TNN○○I[R/L]○○○W TNN○○I[R/L]○○○W-TS TNN○○I[R/L]55○○(○)	SIN[R/L]○○○○S-○○(E) CIN[R/L]○○○○S-○○
				TT○○1/8R55○○	KITG[R/L]○○○○T-○○
Whitworth		**W** e.g.) W3/8	Male Thread	TNN○○E[R/L]○○○W TNN32E[R/L]○○○W-TS TNN32E[R/L]55○○	KTN[R/L]○○○○□-○○ KTNS[R/L]○○○○□-16
				TT○○[R/L]55○○	KTT[R/L]○○○○□-○○
				TTX32[R/L]55○○	KTTX[R/L]○○○○□-16F
			Female Thread	TNN○○I[R/L]○○○W TNN○○I[R/L]○○○W-TS TNN○○I[R/L]55○○(○○)	SIN[R/L]○○○○S-○○(E) CIN[R/L]○○○○S-○○
				TT○○1/8R55○○	KITG[R/L]○○○○T-○○
Tapered Pipe		Male Thread: **R(PT)** Female Thread: **Rc(PT)** e.g.) R1/2(PT1/2)	Male Thread	TNN○○E[R/L]○○○PT TNN32E[R/L]○○○PT-TS	KTN[R/L]○○○○□-○○ KTNS[R/L]○○○○□-16
				TT○○[R/L]55○○*	KTT[R/L]○○○○□-○○
				TTX32[R/L]55○○*	KTTX[R/L]○○○○□-16F
			Female Thread	TNN○○I[R/L]○○○PT TNN○○I[R/L]○○○PT-TS	SIN[R/L]○○○○S-○○(E) CIN[R/L]○○○○S-○○
				TT○○1/8R55○○*	KITG[R/L]○○○○T-○○
American National Pipe		**NPT** e.g.) 3/8-18 NPT	Male Thread	TNN○○E[R/L]○○○NPT	KTN[R/L]○○○○□-○○ KTNS[R/L]○○○○□-16
			Female Thread	TNN○○I[R/L]○○○NPT	SIN[R/L]○○○○S-○○ CIN[R/L]○○○○S-○○
30° Trapezoidal		**Tr** e.g.) Tr 26×3	Male Thread	TNN○○E[R/L]○○○Tr	KTN[R/L]○○○○□-○○ KTNS[R/L]○○○○□-16
			Female Thread	TNN○○I[R/L]○○○Tr	SIN[R/L]○○○○S-○○ CIN[R/L]○○○○S-○○

*···When the thread's roundishness can be ignored

●: Std. Stock ○: Check Availability R: R-hand Only

Applicable Toolholders & Inserts

The Standard Specification of the Inch Size Thread is based on the Dimension of 1/8 inch.

The Applicable Toolholders & Inserts Table of Page.302-305 is based on TNN type's Right-hand Tools.
For the Availability of other type's Tool and Left-hand Tool, See the Explanation Page respectively.

■ Parallel Pipe: G(PF),Rp (PS)

Nominal Thread Inch	Nominal Thread Symbol (Old Symbol)	TPI	Male Thread (G) Toolholder	Male Thread (G) Insert: Without Wiper Edge	Male Thread (G) Insert: With Wiper Edge	Female Thread (G,Rp) Toolholder	Female Thread (G,Rp) Insert: Without Wiper Edge	Female Thread (G,Rp) Insert: With Wiper Edge	Bore Dia.	Root's Radius Male/Female
-	G 1/16 (-)	28	KTNR○○○○□-16 KTNSR○○○○□-16	TNN32ER5501	-	SINR0612S-06E	TNN06IR5501	-	6.56	0.12
'1/8	G 1/8 (PF 1/8)								8.57	
'2/8	G 1/4 (PF 1/4)	19	KTNR○○○○□-16 KTNSR○○○○□-16	TNN32ER5501	TNN32ER19W TNN32ER19W-TS	SINR0816S-08E	TNN08IR5501	-	11.45	0.18
'3/8	G 3/8 (PF 3/8)					SINR1216S-11E	TNN22IR55005	-	14.95	
'4/8	G 1/2 (PF 1/2)	14	KTNR○○○○□-16 KTNSR○○○○□-16	TNN32ER5501 TNN32ER5502	TNN32ER14W TNN32ER14W-TS	SINR1516S-11	TNN22IR55005	-	18.63	0.25
'5/8	G 5/8 (PF 5/8)					SINR2016S-16	TNN32IR5501 TNN32IR5502	TNN32IR14W TNN32IR14W-TS	20.59	
'6/8	G 3/4 (PF 3/4)								24.12	
'7/8	G 7/8 (PF 7/8)					SINR2420S-16			27.88	
'8/8	G 1 (PF 1)	11	KTNR○○○○□-16 KTNSR○○○○□-16	TNN32ER5001 TNN32ER5502	TNN32ER11W TNN32ER11W-TS	SINR2420S-16	TNN32IR5501 TNN32IR5502	TNN32IR11W TNN32IR11W-TS	30.29	0.32
'9/8	G 1 1/8 (PF 1 1/8)					CINR3025S-16			34.94	
'10/8	G 1 1/4 (PF 1 1/4)					CINR3732S-16			38.95	
			Hereafter, all the threads are 11 TPI and the root's radius 0.32, the same tool for G1 1/4 can cope with them.							

■ Tapered Pipe: R,Rc (PT)

Nominal Thread Inch	Nominal Thread Symbol (Old Symbol)	TPI	Male Thread (R) Toolholder	Male Thread (R) Insert: Without Wiper Edge	Male Thread (R) Insert: With Wiper Edge	Female Thread (Rc) Toolholder	Female Thread (Rc) Insert: Without Wiper Edge	Female Thread (Rc) Insert: With Wiper Edge		Root's Radius Male/Female
-	R 1/16, Rc 1/16 (-)	28	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER28PT	SINR0612S-06E	TNN06IR5501	-		0.12
'1/8	R 1/8, Rc 1/8 (PT 1/8)									
'2/8	R 1/4, Rc 1/4 (PT 1/4)	19	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER19PT TNN32ER19PT-TS	SINR0816S-08E	TNN08IR5501	-		0.18
'3/8	R 3/8, Rc 3/8 (PT 3/8)					SINR1216S-11E	-	TNN22IR19PT TNN22IR19PT-TS		
'4/8	R 1/2, Rc 1/2 (PT 1/2)	14	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER14PT TNN32ER14PT-TS	SINR1516S-11	-	TNN22IR14PT TNN22IR14PT-TS		0.25
'6/8	R 3/4, Rc 3/4 (PT 3/4)					SINR2016S-16	-	TNN32IR14PT TNN32IR14PT-TS		
'8/8	R 1, Rc 1 (PT 1)	11	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER11PT TNN32ER11PT-TS	SINR2420S-16	-	TNN32IR11PT TNN32IR11PT-TS		0.32
'10/8	R 1 1/4, Rc 1 1/4 (PT 1 1/4)					CINR3025S-16				
'12/8	R 1 1/2, Rc 1 1/2 (PT 1 1/2)					CINR3732S-16				
			Hereafter, all the threads are 11 TPI and the root's radius 0.32, the same tool for R1 1/2 can cope with them.			Hereafter, all the threads are 11 TPI and the root's radius 0.32, the same tool for Rc1 1/2 can cope with them.				

※The largest Toolholder available for the Minimum Bore Dia. is recommended to the Female Threading in these Tables.
Then, the Toolholder whose min. Bore Dia. is smaller than the recommended Toolholder can be used to the threading too.
e.g.) SINR2420S-16 (Min. Bore Dia.:24mm) is recommended for the Tool of G7/8 Female Threading in the above Table, but SINR2016S-16 can be used too.

■ American National Pipe: NPT

Nominal Thread	TPI	Male Thread			Female Thread			
		Toolholder	Insert		Toolholder	Insert		
			Without Wiper Edge	With Wiper Edge		Without Wiper Edge	With Wiper Edge	
1/16 NPT 1/8 NPT	27	KTTR○○○○□-16 KTTXR○○○○□-16F	TT32R6000 TTX32R6000	-	No Tools Available			
1/4 NPT 3/8 NPT	18	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER18NPT	No Tools Available	-	-	
1/2 NPT 3/4 NPT	14	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER14NPT	No Tools Available	-	-	
					SINR2016S-16	-	TNN32IR14NPT	
1 NPT 1 1/4 NPT 1 1/2 NPT 2 NPT	11.5	KTNR○○○○□-16 KTNSR○○○○□-16	-	TNN32ER11.5NPT	SINR2420S-16	-	TNN32IR11.5NPT	
					CINR3025S-16			
					CINR3732S-16			

• Application to NPTF Thread
NPTF is the Thread to seal the the Pipe by interfering and deforming the Thread's Crest and Root deliberately, without using any sealing material.
Thread symbol is similar to NPT but the Tolerance is different from that of NPT and the above Inserts are not available to NPTF.

■ 30° Trapezoidal: Tr

The JIS Standard Trapezoidal Sizes to be machined by TNN Insert are shown.

Nominal Thread	Pitch (mm)	Male Thread			Female Thread			Bore Dia.
		Toolholder	Insert		Toolholder	Insert		
			Without Wiper Edge	With Wiper Edge		Without Wiper Edge	With Wiper Edge	
Tr 16X2	2	No Tools Available						14.00
Tr 18X2	2	KTNR○○○○□-16	TNN32ER200TR	-	No Tools Available	-	-	16.00
Tr 20X2	2	KTNSR○○○○□-16						18.00
Tr 22X3	3	KTNR○○○○□-16 KTNSR○○○○□-16	TNN32ER300TR	-	No Tools Available	-	-	19.00
Tr 24X3	3				SINR2016S-16	TNN32IR300TR	-	21.00
Tr 26X3	3							23.00
Tr 28X3	3				SINR2420S-16	TNN32IR300TR	-	25.00
Tr 30X3	3							27.00
Tr 32X3	3							29.00
Tr 34X3	3				CINR3025S-16	TNN32IR300TR	-	31.00
Tr 36X3	3							33.00
Tr 38X3	3							35.00
Tr 40X3	3							37.00
Tr 42X3	3				CINR3732S-16	TNN32IR300TR	-	39.00
Tr 44X3	3							41.00
Tr 46X3	3							43.00
Tr 48X3	3							45.00
Tr 50X3	3							47.00
Tr 52X3	3							49.00
Tr 55X3	3							52.00
Tr 60X3	3							57.00
Tr 65X3	3							62.00
Tr 70X4	4	KTNR○○○○□-22	TNN43ER400TR	-	CINR3732S-22	TNN43IR400TR	-	66.00
Tr 75X4	4							72.00
Tr 80X4	4							81.00
Tr 90X4	4							86.00
Tr 95X4	4							91.00
Tr 100X4	4							96.00
Tr 105X4	4							101.00
Tr 110X4	4							106.00

• TM Thread:
TM Thread of old JIS 30° Trapezoidal Thread was abolished already. But if the Nominal Dia. X Pitch is the same, the above Tr Thread insert can be used.
• TW Thread:
TW Thread is 29° Trapezoidal Thread and the above Inserts are not available.

Applicable Toolholders & Inserts (Female Thread)

Metric Coarse Thread: M

Nominal Thread	Pitch (mm)	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
M 1	0.25	No Tools Available	-	-	0.73
.					.
.					.
.					.
M3	0.5				2.46
M4	0.7				3.24
M5	0.8				4.13
M6	1.0	-	PSTR0604-60S / VNTR045-11		4.92
M7	1.0				5.92
M8	1.25	-	PSTR0805-70S / VNTR060-11		6.65
		SINR0612S-06E	TNN06IR60005		
M9	1.25	SINR0612S-06E	TNN06IR60005	-	7.65
M10	1.5	SINR0816S-08E	TNN08IR60007	-	8.38
M11	1.5				9.38
M12	1.75	SINR0816S-08E	TNN08IR60007	-	10.11
M16	2.0	No Tools Available			13.84
M18	2.5				15.29
M20	2.5				17.29
M22	2.5				19.29
M24	3.0				20.75
M27	3.0				23.75
M30	3.5	SINR2420S-22	-	TNN43IR350M	26.21
M33	3.5				29.21
M36	4.0	CINR3025S-22	-	TNN43IR400M	31.67
M39	4.0				34.67
M42	4.5	CINR3732S-22	-	TNN43IR450M	37.19
M45	4.5				40.19
M48	5.0	CINR3732S-22	-	TNN43IR500M	42.59
M52	5.0				46.59
M56	5.5	※ Threading of M56 and over is not available due to too large Pitch Size.			50.05
.					.
.					.
.					.

Metric Fine Thread: M

Part 1

Nominal Thread	Pitch (mm)	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
M 1×0.2	0.2	No Tools Available	-	-	0.78
.					.
.					.
.					.
M 5.5×0.5	0.5				4.96
M 6×0.75	0.75	-	PSTR0604-60S / VNTR045-11		5.19
M 7×0.75	0.75	-	PSTR0805-70S / VNTR060-11		6.20
M 8×1.0	1.0	-	PSTR0805-70S / VNTR060-11		6.92
		SINR0612S-06E	TNN06IR60005	-	
M 8×0.75	0.75	-	PSTR0805-70S / VNTR060-11		7.19
		SINR0612S-06E	TNN06IR60005	-	
M 9×1.0	1.0	-	PSTR0805-70S / VNTR060-11		7.92
		SINR0612S-06E	TNN06IR60005	-	
		SINR0816S-08E	TNN08IR60007		
M 9×0.75	0.75	-	PSTR0604-60S / VNTR045-11		8.19
		SINR0612S-06E	TNN06IR60005	-	
M10×1.25	1.25	-	PSTR0805-70S / VNTR060-11		8.65
		SINR0816S-08E	TNN08IR60007	-	
M10×1.0	1.0	-	PSTR0805-70S / VNTR060-11		8.92
		SINR0816S-08E	TNN08IR60007	-	
M10×0.75	0.75	-	PSTR0805-70S / VNTR060-11		9.19
		SINR0612S-06E	TNN06IR600005	-	
M11×1.0	1.0	-	PSTR0805-70S / VNTR060-11		9.92
		SINR0816S-08E	TNN08IR60007	-	
M11×0.75	0.75	-	PSTR0805-70S / VNTR060-11		10.19
		SINR0612S-06E	TNN06IR60005	-	
M12×1.5	1.5	SINR0816S-08E	TNN08IR60007	-	10.38
M12×1.25	1.25				10.65
M12×1.0	1.0				10.92
M14×1.5	1.5	SINR1216S-11E	TNN22IR60005	TNN22IR150M	12.38
M14×1.25	1.25			TNN22IR125M	12.65
M14×1.0	1.0			TNN22IR100M	12.92
M15×1.5	1.5	SINR1216S-11E	TNN22IR60005	TNN22IR150M	13.38
M15×1.0	1.0			TNN22IR100M	13.92
M16×1.5	1.5	SINR1216S-11E	TNN22IR60005	TNN22IR150M	14.38
M16×1.0	1.0			TNN22IR100M	14.92

Metric Fine Thread: M

Part 2

Nominal Thread	Pitch (mm)	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
M17×1.5	1.5	SINR1516S-11	TNN22IR60005	TNN22IR150M	15.38
M17×1.0	1.0			TNN22IR100M	15.92
M18×2.0	2.0	SINR1516S-11	-	TNN22IR200M	15.84
M18×1.5	1.5		TNN22IR60005	TNN22IR150M	16.38
M18×1.0	1.0			TNN22IR100M	16.92
M20×2.0	2.0	SINR1516S-11	-	TNN22IR200M	17.84
M20×1.5	1.5		TNN22IR60005	TNN22IR150M	18.38
M20×1.0	1.0			TNN22IR100M	18.92
M22×2.0	2.0	SINR1516S-11	-	TNN22IR200M	19.84
M22×1.5	1.5	SINR2016S-16	TNN32IR60015(-TS) TNN32IR6001(-TS)	TNN32IR150M(-TS)	20.38
M22×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	20.92
M24×2.0	2.0	SINR2016S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	21.84
M24×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	22.38
M24×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	22.92
M25×2.0	2.0	SINR2016S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	22.84
M25×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	23.38
M25×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	23.92
M26×1.5	1.5	SINR2420S-16	TNN32IR60015(-TS) TNN32IR6001(-TS)	TNN32IR150M(-TS)	24.38
M27×2.0	2.0	SINR2420S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	24.84
M27×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	25.38
M27×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	25.92
M28×2.0	2.0	SINR2420S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	25.84
M28×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	26.38
M28×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	26.92
M30×3.0	3.0	SINR2420S-22	-	TNN43IR300M	26.75
M30×2.0	2.0	SINR2420S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	27.84
M30×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	28.38
M30×1.0	1.0		TNN32IR6001(-TS)	TNN32IR100M(-TS)	28.92
M32×2.0	2.0	SINR2420S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	29.84
M32×1.5	1.5	CINR3025S-16	TNN32IR6001(-TS)	TNN32IR150M(-TS)	30.38
M33×3.0	3.0	SINR2420S-22	-	TNN43IR300M	29.75
M33×2.0	2.0	CINR3025S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	30.84
M33×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	31.38
M35×1.5	1.5	CINR3025S-16	TNN32IR6001(-TS)	TNN32IR150M(-TS)	33.38
M36×3.0	3.0	CINR3025S-22	-	TNN43IR300M	32.75
M36×2.0	2.0	CINR3025S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	33.84
M36×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	34.38
M38×1.5	1.5	CINR3025S-16	TNN32IR6001(-TS)	TNN32IR150M(-TS)	36.38
M39×3.0	3.0	CINR3025S-22	-	TNN43IR300M	35.75
M39×2.0	2.0	CINR3025S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	36.84
M39×1.5	1.5	CINR3732S-16	TNN32IR6001(-TS)	TNN32IR150M(-TS)	37.38
M40×3.0	3.0	CINR3025S-22	-	TNN43IR300M	36.75
M40×2.0	2.0	CINR3732S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	37.84
M40×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	38.38
M42×4.0	4.0	CINR3732S-22	-	TNN43IR400M	37.67
M42×3.0	3.0			TNN43IR300M	38.75
M42×2.0	2.0	CINR3732S-16	TNN32IR60015(-TS)	TNN32IR200M(-TS)	39.84
M42×1.5	1.5		TNN32IR6001(-TS)	TNN32IR150M(-TS)	40.38
M45×4.0	4.0	※ Threading of M45 and over can be machined by the same Tool for M42. (P=4.0, 3.0, 2.0, 1.5)			40.67
.					.
.					.
.					.

■ Unified Coarse Thread: UNC

Nominal Thread	TPI	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
2-56 UNC	56	No Tools Available	-	-	1.69
.					.
.					.
.					.
10-24 UNC	24				3.68
1/4-20 UNC	20	-	PSTR0604-60S / VNTR045-11		4.98
5/16-18 UNC	18	-	PSTR0805-70S / VNTR060-11		6.41
3/8-16 UNC	16	No Tools Available			7.81
7/16-14 UNC	14				9.15
1/2-13 UNC	13				10.58
9/16-12 UNC	12				12.00
5/8-11 UNC	11				13.38
3/4-10 UNC	10				16.30
7/8- 9 UNC	9	No Tools Available			19.17
.					
.					
.					

■ Unified Fine Thread: UNF

Nominal Thread	TPI	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
0-80 UNF	80	No Tools Available	-	-	1.18
.					.
.					.
.					.
10-32 UNF	32				3.97
1/4-28 UNF	28	-	PSTR0604-60S / VNTR045-11		5.37
5/16-24 UNF	24	-	PSTR0805-70S / VNTR060-11		6.79
		SINR0612S-06E	TNN06IR60005	-	
3/8-24 UNF	24	-	PSTR0805-70S / VNTR060-11		8.38
		SINR0612S-06E	TNN06IR60005	-	
7/16-20 UNF	20	SINR0816S-08E	TNN08IR60007	-	9.74
1/2-20 UNF	20				11.33
9/16-18 UNF	18	SINR1216S-11E	TNN22IR60005	-	12.76
5/8-18 UNF	18				14.35
3/4-16 UNF	16	SINR1516S-11	TNN22IR60005	-	17.33
7/8-14 UNF	14	SINR2016S-16	TNN32IR6001(-TS)	TNN32IR14UN	20.26
1 -12 UNF	12	SINR2016S-16	TNN32IR6001(-TS)	TNN32IR12UN	23.10
1 1/8-12 UNF	12	SINR2420S-16			26.28
1 1/4-12 UNF	12				29.46
1 3/8-12 UNF	12	CINR3025S-16			32.63
1 1/2-12 UNF	12				36.81

■ Whitworth Coarse Thread: W

Nominal Thread	TPI	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
W 1/4	20	No Tools Available	-	-	4.91
W 5/16	18				6.34
W 3/8	16	No Tools Available			7.73
W 7/16	14				9.06
W 1/2	12				10.30
W 9/16	12				11.89
W 5/8	11				13.26
W 3/4	10				16.17
W 7/8	9				19.03
W 1	8				21.80
W 1 1/8	7				24.47
W 1 1/4	7				27.64
W 1 3/8	6				30.13
W 1 1/2	6				33.30
W 1 5/8	5				35.52
W 1 3/4	5				38.69
.		No Tools Available			
.					
.					

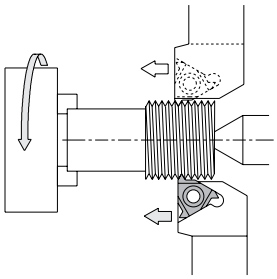
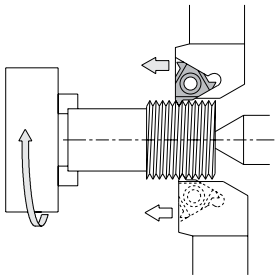
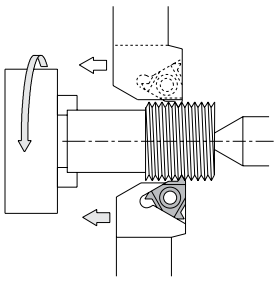
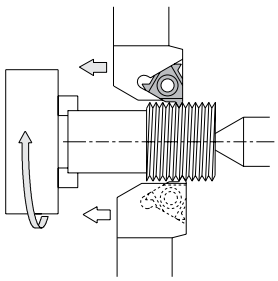
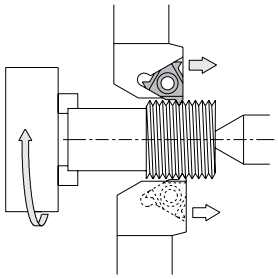
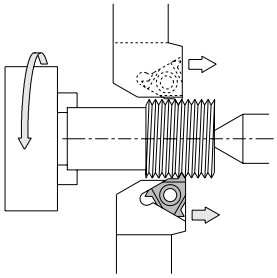
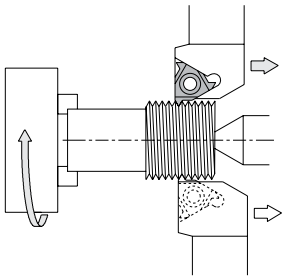
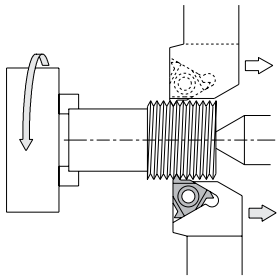
■ Whitworth Fine Thread: W

Nominal Thread	TPI	Female Thread			
		Toolholder	Insert		Bore Dia.
			Without Wiper Edge	With Wiper Edge	
W9.5 TPI24	24	SINR0816S-08E	TNN08IR5501	-	8.30
W10 TPI24	24				8.80
W10.5 TPI24	24				9.30
W9.5 TPI20	20	SINR0816S-08E	TNN08IR5501	-	8.06
W10 TPI20	20				8.56
W10.5 TPI20	20				9.06
W11 TPI20	20				9.56
W11.5 TPI20	20				10.06
W12 TPI20	20				10.56
W12.5 TPI20	20				11.06
W13 TPI20	20				11.56
W13.5 TPI20	20	SINR1216S-11E	TNN22IR55005		12.06
W11 TPI18	18	No Tools Available			9.40
W11.5 TPI18	18				9.90
W12 TPI18	18				10.40
W12.5 TPI18	18			-	10.90
W14 TPI18	18	SINR1216S-11E	TNN22IR55005	-	12.40
W14.5 TPI18	18				12.90
W15 TPI18	18				13.40
W16 TPI18	18				14.40
W13 TPI16	16	No Tools Available			11.20
W13.5 TPI16	16				11.70
W14 TPI16	16	SINR1216S-11E	TNN22IR55005	-	12.20
W14.5 TPI16	16				12.70
W15 TPI16	16				13.20
W17 TPI16	16				15.20
W18 TPI16	16				16.20
W19 TPI16	16				17.20
W20 TPI16	16				18.20
W16 TPI14	14	SINR1216S-11E	TNN22IR55005	-	13.94
W17 TPI14	14				14.94
W18 TPI14	14	SINR1516S-11	TNN22IR55005		15.94
W21 TPI14	14				18.94
W22 TPI14	14				19.94
W23 TPI14	14	SINR2016S-16	TNN32IR5501	(TNN32IR14W-TS)	20.94
W24 TPI14	14		TNN32IR5502	(TNN32IR14W)	21.94
W25 TPI14	14				22.94
W26 TPI14	14				23.94
W19 TPI12	12	No Tools Available			16.60
W20 TPI12	12				17.60
W21 TPI12	12				18.60
W22 TPI12	12				19.60
W28 TPI12	12	SINR2016S-16	TNN32IR5501	-	25.60
W30 TPI12	12		TNN32IR5502		27.60
W32 TPI12	12				29.60
W34 TPI12	12	CINR3025S-16	TNN32IR5501	-	31.60
W35 TPI12	12		TNN32IR5502		32.60
W36 TPI12	12				33.60
W38 TPI12	12				35.60
W40 TPI12	12	CINR3732S-16	TNN32IR5501	-	37.60
W42 TPI12	12		TNN32IR5502		39.60
W44 TPI12	12				41.60
W45 TPI12	12				42.60
W46 TPI12	12				43.60
W48 TPI12	12				45.60
W50 TPI12	12				47.60
.		※ Hereafter, 12 TPI Whitworth Fine Thread can be machined by the Same Tool as above.			.
.					.
.					.
W23 TPI10	10	No Tools Available			20.12
W24 TPI10	10				21.12
W25 TPI10	10				22.12
W26 TPI10	10				23.12
W28 TPI9	9				24.80
W30 TPI9	9				26.80
W32 TPI9	9				28.80
W34 TPI8	8				30.40
W35 TPI8	8				31.40
W36 TPI8	8				32.40
W38 TPI8	8				34.40
W40 TPI8	8				36.40
W42 TPI8	8				38.40
W44 TPI7	7				39.89
W45 TPI7	7				40.89
W46 TPI7	7				41.89
W48 TPI7	7				43.89
W50 TPI7	7				45.89
W52 TPI7	7				47.89
W55 TPI6	6				50.20
W58 TPI6	6				53.20
W60 TPI6	6				55.20
W62 TPI6	6				57.20
.		No Tools Available			.
.					.
.					.

How to Thread

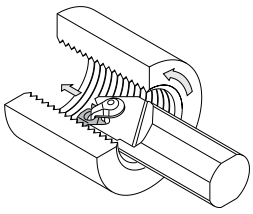
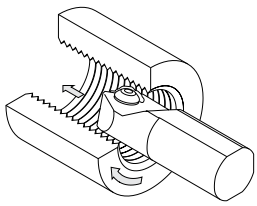
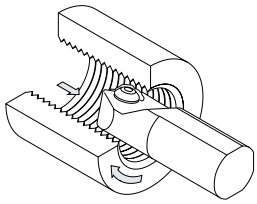
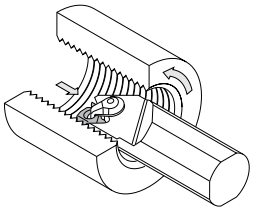
■ How to External Threading (R-hand Thread · L-hand Thread)

External Threading

R-hand Thread		L-hand Thread	
Toolholder	R-hand (R)	Toolholder	L-hand (L)
Insert	R-hand (R)	Insert	L-hand (L)
			
Toolholder	L-hand (L)	Toolholder	R-hand (R)
Insert	L-hand (L)	Insert	R-hand (R)
			
Toolholder	R-hand (R)	Toolholder	L-hand (L)
Insert	R-hand (R)	Insert	L-hand (L)
			
Toolholder	L-hand (L)	Toolholder	R-hand (R)
Insert	L-hand (L)	Insert	R-hand (R)
			

■ How to Internal Threading (R-hand Thread · L-hand Thread)

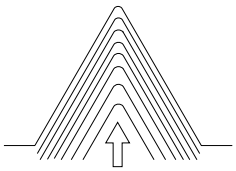
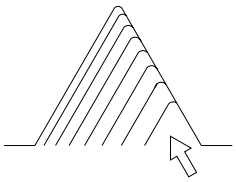
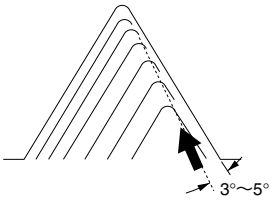
Internal Threading

R-hand Thread		L-hand Thread	
Toolholder	R-hand (R)	Toolholder	L-hand (L)
Insert	R-hand (R)	Insert	L-hand (L)
			
Toolholder	L-hand (L)	Toolholder	R-hand (R)
Insert	L-hand (L)	Insert	R-hand (R)
			

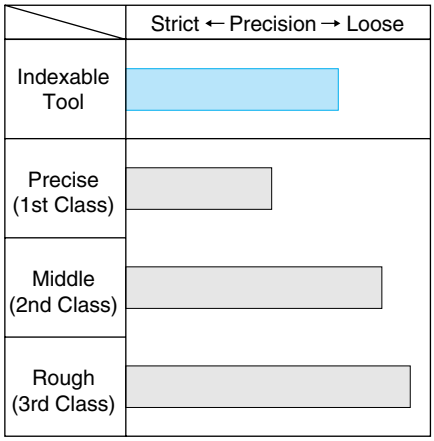
※These Tables are based on TNN type Tools.
KITG Type Tool: L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder

Infeed Methods / Accuracy of Thread

■ Infeed Methods

Infeed Methods	Feature
 Radial Infeed	· The Most Common Method. The Cutting Edge moves toward the Center of the Work Every Pass. · Suitable for relatively Small Pitch Size Threading. · V-shape Chips are generated and Chip Control may be difficult depending on Work Material.
 Flank Infeed	· Suitable for Large Pitch Size Threading. · Wear of Right Side Edge of the Figure (no a*p*) Tends to become Large. · Chips Flow to One Side.
 Flank Compound Infeed	· Revised Compound Methods of the above Flank Infeed Method. · No "No a*p*" Condition · Chips Flow to One Side. · This Method is recommended to Threading by 2-thread Insert.

■ Thread Precision Available to CERATIP

Fit Quality	Application Example	Availability to CERATIP	Thread Precision & Indexable Insert's Precision
Precise (1st Class)	Precise Screw of especially Less Play e.g.) Micrometer	×	
Middle (2nd Class)	General Purpose Screw for Machines, Implements, Structural Bodies, etc. e.g.) Bolts	○	
Rough (3rd Class)	Screw to be used at dirty and vulnerable Environment such as Construction and Installment, or the One which has difficulty in Threading, such as Threading to Hot Rolling Material, Tapping to Long Blind Hole, etc.	○	

Depth of Cut & Number of Pass

■ TNN type (With Wiper Edge)

(This Chart is based on the Case of TC60 and PR930. In case of TC40, set up a few more Passes respectively.)

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	C (mm)	Total ap (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	Male Thread	0.50mm	TNN32ER050M	0.33	0.38	4	0.14	0.12	0.08	0.04															
		0.75mm	075M	0.48	0.53	5	0.17	0.14	0.10	0.08	0.04														
		1.00mm	100M	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05														
		1.25mm	125M	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05													
		1.50mm	150M	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05													
		1.75mm	175M	1.11	1.19	8	0.26	0.22	0.19	0.16	0.13	0.10	0.08	0.05											
		2.00mm	200M	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05									
		2.50mm	250M	1.57	1.65	12	0.26	0.23	0.21	0.18	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05							
		3.00mm	TNN43ER300M	1.87	1.95	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.02					
		3.50mm	350M	2.18	2.26	15	0.28	0.25	0.22	0.20	0.20	0.18	0.16	0.15	0.15	0.12	0.10	0.10	0.08	0.05	0.02				
		4.00mm	400M	2.48	2.56	17	0.28	0.25	0.24	0.22	0.20	0.18	0.16	0.15	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02		
		4.50mm	450M	2.79	2.87	18	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.16	0.14	0.14	0.13	0.12	0.10	0.10	0.07	0.05	0.02	
		5.00mm	500M	3.10	3.18	19	0.30	0.28	0.27	0.26	0.23	0.20	0.18	0.18	0.17	0.16	0.16	0.15	0.15	0.13	0.12	0.10	0.07	0.05	0.02
	Female Thread	0.50mm	TNN22IR 050M	0.31	0.36	4	0.14	0.10	0.08	0.04															
		0.75mm	075M	0.45	0.50	5	0.15	0.14	0.10	0.07	0.04														
		1.00mm	100M	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.25mm	125M	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.50mm	150M	0.88	0.96	8	0.24	0.18	0.14	0.10	0.10	0.08	0.07	0.05											
		1.75mm	175M	1.02	1.10	9	0.24	0.18	0.16	0.14	0.10	0.10	0.08	0.05	0.05										
		2.00mm	200M	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
		1.25mm	TNN32IR 100M	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.50mm	125M	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.75mm	150M	0.88	0.96	8	0.22	0.18	0.14	0.12	0.10	0.08	0.07	0.05											
		2.00mm	175M	1.02	1.10	9	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05										
		2.50mm	200M	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
		3.00mm	250M	1.46	1.54	12	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.05							
		3.50mm	TNN43IR 300M	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.02					
		4.00mm	350M	2.05	2.13	15	0.26	0.24	0.22	0.20	0.17	0.17	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02				
		4.50mm	400M	2.34	2.42	17	0.26	0.24	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.05	0.05	0.02		
		5.00mm	450M	2.63	2.71	18	0.27	0.26	0.24	0.22	0.22	0.20	0.18	0.17	0.15	0.13	0.13	0.12	0.12	0.10	0.10	0.05	0.05	0.02	
			500M	2.92	3.00	19	0.28	0.26	0.24	0.22	0.20	0.20	0.18	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.05	0.02
Unified	Male Thread	24 TPI	TNN32ER24UN	0.67	0.75	5	0.24	0.20	0.16	0.10	0.05														
		20 TPI	20UN	0.80	0.88	6	0.24	0.20	0.16	0.13	0.10	0.05													
		18 TPI	18UN	0.89	0.97	6	0.26	0.22	0.18	0.15	0.11	0.05													
		16 TPI	16UN	1.01	1.09	7	0.26	0.22	0.18	0.15	0.12	0.11	0.05												
		14 TPI	14UN	1.15	1.23	8	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.05											
		12 TPI	12UN	1.34	1.42	11	0.26	0.22	0.18	0.16	0.13	0.12	0.10	0.08	0.07	0.05	0.05								
		8 TPI	TNN43ER08UN	1.98	2.06	15	0.30	0.26	0.22	0.20	0.16	0.15	0.14	0.13	0.10	0.10	0.10	0.07	0.06	0.05	0.02				
	Female Thread	24 TPI	TNN32IR 24UN	0.62	0.70	5	0.22	0.19	0.15	0.10	0.04														
		20 TPI	20UN	0.75	0.83	6	0.22	0.20	0.16	0.12	0.08	0.05													
		18 TPI	18UN	0.83	0.91	6	0.24	0.18	0.16	0.14	0.10	0.05													
		16 TPI	16UN	0.94	1.02	7	0.24	0.20	0.18	0.14	0.11	0.10	0.05												
		14 TPI	14UN	1.07	1.15	8	0.24	0.22	0.18	0.14	0.12	0.10	0.10	0.05											
		12 TPI	12UN	1.24	1.32	11	0.24	0.22	0.16	0.15	0.12	0.10	0.10	0.07	0.07	0.05	0.04								
		8 TPI	TNN43IR 08UN	1.84	1.92	15	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.10	0.10	0.09	0.05	0.05	0.02				
Parallel Pipe	Male Thread	19 TPI	TNN32ER19W	0.89	0.97	6	0.27	0.22	0.18	0.15	0.10	0.05													
		14 TPI	14W	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	11W	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Female Thread	14 TPI	TNN32IR 14W	1.19	1.27	9	0.36	0.19	0.17	0.13	0.12	0.10	0.08	0.07	0.05										
		11 TPI	11W	1.50	1.58	11	0.39	0.20	0.18	0.16	0.15	0.13	0.10	0.08	0.07	0.07	0.05								
Whitworth	Male Thread	14 TPI	TNN32ER14W	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	11W	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Female Thread	14 TPI	TNN32IR 14W	1.09	1.17	9	0.26	0.19	0.17	0.13	0.12	0.10	0.08	0.07	0.05										
		11 TPI	11W	1.40	1.48	11	0.29	0.20	0.18	0.16	0.15	0.13	0.10	0.08	0.07	0.07	0.05								
Tapered Pipe	Male Thread	28 TPI	TNN32ER28PT	0.58	0.63	5	0.20	0.15	0.13	0.11	0.04														
		19 TPI	19PT	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05													
		14 TPI	14PT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI	11PT	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
	Female Thread	28 TPI	TNN22IR 28PT	0.58	0.63	5	0.20	0.16	0.13	0.10	0.04														
		19 TPI	19PT	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04												
		14 TPI	14PT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		14 TPI	TNN32IR 14PT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI	11PT	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
American National Pipe	Male Thread	18 TPI	TNN32ER18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02						
		14 TPI	14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02				
		11.5 TPI	11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.04	0.02			
	Female Thread	18 TPI	TNN32IR 18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02						
		14 TPI	14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02				
		11.5 TPI	11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.04	0.02			

(This Chart is based on the Case of TC60 and PR930. In case of TC40, set up a few more Passes respectively.)

■ TNN type (With Wiper Edge)

· 1-Thread, With Chipbreaker (TS Chipbreaker)

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	C (mm)	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	Male Thread	1.00mm	TNN32E R/L 100M-TS	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05														
		1.25mm	125M-TS	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05													
		1.50mm	150M-TS	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05													
		2.00mm	200M-TS	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05									
	Female Thread	1.00mm	TNN32I R/L 100M-TS	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.50mm	150M-TS	0.88	0.96	8	0.24	0.18	0.14	0.10	0.10	0.08	0.07	0.05											
		2.00mm	200M-TS	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
Parallel Pipe	Male Thread	19 TPI	TNN32E R/L 19W-TS	0.89	0.97	6	0.28	0.20	0.18	0.16	0.10	0.05													
		14 TPI	14W-TS	1.19	1.27	9	0.29	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	11W-TS	1.50	1.58	12	0.29	0.20	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Female Thread	14 TPI	TNN32I R/L 14W-TS	1.09	1.17	9	0.26	0.19	0.17	0.13	0.12	0.10	0.08	0.07	0.05										
		11 TPI	11W-TS	1.40	1.48	11	0.29	0.20	0.18	0.16	0.15	0.13	0.10	0.08	0.07	0.07	0.05								
Whitworth	Male Thread	14 TPI	TNN32E R/L 14W-TS	1.19	1.27	9	0.29	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	11W-TS	1.50	1.58	12	0.29	0.20	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Female Thread	14 TPI	TNN32I R/L 14W-TS	1.09	1.17	9	0.26	0.19	0.17	0.13	0.12	0.10	0.08	0.07	0.05										
		11 TPI	11W-TS	1.40	1.48	11	0.29	0.20	0.18	0.16	0.15	0.13	0.10	0.08	0.07	0.07	0.05								
Tapered Pipe	Male Thread	19 TPI	TNN32E R/L 19PT-TS	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05													
		14 TPI	14PT-TS	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI	11PT-TS	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
	Female Thread	19 TPI	TNN22I R/L 19PT-TS	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04												
		14 TPI	14PT-TS	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		14 TPI	TNN32I R/L 14PT-TS	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI	11PT-TS	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							

· 2-Thread, With Chipbreaker

(*ap* shows Value of Radial *ap*)

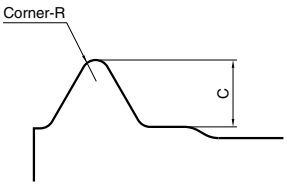
		Pitch mm	Description	C (mm)	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	Male Thread	1.00mm	TNN32ER 100M02	0.64	0.69	3	0.25	0.23	0.21																
		1.50mm	150M02	0.95	1.00	3	0.36	0.34	0.30																
		2.00mm	200M02	1.27	1.32	4	0.38	0.36	0.30	0.28															

■ TT type (60° With Wiper Edge)

(*ap* shows Value of Radial *ap*)

		Pitch mm	Description	C (mm)	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	Male Thread	1.00mm	TT43ER 100M	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05														
		1.25mm	125M	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05													
		1.50mm	150M	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05													
		2.00mm	200M	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05									

Caution
1) Max. *ap* is based on the Value of C+0.05mm～C+0.08mm.
2) Final *ap* for Finishing shall be 0.02～0.05mm.
3) Prepare Chamfering for C0.3～C0.5 to the Work to prevent the Insert Crack at the 1st Pass.
4) Wet Cutting is recommended.



■ TNN type (Without Wiper Edge)

(*ap* shows Value of Radial *ap*)

		Pitch mm	Description	C (mm)	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
30° Trapezoidal	Male Thread	2.00mm	TNN32ER 200TR	-	1.25	10	0.22	0.20	0.17	0.16	0.13	0.12	0.10	0.07	0.05	0.03									
		3.00mm	300TR	-	1.75	14	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.10	0.10	0.07	0.05	0.03					
		4.00mm	TNN43ER 400TR	-	2.24	15	0.26	0.24	0.22	0.20	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03				
		5.00mm	500TR	-	2.73	17	0.28	0.26	0.24	0.22	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03		
	Female Thread	2.00mm	TNN32IR 200TR	-	1.25	10	0.22	0.20	0.17	0.16	0.13	0.12	0.10	0.07	0.05	0.03									
		3.00mm	300TR	-	1.75	14	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.10	0.10	0.07	0.05	0.03					
		4.00mm	TNN43IR 400TR	-	2.24	15	0.26	0.24	0.22	0.20	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03				
		5.00mm	500TR	-	2.73	17	0.28	0.26	0.24	0.22	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03		

Depth of Cut & Number of Pass

(This Chart is based on the Case of TC60 and PR930. In case of TC40, set up a few more Passes respectively.)

■ TNN06/08 type (60° · 55° Without Wiper Edge, For Internal Small Dia.)

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	Corner-R	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric (60°)	Female Thread	0.75mm	TNN06I R/L 60005	0.05	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03									
		1.00mm	TNN06I R/L 60005	0.05	0.60	12	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.03							
			TNN08I R/L 60007	0.07	0.58	12	0.07	0.06	0.06	0.06	0.06	0.05	0.04	0.04	0.04	0.04	0.03	0.03							
		1.25mm	TNN06I R/L 60005	0.05	0.76	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03					
			TNN08I R/L 60007	0.07	0.74	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03					
		1.50mm	TNN08I R/L 60007	0.07	0.90	17	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03		
		1.75mm	TNN08I R/L 60007	0.07	1.07	19	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03
Parallel Pipe (55°)	Female Thread	28 TPI	TNN06I R/L 5501	0.10	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03							
			TNN08I R/L 5501																						
		19 TPI	TNN08I R/L 5501	0.10	0.95	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	
Whitworth (55°)	Female Thread	24 TPI	TNN06I R/L 5501	0.10	0.65	13	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03						
			TNN08I R/L 5501																						
		20 TPI	TNN08I R/L 5501	0.10	0.81	15	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03				

Caution 1)The Standard V_c is 30 - 50m/min. Under the Small Dia. and High Revolution Situation, the Table Feed may not follow the Expected Conditions depending on the Machine.
2)Wet cutting is recommended.

■ TNN22/32 type (60° · 55° Without Wiper Edge)

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	Corner-R	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric (60°)	Male Thread	1.00mm	TNN32E R/L 6001	0.10	0.66	5	0.20	0.18	0.12	0.09	0.05														
		1.25mm	TNN32E R/L 6001	0.10	0.85	6	0.23	0.20	0.14	0.12	0.07	0.05													
		1.50mm	TNN32E R/L 6001	0.10	1.04	8	0.23	0.21	0.19	0.15	0.11	0.06	0.05	0.04											
			6002	0.20	0.94	7	0.23	0.20	0.18	0.14	0.10	0.05	0.04												
		1.75mm	TNN32E R/L 6001	0.10	1.23	9	0.25	0.22	0.20	0.17	0.14	0.09	0.07	0.05	0.04										
			6002	0.20	1.13	8	0.25	0.22	0.20	0.16	0.14	0.07	0.05	0.04											
		2.00mm	TNN32E R/L 6001	0.10	1.42	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
			6002	0.20	1.32	10	0.25	0.22	0.20	0.16	0.14	0.12	0.08	0.07	0.04	0.04									
		2.50mm	TNN32E R/L 6001	0.10	1.79	13	0.25	0.22	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.09	0.08	0.05	0.04						
			6002	0.20	1.69	12	0.25	0.22	0.20	0.18	0.16	0.16	0.12	0.12	0.10	0.08	0.06	0.04							
	Female Thread	0.75mm	TNN22I R/L 60005	0.05	0.44	5	0.14	0.12	0.10	0.06	0.02														
		1.00mm	TNN22I R/L 60005	0.05	0.60	6	0.18	0.15	0.10	0.08	0.05	0.04													
		1.25mm	TNN22I R/L 60005	0.05	0.76	7	0.18	0.15	0.12	0.10	0.10	0.07	0.04												
		1.50mm	TNN22I R/L 60005	0.05	0.92	9	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.06	0.04										
			TNN32I R/L 6001	0.10	0.87	8	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05											
		1.75mm	TNN32I R/L 6001	0.10	1.04	9	0.20	0.18	0.15	0.12	0.12	0.10	0.08	0.05	0.04										
		2.00mm	TNN32I R/L 6001	0.10	1.20	11	0.20	0.18	0.15	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.04								
		2.50mm	TNN32I R/L 6001	0.10	1.52	14	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.06	0.04	0.02					
			600015	0.15	1.47	13	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.04	0.02						
Parallel Pipe (55°)	Male Thread	28 TPI	TNN32E R/L 5501	0.10	0.61	5	0.20	0.16	0.12	0.08	0.05														
		19 TPI	TNN32E R/L 5501	0.10	0.95	7	0.22	0.20	0.16	0.14	0.10	0.08	0.05												
		14 TPI	TNN32E R/L 5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	TNN32E R/L 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02						
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02							
	Female Thread	28 TPI	TNN22I R/L 55005	0.05	0.67	7	0.18	0.15	0.12	0.08	0.06	0.05	0.03												
			TNN32I R/L 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.05	0.03													
		19 TPI	TNN22I R/L 55005	0.05	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
			TNN32I R/L 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05												
		14 TPI	TNN22I R/L 55005	0.05	1.39	11	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05								
			TNN32I R/L 5501	0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.14	0.11	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.20	0.18	0.18	0.16	0.15	0.12	0.10	0.08	0.05										
		11 TPI	TNN32I R/L 5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.07	0.05							
			5502	0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.12	0.08	0.05								
Whitworth (55°)	Male Thread	24 TPI	TNN32E R/L 5501	0.10	0.73	6	0.22	0.18	0.12	0.09	0.07	0.05													
		20 TPI	TNN32E R/L 5501	0.10	0.90	6	0.22	0.18	0.17	0.16	0.12	0.05													
		18 TPI	TNN32E R/L 5501	0.10	1.01	7	0.24	0.20	0.18	0.16	0.10	0.08	0.05												
		16 TPI	TNN32E R/L 5501	0.10	1.15	9	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05										
			5502	0.20	1.04	8	0.24	0.20	0.16	0.14	0.10	0.08	0.07	0.05											
		14 TPI	TNN32E R/L 5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		12 TPI	TNN32E R/L 5501	0.10	1.58	12	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.08	0.07	0.05							
			5502	0.20	1.46	11	0.25	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.08	0.07	0.05								
		11 TPI	TNN32E R/L 5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.07	0.05							
			5502	0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.08	0.05								
		10 TPI	TNN32E R/L 5501	0.10	1.92	14	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.12	0.10	0.10	0.08	0.08	0.05	0.02					
			5502	0.20	1.80	13	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05	0.02						
		9 TPI	TNN32E R/L 5502	0.20	2.03	14	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.08	0.06	0.02					
	Female Thread	24 TPI	TNN22I R/L 55005	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.05	0.03												
			TNN32I R/L 5501	0.10	0.65	6	0.18	0.15	0.12	0.10	0.07	0.03													
		20 TPI	TNN22I R/L 55005	0.05	0.87	8	0.18	0.16	0.14	0.12	0.10	0.06	0.06	0.05											
			TNN32I R/L 5501	0.10	0.81	7	0.18	0.16	0.14	0.12	0.10	0.06	0.05												
		18 TPI	TNN22I R/L 55005	0.05	0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05											
			TNN32I R/L 5501	0.10	0.91	7	0.20	0.18	0.16	0.14	0.10	0.08	0.05												
		16 TPI	TNN22I R/L 55005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.10	0.10	0.08	0.08	0.05										
			TNN32I R/L 5501	0.10	1.04	8	0.20	0.18	0.16	0.15	0.12	0.10	0.08	0.05											
			5502	0.20	0.92	7	0.20	0.18	0.16	0.15	0.10	0.08	0.05												
		14 TPI	TNN22I R/L 55005	0.05	1.26	10	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.08	0.05									
			TNN32I R/L 5501	0.10	1.20	9	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.08	0.05										
			5502	0.20	1.08	8	0.20	0.18	0.18	0.16	0.13	0.10	0.08	0.05											
		12 TPI	TNN32I R/L 5501	0.10	1.42	10	0.25	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05									
			5502	0.20	1.30	9	0.25	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05										
		11 TPI	TNN32I R/L 5501	0.10	1.56	11	0.25	0.20	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.08	0.05								
			5502	0.20	1.44	10	0.25	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.08	0.05									

Caution
1) Select the Insert with Suitable Corner-R Designated by Pitch Respectively.
2) Do not exceed 0.3mm for the 1st *ap*
3) Final *ap* for Finishing shall be 0.02~0.05mm.
4) Prepare Chamfering for C0.3~C0.5 to the Work to prevent the Insert Crack at the 1st Pass.
5) Wet Cutting is recommended.

■ TT type (60° · 55° Without Wiper Edge) Part 1

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	Corner-R	Total ap (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	Male Thread	0.50mm	TT32℄ 6000	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02											
		0.70mm	TT32℄ 6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02										
		0.75mm	TT32℄ 6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02									
		0.80mm	TT32℄ 6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02									
		1.00mm	TT32℄ 6000	0.00	0.76	8	0.15	0.13	0.12	0.12	0.10	0.08	0.06	0.02									
			TT32/43℄ 6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02											
		1.25mm	TT32℄ 6000	0.00	0.95	9	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
			TT32/43℄ 6001	0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02										
		1.50mm	TT32℄ 6000	0.00	1.14	10	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.07	0.05	0.02							
			TT32/43℄ 6001	0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
			6002	0.20	0.94	8	0.25	0.18	0.14	0.12	0.10	0.08	0.05	0.02									
		1.75mm	TT32℄ 6000	0.00	1.33	11	0.25	0.23	0.20	0.13	0.10	0.10	0.10	0.08	0.07	0.05	0.02						
			TT32/43℄ 6001	0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02							
			6002	0.20	1.13	9	0.25	0.23	0.20	0.13	0.10	0.08	0.07	0.05	0.02								
		2.00mm	TT32℄ 6000	0.00	1.52	12	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.10	0.08	0.05	0.02					
			TT32/43℄ 6001	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02						
			6002	0.20	1.32	10	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.08	0.05	0.02							
		2.50mm	TT32℄ 6000	0.00	1.89	13	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.14	0.13	0.10	0.08	00.6	0.02				
			TT32/43℄ 6001	0.10	1.79	12	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.06	0.02						
			6002	0.20	1.69	11	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.10	0.08	0.02						
			6003	0.30	1.59	11	0.27	0.25	0.20	0.18	0.17	0.15	0.12	0.10	0.08	0.05	0.02						
		3.00mm	TT43℄ 6001	0.10	2.17	14	0.30	0.25	0.23	0.20	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02			
			6002	0.20	2.07	13	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.13	0.12	0.10	0.05	0.02				
			6003	0.30	1.97	12	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.02					
			6004	0.40	1.87	12	0.30	0.25	0.23	0.20	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.02					
		3.50mm	TT43℄ 6001	0.10	2.55	16	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02	
			6002	0.20	2.45	15	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.10	0.10	0.05	0.02		
			6003	0.30	2.35	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.02			
			6004	0.40	2.25	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02			
	Female Thread	0.50mm	TT32℄ 6000	0.00	0.32	5	0.12	0.08	0.06	0.04	0.02												
		0.70mm	TT32℄ 6000	0.00	0.45	6	0.15	0.10	0.08	0.06	0.04	0.02											
		0.75mm	TT32℄ 6000	0.00	0.49	6	0.15	0.12	0.08	0.07	0.05	0.02											
		0.80mm	TT32℄ 6000	0.00	0.52	6	0.15	0.12	0.10	0.08	0.05	0.02											
		1.00mm	TT32℄ 6000	0.00	0.65	7	0.15	0.14	0.12	0.10	0.08	0.04	0.02										
		1.25mm	TT32℄ 6000	0.00	0.81	8	0.18	0.16	0.14	0.12	0.10	0.05	0.04	0.02									
		1.50mm	TT32℄ 6000	0.00	0.97	9	0.20	0.18	0.16	0.14	0.10	0.08	0.05	0.04	0.02								
			TT32/43℄ 6001	0.10	0.87	8	0.20	0.18	0.16	0.14	0.08	0.05	0.04	0.02									
		1.75mm	TT32℄ 6000	0.00	1.14	10	0.20	0.18	0.16	0.13	0.12	0.10	0.10	0.08	0.05	0.02							
			TT32/43℄ 6001	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02								
		2.00mm	TT32℄ 6000	0.00	1.30	12	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.10	0.08	0.05	0.03	0.02					
			TT32/43℄ 6001	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02						
		2.50mm	TT32℄ 6000	0.00	1.62	14	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.03	0.02			
			TT32/43℄ 6001	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02				
		3.00mm	TT43℄ 6001	0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02		
			6002	0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02			
Parallel Pipe (55°)	Male Thread	28 TPI	TT32℄ 5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02												
		19 TPI	TT32/43℄ 5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02									
		14 TPI	TT32/43℄ 5501	0.10	1.34	10	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	1.22	9	0.25	0.22	0.20	0.18	0.12	0.10	0.08	0.05	0.02								
		11 TPI	TT32/43℄ 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
	Female Thread	28 TPI	TT32/43℄ 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.06	0.02											
		19 TPI	TT32/43℄ 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05										
		14 TPI	TT32/43℄ 5501	0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.14	0.11	0.10	0.08	0.05							
			5502	0.20	1.22	9	0.20	0.18	0.18	0.16	0.15	0.12	0.10	0.08	0.05								
		11 TPI	TT32/43℄ 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
Whitworth (55°)	Male Thread	24 TPI	TT32/43℄ 5501	0.10	0.73	6	0.20	0.18	0.16	0.12	0.05	0.02											
		20 TPI	TT32/43℄ 5501	0.10	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
		18 TPI	TT32/43℄ 5501	0.10	1.01	8	0.20	0.18	0.18	0.16	0.12	0.10	0.05	0.02									
		16 TPI	TT32/43℄ 5501	0.10	1.15	9	0.25	0.20	0.18	0.14	0.12	0.10	0.08	0.06	0.02								
			5502	0.20	1.04	8	0.25	0.20	0.18	0.14	0.10	0.08	0.07	0.02									
		14 TPI	TT32/43℄ 5501	0.10	1.34	10	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	1.22	9	0.25	0.22	0.20	0.18	0.12	0.10	0.08	0.05	0.02								
		12 TPI	TT32/43℄ 5501	0.10	1.58	12	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.10	0.08	0.06	0.02					
			5502	0.20	1.46	11	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.06	0.02						
		11 TPI	TT32/43℄ 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			5503	0.10	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
		10 TPI	TT32/43℄ 5501	0.10	1.92	14	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.12	0.10	0.10	0.08	0.08	0.05	0.02			
			5502	0.20	1.80	13	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05	0.02				
			TT43℄ 5503	0.30	1.68	12	0.25	0.23	0.20	0.18	0.18	0.14	0.13	0.12	0.10	0.08	0.05	0.02					
		9 TPI	TT43℄ 5501	0.10	2.14	14	0.25	0.23	0.23	0.20	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02			
			5502	0.20	2.03	13	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.02				
			5503	0.30	1.91	12	0.30	0.25	0.23	0.23	0.20	0.18	0.15	0.12	0.10	0.08	0.05	0.02					
		8 TPI	TT43℄ 5501	0.10	2.43	15	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.05	0.02		
			5502	0.20	2.31	14	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.05	0.02			
			5503	0.30	2.19	13	0.30	0.27	0.25	0.23	0.20	0.18	0.18	0.15	0.14	0.12	0.10	0.05	0.02				
			5504	0.40	2.08	12	0.30	0.27	0.25	0.23	0.23	0.20	0.18	0.15	0.12	0.08	0.05	0.02					
		7 TPI	TT43℄ 5501	0.10	2.79	17	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.18	0.16	0.16	0.16	0.14	0.14	0.12	0.10	0.05	0.02
			5502	0.20	2.67	16	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.05	0.02	
			5503	0.30	2.56	15	0.30	0.27	0.25	0.23	0.20	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.05	0.02		
			5504	0.40	2.44	14	0.30	0.28	0.27	0.25	0.23	0.22	0.20	0.16	0.15	0.13	0.10	0.08	0.05	0.02			

Depth of Cut & Number of Pass

■ TT type (60° · 55° Without Wiper Edge) Part 2

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	Corner-R	Total ap (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Whitworth (55°)	Female Thread	24 TPI	TT32/43R 5501	0.10	0.65	6	0.20	0.16	0.12	0.10	0.05	0.02											
		20 TPI	TT32/43R 5501	0.10	0.81	7	0.20	0.18	0.16	0.12	0.08	0.05	0.02										
		18 TPI	TT32/43R 5501	0.10	0.91	8	0.20	0.18	0.16	0.15	0.10	0.05	0.05	0.02									
		16 TPI	TT32/43R 5501	0.10	1.04	9	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.05	0.02								
			5502	0.20	0.92	8	0.20	0.18	0.16	0.13	0.10	0.08	0.05	0.02									
		14 TPI	TT32/43R 5501	0.10	1.20	10	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	1.08	9	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.05	0.02								
		12 TPI	TT32/43R 5501	0.10	1.42	10	0.23	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02							
			5502	0.20	1.30	9	0.25	0.22	0.20	0.18	0.16	0.12	0.10	0.05	0.02								
		11 TPI	TT32/43R 5501	0.10	1.56	11	0.25	0.22	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.05	0.02						
			5502	0.20	1.44	10	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02							
			5503	0.30	1.33	9	0.25	0.22	0.20	0.18	0.16	0.14	0.10	0.06	0.02								
		10 TPI	TT32/43R 5501	0.10	1.73	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.14	0.12	0.10	0.05	0.02					
			5502	0.20	1.61	11	0.25	0.22	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.05	0.02						
			TT43R 5503	0.30	1.50	10	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.05	0.02							
		9 TPI	TT43R 5501	0.10	1.93	13	0.25	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02				
			5502	0.20	1.82	12	0.25	0.23	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.05	0.02					
			5503	0.30	1.70	11	0.25	0.22	0.22	0.20	0.20	0.18	0.14	0.12	0.10	0.05	0.02						
		8 TPI	TT43R 5501	0.10	2.19	15	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.06	0.05	0.02		
			5502	0.20	2.07	14	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.02			
			5503	0.30	1.96	13	0.30	0.25	0.23	0.22	0.20	0.18	0.15	0.12	0.10	0.08	0.06	0.05	0.02				
			5504	0.40	1.84	12	0.30	0.25	0.23	0.21	0.20	0.18	0.14	0.12	0.08	0.06	0.05	0.02					

■ TTX type (60° · 55° Without Wiper Edge)

(*ap* shows Value of Radial *ap*)

		Pitch mm · TPI	Description	Corner-R	Total ap (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	Male Thread	0.50mm	TTX32R 6000 6000S	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02											
			60005 60005S	0.05	0.33	5	0.10	0.10	0.07	0.04	0.02												
		0.70mm	TTX32R 6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02										
			60005	0.05	0.48	6	0.10	0.10	0.10	0.10	0.06	0.02											
		0.75mm	TTX32R 6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02									
			60005	0.05	0.52	7	0.10	0.10	0.10	0.08	0.07	0.05	0.02										
		0.80mm	TTX32R 6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02									
			60005	0.05	0.56	7	0.10	0.10	0.10	0.10	0.08	0.06	0.02										
		1.00mm	TTX32R 6000	0.00	0.76	8	0.15	0.13	0.12	0.12	0.10	0.08	0.04	0.02									
			60005	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.06	0.02										
			6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02											
		1.25mm	TTX32R 6001	0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02										
		1.50mm	TTX32R 6001	0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
		1.75mm	TTX32R 6001	0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02							
		2.00mm	TTX32R 6001	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02	0.02					
Parallel Pipe (55°)	Male Thread	28 TPI	TTX32R 5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02												
		19 TPI	TTX32R 5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02									
			55015	0.15	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
		14 TPI	TTX32R 55015	0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02							
		11 TPI	TTX32R 55015	0.15	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.06						
Whitworth (55°)	Male Thread	24 TPI	TTX32R 5501	0.10	0.73	6	0.20	0.18	0.16	0.12	0.05	0.02											
		20 TPI	TTX32R 5501	0.10	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
			TTX32R 55015	0.15	0.84	7	0.20	0.18	0.16	0.12	0.10	0.06	0.02										
		18 TPI	TTX32R 55015	0.15	0.95	8	0.20	0.18	0.15	0.14	0.12	0.10	0.04	0.02									
		16 TPI	TTX32R 55015	0.15	1.10	9	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.06	0.02								
		14 TPI	TTX32R 55015	0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02							
		12 TPI	TTX32R 55015	0.15	1.52	11	0.25	0.20	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.05	0.02						
		11 TPI	TTX32R 55015	0.15	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.06	0.02					

Caution

1) Select the Insert with Suitable Corner-R Designated by Pitch Respectively.
2) Do not exceed 0.3mm for the 1st *ap*
3) Final *ap* for Finishing shall be 0.02～0.05mm.
4) Prepare Chamfering for C0.3～C0.5 to the Work to prevent the Insert Crack at the 1st Pass.
5) Wet Cutting is recommended.

• TTX type

Available to the Threading of smaller Pitch Size or more TPI than TT type.
Also available to the Threading to the Shoulder.

Insert \ Thread Type	Metric (mm)	Unified (TPI)	Parallel Pipe (TPI)	Whitworth (TPI)
TTX32R6000	0.5～1.0	56～32	-	-
60005	0.5～1.0	48～32	-	-
6001	1.0～2.0	28～14	-	-
TTX32R6000S	0.5	56～48	-	-
60005S	0.5	48	-	-
TTX32R5501	-	-	28～19	24～20
55015	-	-	19～11	20～14

◆ Corner-R Selection for Insert without Wiper Edge

	Male Thread	Female Thread
Metric Unified	R≦0.1443P	R≦0.0720P
Parallel Pipe (Whitworth) Tapered Pipe	(For Both Male and Female Thread) R≦0.1373P	

R: Corner-R P: Pitch ($=\frac{25.4}{n}$) n: TPI

● Metric, Unified Thread

Corner-R at Female Threading is almost half of that of Male.

● Parallel Pipe, Tapered Pipe, Whitworth Thread

Same Corner-R for Both Male and Female Threading

■ TPGB type (60° Without Wiper Edge)

(*ap* shows Value of Radial *ap*)

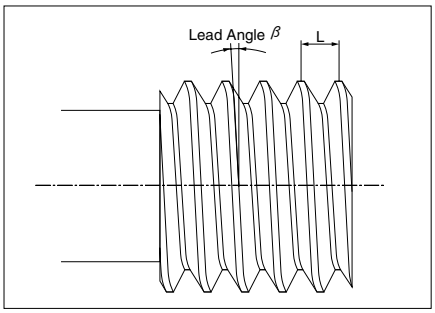
		Pitch mm · TPI	Description	Corner-R	Total *ap* (mm)	No. of Pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	Female Thread	0.75mm	TPGB 1102005 1103005	0.05	0.44	5	0.15	0.12	0.10	0.05	0.02												
		0.80mm	TPGB 1102005 1103005	0.05	0.47	5	0.15	0.14	0.10	0.06	0.02												
		1.00mm	TPGB 1102005 1103005	0.05	0.60	6	0.18	0.14	0.12	0.10	0.04	0.02											
		1.25mm	TPGB 1102005 1103005	0.05	0.76	7	0.18	0.16	0.14	0.12	0.10	0.04	0.02										
		1.50mm	TPGB 1102005 1103005	0.05	0.92	8	0.20	0.18	0.16	0.14	0.10	0.08	0.04	0.02									
			110201 110301	0.10	0.87	8	0.20	0.18	0.16	0.14	0.08	0.05	0.04	0.02									
		1.75mm	TPGB 1102005 1103005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.04	0.02								
			110301	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02								
		2.00mm	TPGB 1102005 1103005	0.05	1.25	11	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.06	0.04	0.02						
			110301	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02						
		2.50mm	TPGB 1102005 1103005	0.05	1.57	13	0.23	0.20	0.18	0.18	0.14	0.13	0.12	0.10	0.08	0.07	0.07	0.05	0.02				
			110301	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02				
		3.00mm	TPGB 1102005 1103005	0.05	1.90	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.12	0.10	0.08	0.08	0.07	0.05	0.02		
			110301	0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02		
			110302	0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02			
		3.50mm	TPGB 1102005 1103005	0.05	2.22	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02	
			110301	0.10	2.17	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.10	0.08	0.07	0.05	0.02	
			110302	0.20	2.07	15	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.07	0.05	0.02		

■ Lead Angle of Thread

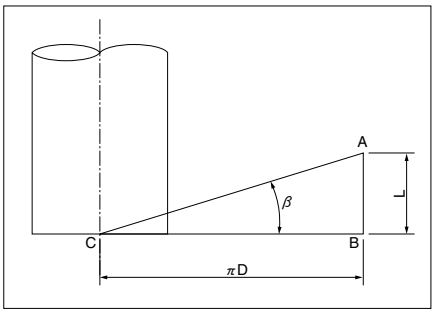
Thread's Lead Angle β as shown in Fig. 1 decides from the Work Diameter (Pitch Dia.) "D" and Lead "L"(in case of Single-start Thread , it is the same as Pitch "P"). Rolling a right-angled Triangle around a Cylinder and the Angle ACB in Fig. 2 becomes the Lead Angle β. The Calculation Formula is shown as follows.

$$\tan\beta = \frac{L}{\pi D} = \frac{nP}{\pi D}$$

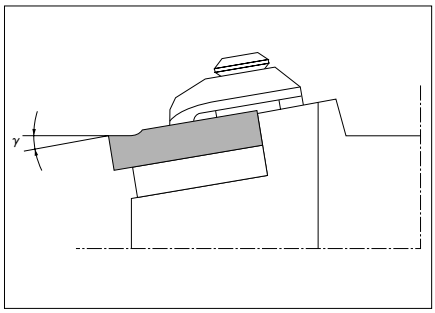
β: Lead Angle D: Pitch Dia. n: Number of Thread (such as double-start thread) P: Pitch
L: Lead (In case of single-start thread, it is equal to P. In case of n-start thread, it is equal to n×P)



(Fig.1)



(Fig.2)

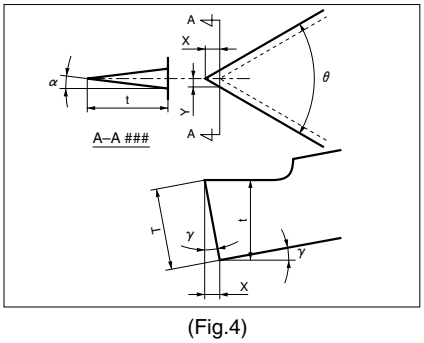


(Fig.3)

■ Relief Angle of Thread

Against this Lead Angle, the Threading Insert needs Side Relief Angle α. TNN type Threading Insert is a negative Insert and it does not prepare the Relief Angle originally. But when installing the Insert on the Toolholder, the Edge Inclination Angle γ is prepared as shown in Fig. 3, and it generates both the front Relief Angle and the Side Relief Angle α. This Side Relief Angle is obtained by the Formula as follows. (See Fig. 4)

$$\tan\alpha = \tan\gamma \times \tan\left(\frac{\theta}{2}\right)$$



(Fig.4)

Symbol	Example
α: Side Relief Angle	
γ: Inclination Angle after Installing Insert	External Insert : 10° Internal Insert : 15°
θ: Insert's Thread Angle	Metric : 60° Tapered Pipe : 55° 30° Trapezoidal : 30°
T: Insert Thickness	

$X = T\sin\gamma$
$Y = X\tan(\theta/2) = t\tan\alpha$
$t = T\cos\gamma$

(Chart 1)

Inserts	α: Side Relief Angle	
	External	Internal
60° Thread (M, UN, NPT)	5°49'	8°47'
55° Thread (W, PT)	5°14'	7°56'
30° Thread (TR)	2°43'	5°7'

This Side Relief Angle α becomes as shown in Chart 1 depending on the Insert.
However, the Side Relief Angle is prepared to Toolholder itself for 1°, and the actual Side Relief Angle becomes α+ 1°.

Recommended Cutting Conditions

■ KTN / KTNS

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Coated		Carbide
	TC40	**TC60**	**PR630**	**PR930**	**KW10**
Carbon Steel (SxxC etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.3mm	under 0.3mm	under 0.3mm	
Alloy Steel (SCM etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.3mm	under 0.3mm	under 0.3mm	
Stainless Steel (SUS304 etc.)	-	☆ 60~80	☆ 60~80	★ 60~80	-
First *ap*(Radial)		under 0.25mm	under 0.25mm	under 0.25mm	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.3mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.3mm
Brass	-	-	-	-	★ 150~300
First *ap*.(Radial)					under 0.3mm

■ KTT

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Coated		Carbide
	TC30	**TC60**	**PR630**	**PR930**	**KW10**
Carbon Steel (SxxC etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.2mm	under 0.3mm	under 0.3mm	under 0.3mm	
Alloy Steel (SCM etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.2mm	under 0.3mm	under 0.3mm	under 0.3mm	
Stainless Steel (SUS304 etc.)	-	☆ 60~80	☆ 60~80	★ 60~80	-
First *ap*(Radial)		under 0.25mm	under 0.25mm	under 0.25mm	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.3mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.3mm
Brass	-	-	-	-	★ 150~300
First *ap*(Radial)					under 0.3mm

■ KTTX

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Coated		Carbide
	TC40	**TC60**	**PR630**	**PR930**	**KW10**
Carbon Steel (SxxC etc.)	-	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)		under 0.3mm	under 0.3mm	under 0.3mm	
Alloy Steel (SCM etc.)	-	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)		under 0.3mm	under 0.3mm	under 0.3mm	
Stainless Steel (SUS304 etc.)	-	☆ 60~80	☆ 60~80	★ 60~80	-
First *ap*(Radial)		under 0.25mm	under 0.25mm	under 0.25mm	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.3mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.3mm
Brass	-	-	-	-	★ 150~300
First *ap*(Radial)					under 0.3mm

■ SIN / CIN

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Coated		Carbide
	TC40	**TC60**	**PR630**	**PR930**	**KW10**
Carbon Steel (SxxC etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.3mm	under 0.3mm	under 0.3mm	
Alloy Steel (SCM etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.3mm	under 0.3mm	under 0.3mm	
Stainless Steel (SUS304 etc.)	-	☆ 60~80	☆ 60~80	★ 60~80	-
First *ap*(Radial)		under 0.25mm	under 0.25mm	under 0.25mm	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.3mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.3mm
Brass	-	-	-	-	★ 150~300
First *ap*(Radial)					under 0.3mm

■ STWP

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Cermet		Carbide
	TN6020	**TN60**	**PV7020**	**PV60**	**KW10**
Carbon Steel (SxxC etc.)	☆ 100~150	☆ 100~150	★ 100~150	☆ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.25mm	under 0.25mm	under 0.25mm	
Alloy Steel (SCM etc.)	☆ 100~150	☆ 100~150	★ 100~150	☆ 100~150	-
First *ap*(Radial)	under 0.25mm	under 0.25mm	under 0.25mm	under 0.25mm	
Stainless Steel (SUS304 etc.)	-	-	-	-	-
First *ap*(Radial)					
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.25mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.25mm
Brass	-	-	-	-	★ 150~300
First *ap*(Radial)					under 0.25mm

■ KITG

Work Material	Recommended Insert Grade (V_C: m/min)				
	Cermet		PVD Coated		Carbide
	TC30	**TC60**	**PR630**	**PR930**	**KW10**
Carbon Steel (SxxC etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.2mm	under 0.3mm	under 0.3mm	under 0.3mm	
Alloy Steel (SCM etc.)	☆ 100~150	☆ 100~150	☆ 100~150	★ 100~150	-
First *ap*(Radial)	under 0.2mm	under 0.3mm	under 0.3mm	under 0.3mm	
Stainless Steel (SUS304 etc.)	-	☆ 60~80	☆ 60~80	★ 60~80	-
First *ap*(Radial)		under 0.25mm	under 0.25mm	under 0.25mm	
Cast Iron (FC · FCD etc.)	-	-	-	-	★ 100
First *ap*(Radial)					under 0.3mm
Aluminium	-	-	-	-	★ 150~400
First *ap*(Radial)					under 0.3mm
Brass	-	-	-	-	★ 150~300
First *ap*(Radial)					under 0.3mm

★ : 1st Recommendation ☆ : 2nd Recommendation

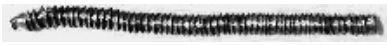
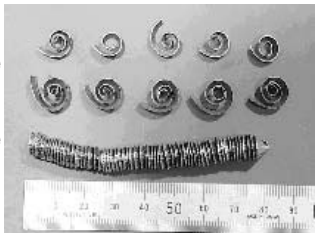
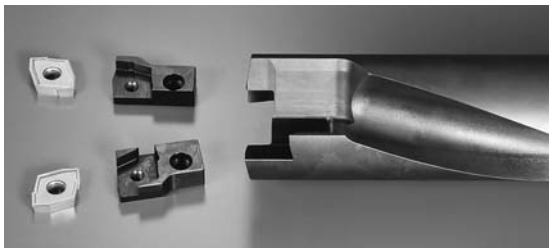
- Wet Cutting is recommended
- When using Cermet insert, applying Light Honing to the Cutting Edge by Hand Lapper brings stable Performance.
- When using TC40 Insert, set up a few more passes than tne chart of “Depth of Cut & Number of Pass”.
- When threading to Stainless Steel, set up a few more passes than the chart of “Depth of Cut & Number of Pass”.

Drilling

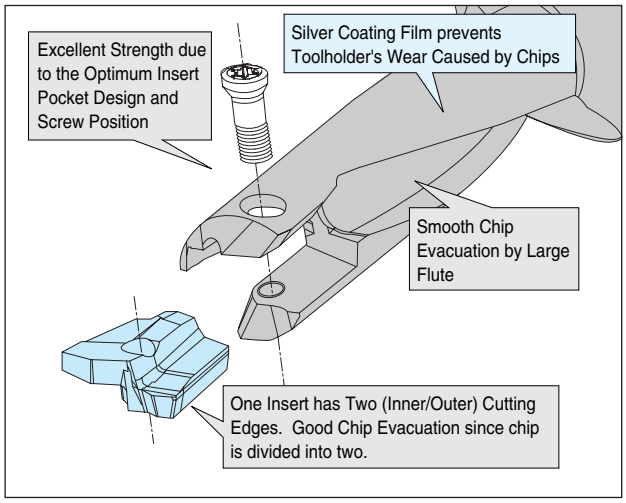
315～330

Product Lineup

■ Product Lineup

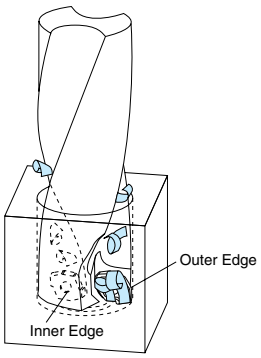
Description	Shape	Cutting Dia. (Cutting Depth)	Cutting Edge	Remark
DRS [Magic Drill Mini]	 Silver Cast Spec.	**ϕ10～ϕ12.5 (3.5D)**	Inner & Outer Edges on One Insert 	Chip Shape (Work Material: S50C) Cutting Dia. ϕ10 Chip from Outer Edge  Small Chips, Smooth Evacuation Chip from Inner Edge  Small Spiral Chips, Stable Evacuation
DRZ [Magic Drill]		**ϕ13～ϕ59 (2D,3D) ϕ13～ϕ50 (4D) ϕ27～ϕ50 (5D)**	Inner & Outer Edges on One type of Insert 	Chip Shape (Work Material: S50C) Cutting Dia. ϕ23 Chip from Outer Edge Chip from Inner Edge 
DRZ-CR [Magic Drill Cartridge] (Made to order)		**ϕ60～ (2D,3D,4D)**	Inner & Outer Edges on One type of Insert 	Structure 

■ DRS Magic Drill Mini

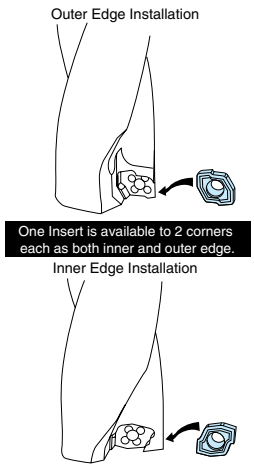


① Dia. 10mm drilling with indexable insert
② Inner & outer edges on one insert. Easy replacement. Small chips and good evacuation
③ High-speed stable machining and high efficiency
④ Productivity improvement and big cost reduction
⑤ Good bite and available for slant face without pre-drilling

■ DRZ Magic Drill

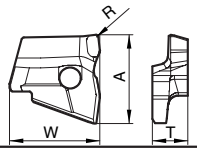
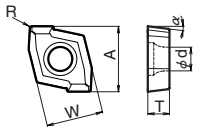
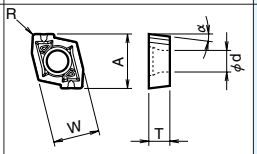
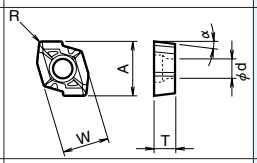
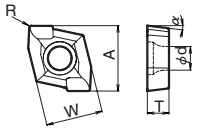


Chips are divided into total 3 pcs, 2 pcs from outer edge and 1 pc from inner edge.



① Cost reduction by 4-corner use insert
② Available for various workpiece with wide chipbreaker lineup
③ Special edge structure to divide chip into 3 pieces
④ Sharp cutting performance to avoid chattering. Good surface finish
⑤ Good chip evacuation, silent driling and low cutting force design

■ Drilling Inserts

Shape		Description		Dimension (mm) A	T	θ d	W	R	Angle (°) α	Insert Grade PVD Coated PR510	PR660	PR730	PR915	PR930	Carbide KW10	Ref. Page for Drill
		DS	100	8.8	3.5	–	9.0	0.2		●	●					
			105	9.3	3.7	–	9.7	0.2		●	●					
			110	9.8	3.9	–	10.0	0.2	–	●	●					318
			115	10.2	4.1	–	10.3	0.2		●	●					
			120	10.8	4.3	–	10.9	0.25		●	●					
		ZCMT	050203	5.9	2.38	2.3	5.0	0.3		●	●	●	●	●	●	
			06T204	7.0	2.80	2.5	6.0	0.4		●	●	●	●	●	●	
			080304	9.7	3.18	2.9	8.2	0.4		●	●	●	●	●	●	320～
			10T304	12.0	3.97	4.4	10.4	0.4	7°	●	●	●	●	●	●	325
			12T306	14.3	3.97	5.6	12.8	0.6		●	●	●	●	●	●	327
			150408	17.8	4.76	5.6	15.8	0.8		●	●	●	●	●	●	
			200608	22.8	6.35	6.5	20.3	0.8		●	●	●	●	●	●	
 For Stainless Steel		ZCMT	050203SU	5.9	2.38	2.3	5.0	0.3	7°		●	●		●		320～ 324
 For Stainless Steel		ZCMT	06T204SU	7.0	2.80	2.5	6.0	0.4	7°		●	●		●		320～ 324
 For Deep Drilling		ZCMT	050203SP	5.9	2.38	2.3	0.5	0.3	7°		●			●	●	
			06T204SP	7.0	2.80	2.5	0.6	0.4			●			●	●	
			080304SP	9.7	3.18	2.9	8.2	0.4			●			●	●	320～
			10T304SP	12.0	3.97	4.4	10.4	0.4			●			●	○	325
			12T304SP	14.3	3.97	5.6	12.8	0.4			●			●	●	
			150406SP	17.8	4.76	5.6	15.8	0.6			●			●	○	

■ Suitable Chipbreaker (ZCMT)

Work Material	Insert Size	ZCMT05									ZCMT06									ZCMT08					
	Chipbreaker	Standard			SU			SP			Standard			SU			SP			Standard			SP		
	Cutting Depth	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D
Low Carbon Steel (SS400,S15C,SCM415,SCr415)		☆	☆	-	-	-	-	★	★	★	☆	☆	-	☆	☆	☆	★	★	★	☆	☆	-	★	★	★
Carbon Steel (S45C)		★	★	☆	-	-	-	☆	☆	★	★	★	☆	-	-	-	☆	☆	★	★	★	☆	☆	☆	★
Alloy Steel (SCM435,SCr435)		★	★	☆	-	-	-	☆	☆	★	★	★	☆	-	-	-	☆	☆	★	★	★	☆	☆	☆	★
Die Steel (SKD11)		★	★	☆	-	-	-	☆	☆	★	★	★	☆	-	-	-	☆	☆	★	★	★	☆	☆	☆	★
Stainless Steel (SUS304,SUS430,SUS440F)		☆	☆	-	☆	☆	-	★	★	★	-	-	-	★	★	★	☆	☆	☆	☆	☆	-	★	★	★
Cast Iron (FC250,FCD400)		★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	☆	☆	☆
Non-ferrous Metal (A2017,A5052)		☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	★	★	★
Brass		★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	☆	☆	☆
Titanium Alloy		☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	★	★	★

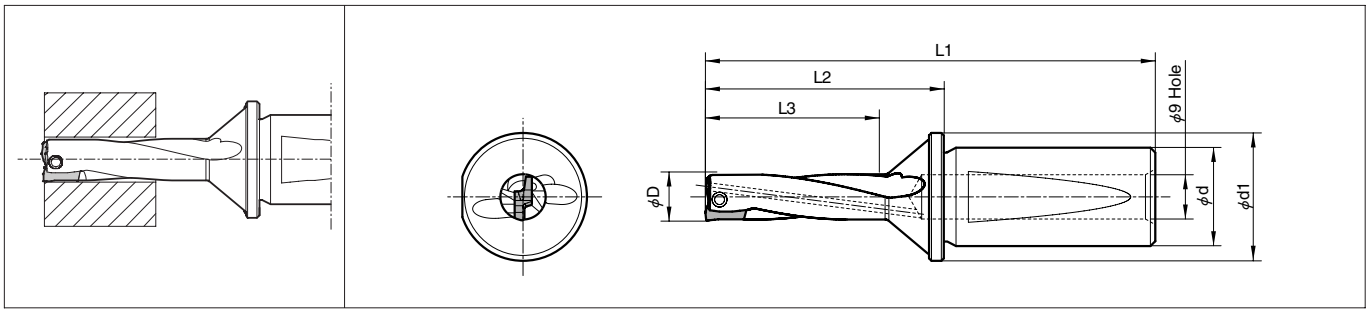
Work Material	Insert Size	ZCMT10						ZCMT12						ZCMT15						ZCMT20			
	Chipbreaker	Standard			SP			Standard			SP			Standard			SP			Standard			
	Cutting Depth	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	
Low Carbon Steel (SS400,S15C,SCM415,SCr415)		☆	☆	-	★	★	★	☆	☆	-	★	★	★	☆	☆	-	★	★	★	★	★	★	
Carbon Steel (S45C)		★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	☆	☆	★	
Alloy Steel (SCM435,SCr435)		★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	☆	☆	★	
Die Steel (SKD11)		★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	☆	☆	★	
Stainless Steel (SUS304,SUS430,SUS440F)		☆	☆	-	★	★	★	☆	☆	-	★	★	★	☆	☆	-	★	★	★	★	★	★	
Cast Iron (FC250,FCD400)		★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	
Non-ferrous Metal (A2017,A5052)		☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	★	★	★	
Brass		★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	
Titanium Alloy		☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	☆	☆	☆	★	★	★	★	★	★	

· At interrupted cutting, standard chipbreaker may function better.
· When machining aluminum, chips become long and hard to be discharged at the depth over 2D
· For 5D type, Refer to 4D type

★ : 1st Recommendation ☆ : 2st Recommendation

● : Std. Stock ○ : Check Availability

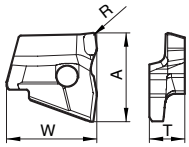
■ DRS



● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	L1	L2	L3	φd	φd1	Max. Offset (Radial)	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Wrench	Applicable Insert
S20 -DRS10035	●	1	10.0	92	49	35.0	20	26	+0.2	SB-2080TR	FT-6	–	DS100
-DRS10235	●	1	10.2	92	49	35.0	20	26	+0.2				
-DRS10336	●	1	10.3	92	49	36.0	20	26	+0.1				
-DRS10537	●	1	10.5	93	50	37.0	20	26	+0.2				DS105
-DRS11038	●	1	11.0	96	53	38.5	20	26	+0.2	SB-2290TR			DS110
-DRS11540	●	1	11.5	97	54	40.5	20	26	+0.2				DS115
-DRS12042	●	1	12.0	99	56	42.0	20	26	+0.4	SB-25100TR	–	DT-7	DS120
-DRS12544	●	1	12.5	101	58	44.0	20	26	+0.2				

● Applicable Insert

Shape		Description	Dimension (mm) A	T	φd	W	R	Angle (°) α	Insert Grade PVD Coated PR510	PR660	PR730	PR915	PR930	Carbide KW10
		DS 100	8.8	3.5	–	9.0	0.2	–	●	●				
		105	9.3	3.7	–	9.7	0.2	–	●	●				
		110	9.8	3.9	–	10.0	0.2	–	●	●				
		115	10.2	4.1	–	10.3	0.2	–	●	●				
		120	10.8	4.3	–	10.9	0.25	–	●	●				

◆ Recommended Cutting Conditions (Wet)

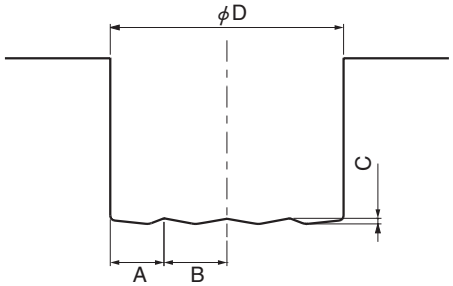
Work Material	Recommended Grade (V_C m/min) PVD Coated PR510	PR660	f (mm/rev.)
Low Carbon Steel (SS400,S15C etc.)		★ 80~100	0.06
Carbon Steel (S45C etc.)		★ 80~100	0.08~0.1
Alloy Steel (SCM,SCr etc.)		★ 80	0.04~0.06
Die Steel (SKD,NAK etc.)		★ 80	0.04~0.06
Stainless Steel (Austenitic)		★ 70~80	0.05~0.06
Cast Iron (FC)	★ 80~100		0.08~0.1

★ : 1st Recommendation

1. Apply sufficient amount of coolant
2. If decreasing the cutting speed too much from above condition, chip evacuation will be deteriorated.
   If increasing the feed rate too much beyond above condition, chip evacuation from inner edge will be deteriorated.
   If decreasing the feed rate too much from above condition, chip evacuation from outer edge will be deteriorated.
3. If chips become long and are entangled with the tool at low carbon steel cutting, increase the cutting speed to 120-150m/min.
   If still not solved, try peck feeding.
   [Peck Feeding] (1) Cut 1-2mm (2) Return 1mm (3) Repeat (1) and (2)

◆ Magic Drill Mini (DRS) Hole Bottom Shape

φD	A	B	C
10.0	2.2	2.80	0.2
10.2	2.2	2.90	0.2
10.3	2.3	2.85	0.2
10.5	2.3	2.95	0.2
11.0	2.4	3.10	0.2
11.5	2.5	3.25	0.2
12.0	2.8	3.20	0.3
12.5	2.9	3.35	0.4

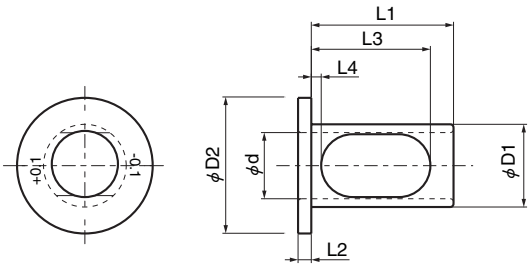


● : Std. Stock ○ : Check Availability

Adjustable Sleeve [for DRS Magic Drill Mini]

■ SHEM

Diameter Adjustment



● Sleeve Dimension

Description	Stock	Dimension (mm)							Dia. Adjustment Range
		φd	φD1	φD2	L1	L2	L3	L4	
SHEM 2025-43	●	20	25	41	43	4	36	3.0	+0.1, –0.1
2032-43	○	20	32	49	43	6	36	2.5	+0.1, –0.1

· Dia. Adjustment Range adjusts the cutting diameter.

◆ How to Use

· SHEM-type is dedicated for Magic Drill Mill (DRS-type) only.
· SHEM-type is available for cutting diameter adjustment only. (up to +0.1mm or -0.1mm)
· SHEM-type is not available for center height adjustment like conventional SHE-type.
· Apply SHEM-type when adjusting the cutting diameter at pre-drilling before threading.

①Set the outer edge horizontally with 90° to the marking line on the sleeve (Fig.1)
②To adjust to a larger diameter, align the +0.1 mark on the sleeve with the flat on the drill shank. To adjust to a smaller diameter, align the -0.1 mark on the sleeve with the flat on the drill shank.
③Tighten the bottom screw firmly which is directly toughing the holder dill. Slightly tighten the upper screw which is directly touching the sleeve.

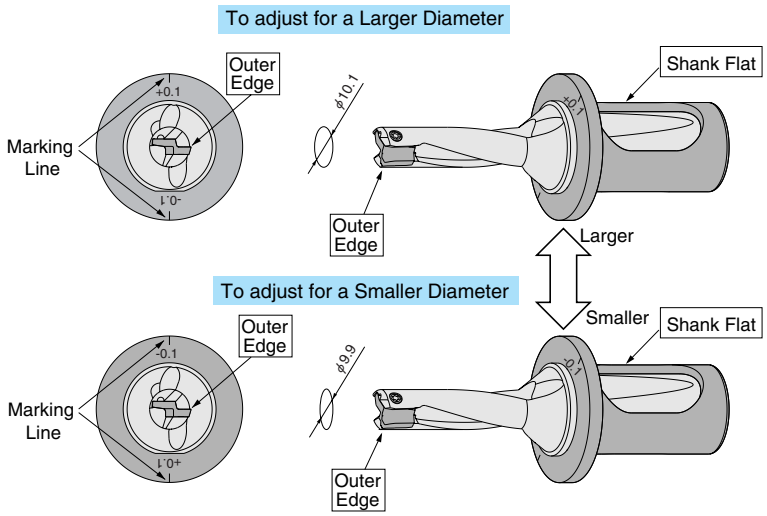


Fig.1 Diameter Adjustment Method (e.g.)φ10 Drill

Caution: Not Available to Collet Chuck type Arbor

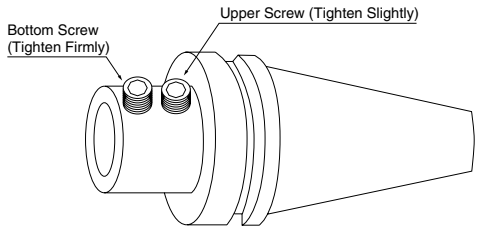
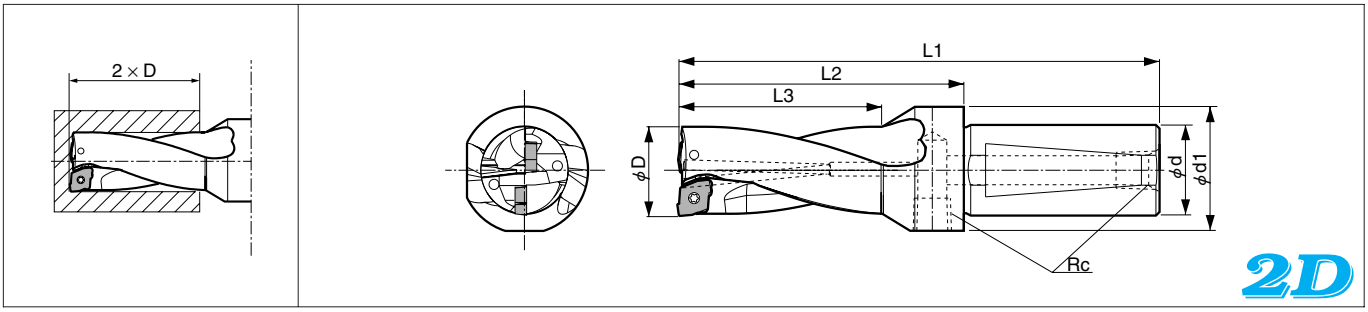


Fig. 2

DRZ (Cutting Depth : 2 × D)



● Toolholder Dimension

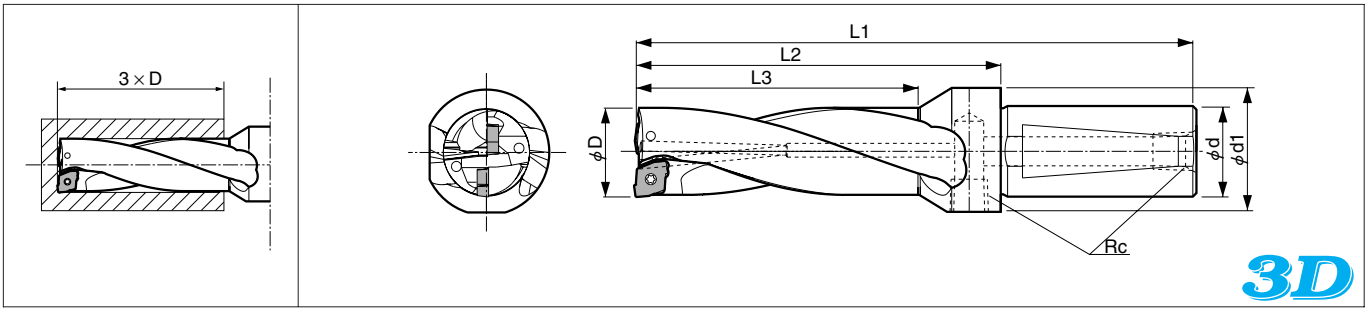
Description	Stock	No. of Insert	Dimension (mm) φD	L1	L2	L3	φd	φd1	Rc	Max. Offset (Radial)	Spare Parts: Clamp Screw	Wrench	Plug	Applicable Insert ➡ P.317
S20-DRZ1326-05	●		13	95	52	26		27		+0.5				ZCMT050203
-DRZ1428-05	●	2	14	98	55	28	20	27	Rc1/8	+0.5	SB-2045TR	FT-6	GP-1	ZCMT050203SU
-DRZ1530-05	●		15	100	57	30		27		+0.5				ZCMT050203SP
S25-DRZ1632-06	●		16	115	61	32		32		+1.1				
-DRZ1734-06	●		17	116	62	34		32		+0.8				
-DRZ1836-06	●		18	118	64	36		32		+0.6				ZCMT06T204
-DRZ1938-06	●	2	19	120	66	38	25	32	Rc1/8	+0.5	SB-2260TR	DT-7	GP-1	ZCMT06T204SU
-DRZ2040-06	●		20	123	69	40		32		+0.5				ZCMT06T204SP
-DRZ2142-06	●		21	125	71	42		32		+0.2				
-DRZ2244-08	●		22	128	74	44		33		+1.6				
-DRZ2346-08	●		23	130	76	46		33		+1.3				
-DRZ2448-08	●	2	24	131	77	48	25	35	Rc1/8	+1.1	SB-2570TR	DT-8	GP-1	ZCMT080304
-DRZ2550-08	●		25	133	79	50		35		+0.8				ZCMT080304SP
-DRZ2652-08	●		26	135	81	52		35		+0.6				
S32-DRZ2754-10	●		27	149	90	54		42		+2.5				
-DRZ2856-10	●		28	151	92	56		42		+2.2				
-DRZ2958-10	●		29	153	94	58		42		+2.0				ZCMT10T304
-DRZ3060-10	●	2	30	154	95	60	32	45	Rc1/4	+1.7	SB-4085TR	DT-15	GP-2	ZCMT10T304SP
-DRZ3162-10	●		31	155	96	62		45		+1.5				
-DRZ3264-10	●		32	158	99	64		45		+1.2				
-DRZ4080-12	●	2	40	175	116	80	32	55	Rc1/4	+1.2	SB-5085TR	DT-20	GP-2	ZCMT12T306 ZCMT12T304SP
S40-DRZ3366-12	●		33	173	104	66		55		+2.9				
-DRZ3468-12	●		34	176	107	68		55		+2.7				
-DRZ3570-12	●		35	177	108	70		55		+2.4				
-DRZ3672-12	●		36	180	111	72		55		+2.2				ZCMT12T306
-DRZ3774-12	●	2	37	181	112	74	40	55	Rc1/4	+1.9	SB-5085TR	DT-20	GP-2	ZCMT12T304SP
-DRZ3876-12	●		38	183	114	76		55		+1.7				
-DRZ3978-12	●		39	185	116	78		55		+1.4				
-DRZ4080-12	●		40	185	116	80		55		+1.2				
-DRZ4182-15	●		41	186	117	82		55		+4.0				
-DRZ4284-15	●		42	188	119	84		55		+3.7				
-DRZ4386-15	●		43	190	121	86		55		+3.5				
-DRZ4488-15	●		44	192	123	88		55		+3.2				
-DRZ4590-15	●		45	192	123	90		55		+3.0				
-DRZ4692-15	●		46	198	129	92		60		+2.7				
-DRZ4794-15	●	2	47	201	132	94	40	60	Rc1/4	+2.5	SB-5085TR	DT-20	GP-2	ZCMT150408
-DRZ4896-15	●		48	203	134	96		60		+2.2				ZCMT150406SP
-DRZ4998-15	●		49	204	135	98		60		+2.0				
-DRZ50100-15	●		50	204	135	100		60		+1.7				
-DRZ51102-15	●		51	205	136	102		60		+1.2				
-DRZ52104-15	●		52	205	136	104		60		+1.0				
-DRZ53106-15	●		53	208	139	106		60		+0.7				
-DRZ54108-20	●		54	214	145	108		65		+5.0				
-DRZ55110-20	●		55	215	146	110		65		+4.7				
-DRZ56112-20	●		56	217	148	112		65		+4.4				
-DRZ57114-20	●	2	57	219	150	114	40	65	Rc1/4	+4.1	SB-60130TR	DT-25	GP-2	ZCMT200608
-DRZ58116-20	●		58	221	152	116		65		+3.8				
-DRZ59118-20	●		59	223	154	118		65		+3.5				

· When Offset machining, reduce Feed Rate to less than f=0.08mm/rev.

Recommended Cutting Conditions ➡ P.330

● : Std. Stock ○ : Check Availability

DRZ (Cutting Depth : 3 × D)



● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	L1	L2	L3	φd	φd1	Rc	Max. Offset (Radial)	Spare Parts: Clamp Screw	Wrench	Plug	Applicable Insert ➡ P.317
S20 -DRZ1339-05	●		13	108	65	39		27		+0.5				
-DRZ135405-05	●		13.5	108	65	40.5		27		+0.5				
-DRZ1442-05	●	2	14	112	69	42	20	27	Rc1/8	+0.5	SB-2045TR	FT-6	GP-1	ZCMT050203 ZCMT050203SU ZCMT050203SP
-DRZ145435-05	●		14.5	112	69	43.5		27		+0.5				
-DRZ1545-05	●		15	115	72	45		27		+0.5				
-DRZ155465-05	●		15.5	115	72	46.5		27		+0.5				
S25 -DRZ1648-06	●		16	131	77	48		32		+1.1				
-DRZ165495-06	●		16.5	131	77	49.5		32		+0.9				
-DRZ1751-06	●		17	133	79	51		32		+0.8				
-DRZ175525-06	●		17.5	133	79	52.5		32		+0.7				
-DRZ1854-06	●		18	136	82	54		32		+0.6				
-DRZ185555-06	●	2	18.5	136	82	55.5	25	32	Rc1/8	+0.6	SB-2260TR	DT-7	GP-1	ZCMT06T204 ZCMT06T204SU ZCMT06T204SP
-DRZ1957-06	●		19	139	85	57		32		+0.5				
-DRZ195585-06	●		19.5	139	85	58.5		32		+0.5				
-DRZ2060-06	●		20	143	89	60		32		+0.5				
-DRZ205615-06	●		20.5	146	92	61.5		32		+0.3				
-DRZ2163-06	●		21	146	92	63		32		+0.2				
-DRZ215645-08	●		21.5	147	93	64.5		33		+1.8				
-DRZ2266-08	●		22	147	93	66		33		+1.6				
-DRZ225675-08	●		22.5	147	93	67.5		33		+1.4				
-DRZ2369-08	●		23	150	96	69		33		+1.3				
-DRZ235705-08	●		23.5	150	96	70.5		33		+1.2				
-DRZ2472-08	●	2	24	152	98	72	25	35	Rc1/8	+1.1	SB-2570TR	DT-8	GP-1	ZCMT080304 ZCMT080304SP
-DRZ245735-08	●		24.5	152	98	73.5		35		+0.9				
-DRZ2575-08	●		25	155	101	75		35		+0.8				
-DRZ255765-08	●		25.5	155	101	76.5		35		+0.7				
-DRZ2678-08	●		26	158	104	78		35		+0.6				
-DRZ265795-08	●		26.5	158	104	79.5		35		+0.5				
S32 -DRZ2781-10	●		27	173	114	81		42		+2.5				
-DRZ275825-10	●		27.5	173	114	82.5		42		+2.3				
-DRZ2884-10	●		28	176	117	84		42		+2.2				
-DRZ285855-10	●		28.5	176	117	85.5		42		+2.1				
-DRZ2987-10	●		29	179	120	87		42		+2.0				
-DRZ295885-10	●	2	29.5	179	120	88.5	32	45	Rc1/4	+1.8	SB-4085TR	DT-15	GP-2	ZCMT10T304 ZCMT10T304SP
-DRZ3090-10	●		30	181	122	90		45		+1.7				
-DRZ305915-10	●		30.5	181	122	91.5		45		+1.5				
-DRZ3193-10	●		31	183	124	93		45		+1.5				
-DRZ315945-10	●		31.5	183	124	94.5		45		+1.3				
-DRZ3296-10	●		32	187	128	96		45		+1.2				
-DRZ325975-10	●		32.5	187	128	97.5		45		+1.0				
-DRZ3399-12	●		33	193	134	99		55		+2.9				
-DRZ34102-12	●		34	197	138	102		55		+2.7				
-DRZ35105-12	●		35	199	140	105		55		+2.4				
-DRZ36108-12	●	2	36	203	144	108	32	55	Rc1/4	+2.2	SB-5085TR	DT-20	GP-2	ZCMT12T306 ZCMT12T304SP
-DRZ37111-12	●		37	205	146	111		55		+1.9				
-DRZ38114-12	●		38	208	149	114		55		+1.7				
-DRZ39117-12	●		39	211	152	117		55		+1.4				
-DRZ40120-12	●		40	212	153	120		55		+1.2				

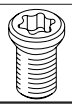
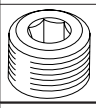
· When Offset machining, reduce Feed Rate to less than f=0.08mm/rev.

Recommended Cutting Conditions ➡ P.330

● : Std. Stock ○ : Check Availability

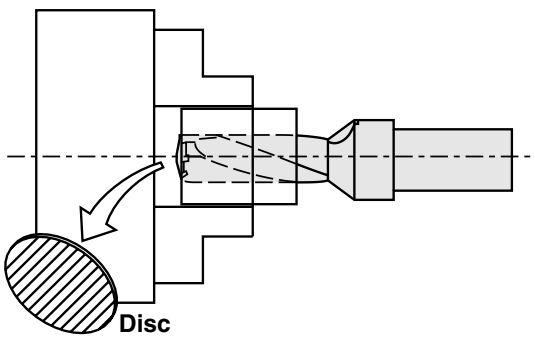
Magic Drill

3 × D Type

Description	Stock	No. of Insert	Dimension (mm)							Max. Offset (Radial)	Spare Parts			Applicable Insert
											Clamp Screw	Wrench	Plug	
			ϕD	L1	L2	L3	ϕd	ϕd1	Rc					P.317
S40 -DRZ3399-12	●	2	33	203	134	99	40	55	Rc1/4	+2.9	SB-5085TR	DT-20	GP-2	ZCMT12T306 ZCMT12T304SP
-DRZ34102-12	●	2	34	207	138	102	40	55		+2.7				
-DRZ35105-12	●	2	35	209	140	105	40	55		+2.4				
-DRZ36108-12	●	2	36	213	144	108	40	55		+2.2				
-DRZ37111-12	●	2	37	215	146	111	40	55		+1.9				
-DRZ38114-12	●	2	38	218	149	114	40	55		+1.7				
-DRZ39117-12	●	2	39	221	152	117	40	55		+1.4				
-DRZ40120-12	●	2	40	222	153	120	40	55		+1.2				
-DRZ41123-15	●	2	41	224	155	123	40	55	Rc1/4	+4.0	SB-5085TR	DT-20	GP-2	ZCMT150408 ZCMT150406SP
-DRZ42126-15	●	2	42	227	158	126	40	55		+3.7				
-DRZ43129-15	●	2	43	230	161	129	40	55		+3.5				
-DRZ44132-15	●	2	44	233	164	132	40	55		+3.2				
-DRZ45135-15	●	2	45	234	165	135	40	55		+3.0				
-DRZ46138-15	●	2	46	241	172	138	40	60		+2.7				
-DRZ47141-15	●	2	47	245	176	141	40	60		+2.5				
-DRZ48144-15	●	2	48	248	179	144	40	60		+2.2				
-DRZ49147-15	●	2	49	250	181	147	40	60		+2.0				
-DRZ50150-15	●	2	50	250	182	150	40	60		+1.7				
-DRZ51153-15	●	2	51	254	185	153	40	60		+1.2				
-DRZ52156-15	●	2	52	257	188	156	40	60		+1.0				
-DRZ53159-15	●	2	53	260	191	159	40	60		+0.7				
-DRZ54162-20	●	2	54	266	197	162	40	65	Rc1/4	+5.0	SB-60130TR	DT-20	GP-2	ZCMT200608
-DRZ55165-20	●	2	55	269	200	165	40	65		+4.7				
-DRZ56168-20	●	2	56	272	203	168	40	65		+4.4				
-DRZ57171-20	●	2	57	275	206	171	40	65		+4.1				
-DRZ58174-20	●	2	58	278	209	174	40	65		+3.8				
-DRZ59177-20	●	2	59	281	212	177	40	65		+3.5				

Recommended Cutting Conditions P.330

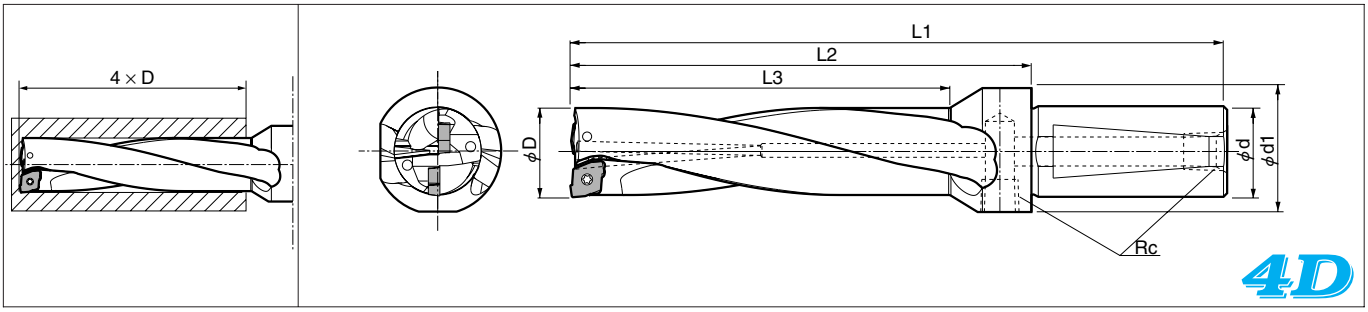
◆ Caution



At through hole machining, a disk may fly out from the machine in some cases.
The safety cover is necessary when using a conventional lathe and so on without cover.

● : Std. Stock ○ : Check Availability

DRZ (Cutting Depth : 4 × D)



● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) ϕD	L1	L2	L3	ϕd	ϕd1	Rc	Max. Offset (Radial)	Spare Parts: Clamp Screw	Wrench	Plug	Applicable Insert ➡ P.317
S20 -DRZ1352-05	●		13	121	78	52		27		+0.5				
-DRZ135540-05	●		13.5	123	79	54		27		+0.5				
-DRZ1456-05	●	2	14	126	83	56	20	27	Rc1/8	+0.5	SB-2045TR	FT-6	GP-1	ZCMT050203 ZCMT050203SU ZCMT050203SP
-DRZ145580-05	●		14.5	127	84	58		27		+0.5				
-DRZ1560-05	●		15	130	87	60		27		+0.5				
-DRZ155620-05	●		15.5	131	88	62		27		+0.5				
S25 -DRZ1664-06	●		16	147	93	64		32		+1.1				
-DRZ165660-06	●		16.5	146	93	66		32		+0.9				
-DRZ1768-06	●		17	149	95	68		32		+0.8				
-DRZ175700-06	●		17.5	147	97	70		32		+0.7				
-DRZ1872-06	●		18	153	99	72		32		+0.6				
-DRZ185740-06	●	2	18.5	155	101	74	25	32	Rc1/8	+0.6	SB-2260TR	DT-7	GP-1	ZCMT06T204 ZCMT06T204SU ZCMT06T204SP
-DRZ1976-06	●		19	157	103	76		32		+0.5				
-DRZ195780-06	●		19.5	159	105	78		32		+0.5				
-DRZ2080-06	●		20	156	102	80		32		+0.5				
-DRZ205820-06	●		20.5	163	113	82		32		+0.2				
-DRZ2184-06	●		21	161	107	84		32		+0.2				
-DRZ215860-08	●		21.5	169	115	86		33		+1.8				
-DRZ2288-08	●		22	169	115	88		33		+1.6				
-DRZ225900-08	●		22.5	169	115	90		33		+1.4				
-DRZ2392-08	●		23	173	119	92		33		+1.3				
-DRZ235940-08	●		23.5	173	118	94		33		+1.0				
-DRZ2496-08	●	2	24	176	122	96	25	35	Rc1/8	+1.1	SB-2570TR	DT-8	GP-1	ZCMT080304 ZCMT080304SP
-DRZ245980-08	●		24.5	177	123	98		35		+0.9				
-DRZ25100-08	●		25	180	126	100		35		+0.8				
-DRZ2551020-08	●		25.5	181	127	102		36		+0.7				
-DRZ26104-08	●		26	184	130	104		35		+0.6				
-DRZ2651060-08	●		26.5	185	131	106		35		+0.5				
S32 -DRZ27108-10	●		27	200	141	108		42		+2.5				
-DRZ2751100-10	●		27.5	201	142	110		42		+2.3				
-DRZ28112-10	●		28	204	145	112		42		+2.2				
-DRZ1851140-10	●		28.5	204	146	114		42		+2.1				
-DRZ29116-10	●		29	208	149	116		42		+2.0				
-DRZ2951180-10	●	2	29.5	209	150	118	32	42	Rc1/4	+1.8	SB-4085TR	DT-15	GP-2	ZCMT10T304 ZCMT10T304SP
-DRZ30120-10	●		30	211	152	120		45		+1.7				
-DRZ3051220-10	●		30.5	212	153	122		45		+1.6				
-DRZ31124-10	●		31	214	155	124		45		+1.5				
-DRZ3151260-10	●		31.5	216	157	126		45		+1.3				
-DRZ32128-10	●		32	219	160	128		45		+1.2				
-DRZ3251300-10	●		32.5	220	161	130		45		+1.1				
-DRZ33132-12	●		33	236	167	132		55		+2.9				
-DRZ34136-12	●		34	231	172	136		55		+2.7				
-DRZ35140-12	●		35	234	175	140		55		+2.4				
-DRZ36144-12	●		36	239	180	144		55		+2.2				
-DRZ37148-12	●	2	37	242	183	148	32	55	Rc1/4	+1.9	SB-5085TR	DT-20	GP-2	ZCMT12T306 ZCMT12T304SP
-DRZ38152-12	●		38	246	187	152		55		+1.7				
-DRZ39156-12	●		39	250	191	156		55		+1.4				
-DRZ40160-12	●		40	252	193	160		55		+1.2				

· When Offset machining, reduce Feed Rate to less than f=0.08mm/rev.

Recommended Cutting Conditions ➡ P.330

● : Std. Stock ○ : Check Availability

Magic Drill

4 × D Type

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	L1	L2	L3	φd	φd1	Rc	Max. Offset (Radial)	Spare Parts: Clamp Screw	Wrench	Plug	Applicable Insert ➡ P.317
S40 -DRZ33132-12	●	2	33	236	167	132	40	55		+2.9				
-DRZ34136-12	●	2	34	241	172	136	40	55		+2.7				
-DRZ35140-12	●	2	35	244	175	140	40	55		+2.4				
-DRZ36144-12	●	2	36	249	180	144	40	55		+2.2				
-DRZ37148-12	●	2	37	252	183	148	40	55	Rc1/4	+1.9	**SB-5085TR**	**DT-20**	**GP-2**	ZCMT12T306 ZCMT12T304SP
-DRZ38152-12	●	2	38	256	187	152	40	55		+1.7				
-DRZ39156-12	●	2	39	260	191	156	40	55		+1.4				
-DRZ40160-12	●	2	40	262	193	160	40	55		+1.2				
-DRZ41164-15	●	2	41	265	196	164	40	55		+4.0				
-DRZ42168-15	●	2	42	269	200	168	40	55		+3.7				
-DRZ43172-15	●	2	43	273	204	172	40	55		+3.5				
-DRZ44176-15	●	2	44	277	208	176	40	55		+3.2				
-DRZ45180-15	●	2	45	279	210	180	40	55		+3.0				
-DRZ46184-15	●	2	46	287	218	184	40	60	Rc1/4	+2.7	**SB-5085TR**	**DT-20**	**GP-2**	ZCMT150408 ZCMT150406SP
-DRZ47188-15	●	2	47	292	223	188	40	60		+2.5				
-DRZ48192-15	●	2	48	296	227	192	40	60		+2.2				
-DRZ49196-15	●	2	49	300	231	196	40	60		+2.0				
-DRZ50200-15	●	2	50	301	232	200	40	60		+1.7				

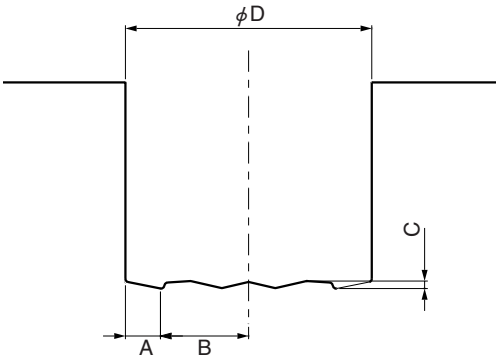
· When Offset machining, reduce Feed Rate to less than f=0.08mm/rev.

Recommended Cutting Conditions ➡ P.330

◆ Magic Drill (DRZ) Hole Bottom Shape

(mm)

φD	A	B	C	φD	A	B	C	φD	A	B	C
13.0	2.1	4.4	0.4	21.5	3.1	7.7	0.6	33.0	5.7	10.8	0.8
13.5		4.7	0.4	22.0		7.9	0.6	34.0		11.3	0.8
14.0		4.9	0.4	22.5		8.2	0.6	35.0		11.8	0.8
14.5		5.2	0.4	23.0		8.4	0.6	36.0		12.3	0.8
15.0		5.4	0.5	23.5		8.7	0.6	37.0		12.8	0.8
15.5		5.7	0.5	24.0		8.9	0.7	38.0		13.3	0.9
16.0	2.7	5.3	0.6	24.5		9.2	0.7	39.0		13.8	0.9
16.5		5.6	0.6	25.0		9.4	0.7	40.0		14.3	0.9
17.0		5.8	0.6	25.5		9.7	0.7	41.0	6.5	14.0	1.0
17.5		6.1	0.6	26.0		9.9	0.7	42.0		14.5	1.0
18.0		6.3	0.6	26.5		10.2	0.7	43.0		15.0	1.0
18.5		6.6	0.7	27.0	3.1	9.5	0.7	44.0		15.5	1.0
19.0		6.8	0.7	27.5		9.8	0.7	45.0		16.0	1.0
19.5		7.1	0.7	28.0		10.0	0.7	46.0		16.5	1.0
20.0		7.3	0.7	28.5		10.3	0.7	47.0		17.0	1.0
20.5		7.6	0.7	29.0		10.5	0.7	48.0		17.5	1.1
21.0		7.8	0.8	29.5		10.8	0.7	49.0		18.0	1.1
				30.0		11.0	0.7	50.0		18.5	1.1
				30.5		11.3	0.7	51.0	6.5	19.0	1.1
				31.0		11.5	0.8	52.0		19.5	1.1
				31.5		11.8	0.8	53.0		20.0	1.1
				32.0		12.0	0.8	54.0	8.5	18.5	1.2
				32.5		12.3	0.8	55.0		19.0	1.2
								56.0		19.5	1.2
								57.0		20.0	1.2
								58.0		20.5	1.2
								59.0		21.0	1.2

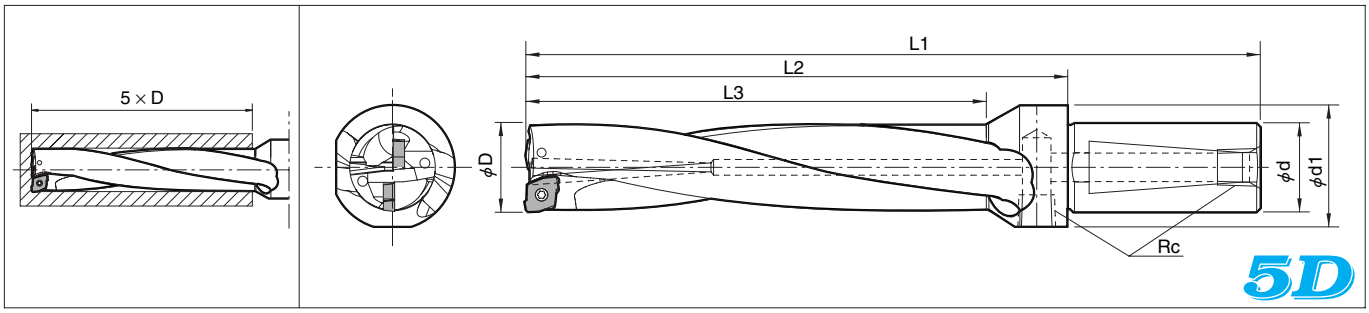


Available for 2×D, 3×D, 4×D and 5×D type

※Above figure is a standard one.
(Varies from -0.1mm to +0.1mm depending on work material and cutting conditions)

● : Std. Stock ○ : Check Availability

■ DRZ (Cutting Depth : 5 × D)



● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	L1	L2	L3	φd	φd1	Rc	Max. Offset (Radial)	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Plug	Applicable Insert ➡ P.317
S32 -DRZ27135-10	●		27	227	168	135		42		+ 2.5				
-DRZ28140-10	●		28	232	173	140		42		+ 2.2				
-DRZ29145-10	●	2	29	237	178	145	32	42	Rc1/4	+ 2.0	SB-4085TR	DT-15	GP-2	ZCMT10T304
-DRZ30150-10	●		30	241	182	150		45		+ 1.7				ZCMT10T304SP
-DRZ31155-10	●		31	245	186	155		45		+ 1.5				
-DRZ32160-10	●		32	251	192	160		45		+ 1.2				
S40 -DRZ33165-12	●		33	269	200	165		55		+ 2.9				
-DRZ34170-12	●		34	275	206	170		55		+ 2.7				
-DRZ35175-12	●		35	279	210	175		55		+ 2.4				
-DRZ36180-12	●		36	285	216	180		55		+ 2.2				
-DRZ37185-12	●	2	37	289	220	185	40	55	Rc1/4	+ 1.9	SB-5085TR	DT-20	GP-2	ZCMT12T306
-DRZ38190-12	●		38	294	225	190		55		+ 1.7				ZCMT12T304SP
-DRZ39195-12	●		39	299	230	195		55		+ 1.4				
-DRZ40200-12	●		40	302	233	200		55		+ 1.2				
-DRZ41205-15	●		41	306	237	205		55		+ 4.0				
-DRZ42210-15	●		42	311	242	210		55		+ 3.7				
-DRZ43215-15	●		43	316	247	215		55		+ 3.5				
-DRZ44220-15	●		44	321	252	220		55		+ 3.2				
-DRZ45225-15	●	2	45	324	255	225	40	55	Rc1/4	+ 3.0	SB-5085TR	DT-20	GP-2	ZCMT150408
-DRZ46230-15	●		46	333	264	230		60		+ 2.7				ZCMT150406SP
-DRZ47235-15	●		47	339	270	235		60		+ 2.5				
-DRZ48240-15	●		48	344	275	240		60		+ 2.2				
-DRZ49245-15	●		49	349	280	245		60		+ 2.0				
-DRZ50250-15	●		50	351	282	250		60		+ 1.7				

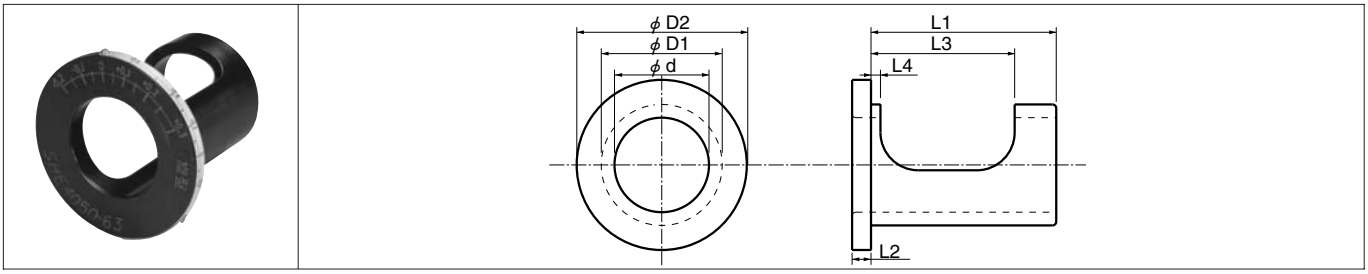
· When Offset machining, reduce Feed Rate to less than f=0.08mm/rev.

Recommended Cutting Conditions ➡ P.330

Adjustable Sleeve [for DRZ Magic Drill]

■ SHE

Diameter Adjustment / Center Height Adjustment

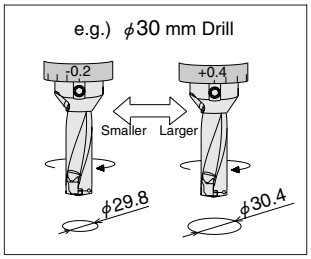


● Sleeve Dimension

Description	Stock	Dimension (mm)							※ Dia. Adjustment Range	Center Height Adjustment Range
		φd	φD1	φD2	L1	L2	L3	L4		
SHE 2025-43	●	20	25	41	43	4	36	3.0	+0.4~-0.2	+0.2~-0.15
2532-48	●	25	32	49	48	6	38	2.5	+0.4~-0.2	+0.2~-0.15
3240-53	●	32	40	58	53	6	43	2.5	+0.4~-0.2	+0.2~-0.15
4050-63	●	40	50	74	63	6	49	3.0	+0.6~-0.2	+0.3~-0.2

· Dia. Adjustment Range adjusts the cttuing diameter.
· SHE-type is dedicated for Magic Drill (DRZ-type). Not recommended to Magic Drill Mini (DRS-type) since the adjustment stroke is too large.

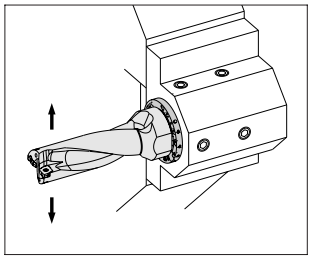
1. Diameter Adjustment –For Machining Center–



● Diameter Adjustment Range (mm)

Shank Dia.	Cutting Dia.	Range
φ20	φ13~15	+0.4~–0.2
φ25	φ16~26	
φ32	φ27~40	
φ40	φ33~50	+0.6~–0.2

2. Center Height Adjustment –For Lathe Operation–



● Center Height Adjustment Range (mm)

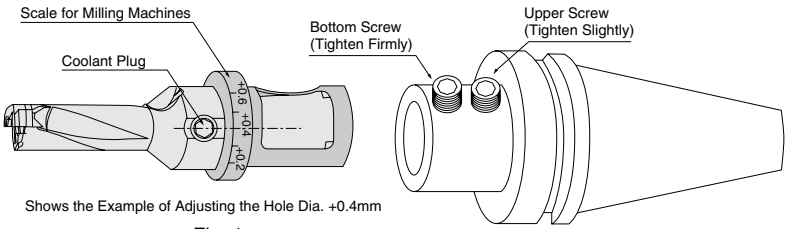
Shank Dia.	Cutting Dia.	Range
φ20	φ13~15	+0.2~–0.15
φ25	φ16~26	
φ32	φ27~40	
φ40	φ33~50	+0.3~–0.2

◆ How to Use the Adjustable Sleeve

1. Hole Diameter Adjustment at Drilling Machine

① Align the scale at the flange periphery of the sleeve to the center of the coolant plug of the drill (Fig. 1)
② When making the hole diameter bigger, rotate the sleeve to (+) direction and to make it smaller, rotate the sleeve to (–) direction
③ When rotating the sleeve, insert the wrench attached to the drill into the hole at the flange periphery and rotate the sleeve
④ Using the bottom screw of the side-lock arbor, firmly tignten the drill directly through the sleeve's window. The upper screw shall be used to slightly tighten the sleeve so that it will not be damaged (Fig. 2)

Caution) Not available to Collet Chuck-type Arbor
Scale on the sleeve is the standard value.
Check the actual cutting diameter after adjusting.



Shows the Example of Adjusting the Hole Dia. +0.4mm

Fig. 1

Fig. 2

2. Center-Height Adjustment at Turning Lathe

Most of the troubles at the turning lathe are based on the center-height deviation.
The center-height is appropriate, if the core of around 0.5mm diameter remains at the center of the end face (Fig.3)
Center-height adjustment is necessary for the case as follows:

◆No Core remains
◆Core Diameter is more than 1mm

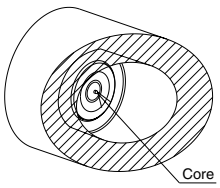


Fig. 3

① Set the drill as the outer insert face becomes parallel to the X-axis of the tool turret (Fig. 4)
② Align the scale (for the lathe) at the flange face of the sleeve to the center of the drill coolant plug
③ When no core remains, rotate the sleeve to (+) direction, and when the core diameter is more than 1mm, rotate the sleeve to (–) direction
④ When rotating the sleeve, insert the wrench attached to the drill into the hole at the flange periphery and rotate the sleeve
⑤ Using the tool holding screw of the lathe, tighten the drill directly through the sleeve's window.

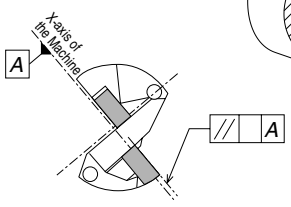


Fig. 4

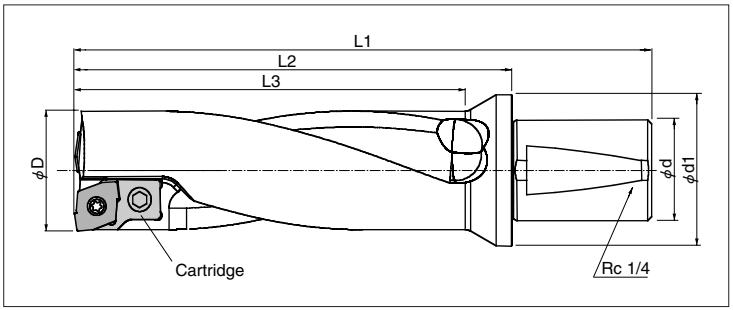
Note: According to the center-height adjustment, the hole diameter may change.
It is recommended that the hole diameter is checked after the center-height adjustment.

● : Std. Stock ○ : Check Availability

Magic Drill for Large Dia. (ϕ60～)

- **Magic Drill for Large Diameter (over 60mm) is available at Custom Order base. (Ask Your Regional Sales Staff for Details)**
- **Cartridge-type Drill (DRZ-CR) for over ϕ60mm**

■ DRZ-CR

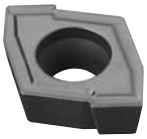
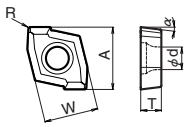


● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) ϕD	L1	L2	L3	ϕd	ϕd1	Max. Offset (Radial)	Spare Parts: Cartridge For Outer Edge	Cartridge For Inner Edge	Clamp Screw	Wrench	Applicable Insert
S40 -DRZ60180-20CR	●	2	60	286	217	195	40	75	+3.0	DR20CR-OUT	DR20CR-IN	SB-60120TR	DT-25	ZCMT200608
-DRZ65195-20CR	●	2	65	296	227	206			+1.5					
-DRZ70210-20CR	●	2	70	308	239	220			+0.2					
S50 -DRZ60180-20CR	△	2	60	286	217	195	50	75	+3.0	DR20CR-OUT (1 pc)	DR20CR-IN (1 pc)	SB-60120TR	DT-25	ZCMT200608
-DRZ65195-20CR	△	2	65	296	227	206			+1.5					
-DRZ70210-20CR	△	2	70	308	239	220			+0.2					
S50 -DRZ75225-12CR	△	4	75	330	261	225	50	80	No offset	DR12CR-OUT (2 pcs)	DR12CR-IN (2 pcs)	SB-5085TR	DT-20	ZCMT12T306
-DRZ80240-12CR	△	4	80	340	271	240								

Recommended Cutting Conditions ➡ P.330

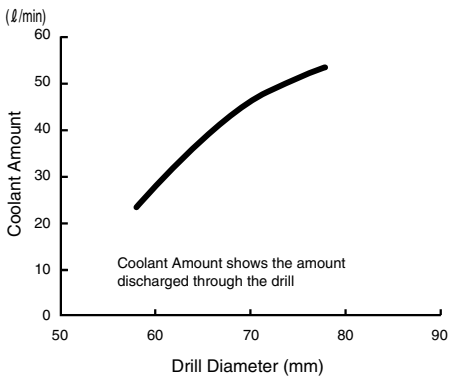
● Applicable Insert

Shape		Description	Dimension (mm) A	T	ϕd	W	R	Angle (°) α	Insert Grade PVD Coated PR510	PR660	PR730	PR915 NEW	PR930	Carbide KW10
		ZCMT12T306	14.3	3.97	5.6	12.8	0.6	7°	●	●	●	●	●	●
		ZCMT200608	22.8	6.35	6.5	20.3	0.8		●	●	●	●	●	●

● Cartridge

Description	Spare Parts: Clamp Screw	Wrench
For Outer Edge (DR20CR-OUT) / For Inner Edge (DR20CR-IN)	HH6×12	LW-5
For Outer Edge (DR12CR-OUT) / For Inner Edge (DR12CR-IN)	HH4×12	LW-3

◆ Drill Diameter and Coolant



● : Std. Stock ○ : Check Availability △ : Made to order

Set-Up to Lathe Machine

■ Installation to the Lathe Machine

① The top face of the outer insert should be parallel to the X-axis to allow for offset cutting.
② It is recommended to set the outer insert as shown in Fig.1 with the outer insert facing the operator.
(It is also possible to use it by setting 180° reverse position.)
In case of the turning lathe with two turrets, when installing the drill to the lower turret, the outer insert should be set so as to face the operator.
(It is also possible to use it by setting at 180° reverse position)

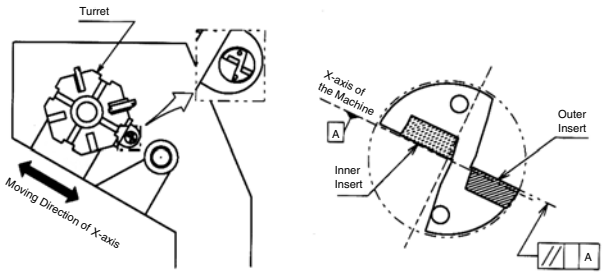


Fig.1 Installation to the Turning Lathe

■ Cutting Diameter Adjustment

1. Cutting Diameter Adjustment
① Cutting diameter is adjusted by moving the tool to the X-axis direction.
The moving direction of the X-axis depends on the position of the toolholder.
② In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
(This movement of the axis is called "Offset")
However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more.
Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
e.g.) in case of using ϕ20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset Limit of the Cutting Diameter
For the maximum limit of the cutting diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimension table.
(The figure in the table shows how much it is available to arrange the offset dimension in the radial direction.)
e.g.) in case of using ϕ20 drill, it is possible to make a hole up to ϕ21 since "Max. Offset (Radial)" is +0.5mm.

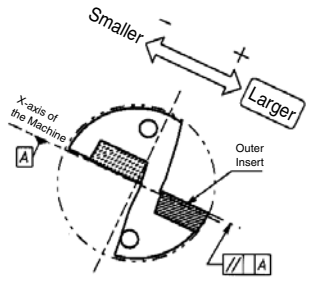


Fig. 2 Outer Insert Facing Up

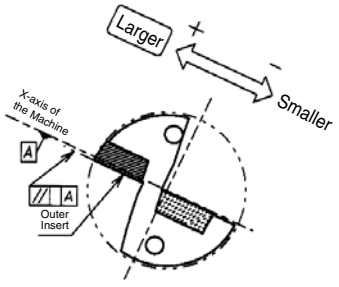


Fig. 3 Outer Insert Facing Down

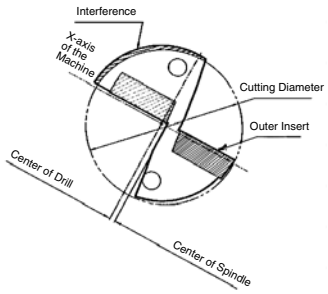


Fig. 4 Excessive Offset (For Smaller Hole Diameter)

■ Center Height Adjustment

1. Center Height of the Inner Insert
When installing inner insert as shown in Fig. 1, it will be set around 0.2mm below the Center of Spindle. (Fig. 5)
This is the normal position of the center height and the inner insert is designed to be set at in this condition.
However, in case that the turret of the lathe is out of the Center of Spindle, sometimes the inner insert may be set above, or excessively below the center.
For the stable machining, it is essential to check the Center Height of the inner insert carefully.

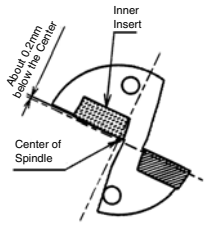


Fig. 5 Front View of the Drill

2. How to Check the Center Height of Inner Insert
For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal condition, the core of about 0.5mm in diameter will remain after the machining.

In the following case, it is necessary to adjust the Center Height.
· No Core remains
· Core Diameter is more than 1mm
For test cutting to check the Center Height, arrange the drilling about 10mm in depth at low feed rate of less than 0.1mm/rev.

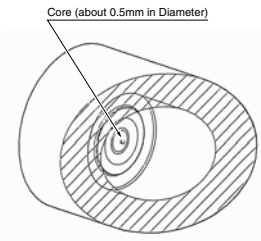


Fig. 6 Center Core

Set-Up to Lathe Machine

3. Center Height Adjustment

a) No Core or Core with very Small Diameter

It occurs when the Inner Insert is set above the Center Height.
In this case, adjustment is indispensable since the insert breakage will be easily caused near the center part of the drill. (Fig. 7)

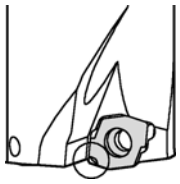


Fig. 7 Insert Breakage near the Center of Drill

[How to Adjust]

① Install the drill at the 180° reverse position. Problems would be mostly solved by this method.

② In case that the core diameter becomes too big after the above adjustment, install the drill rotating 90° counter-clockwise as shown in Fig.9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction.
(However, this makes it impossible to adjust the cutting diameter.)
Besides, in case of installing the toolholder in the opposite way (outer insert is positioned upper), the cutting diameter becomes smaller, which may cause the toolholder to interfere with the drilled hole.
The fundamental solution is to readjust the center position of the turret itself.

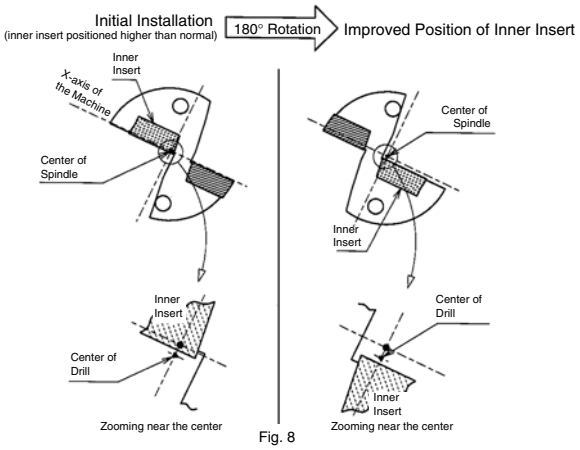


Fig. 8

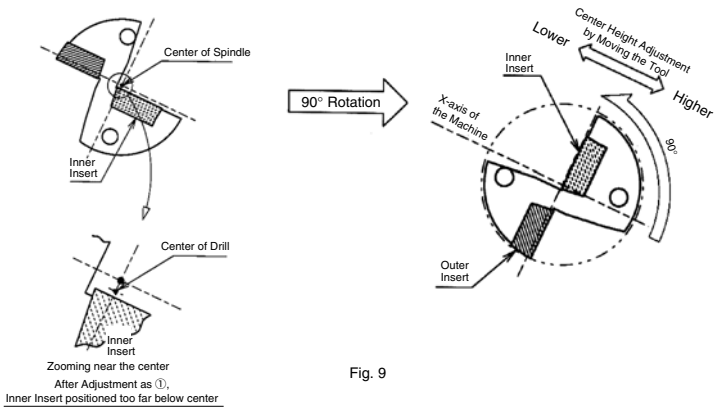


Fig. 9

b) Core with Excessively Large Diameter (More than 1mm)

It occurs when the inner insert is set excessively below the center.
This condition gives a bad influence to chip evacuation and the adjustment is required.

[How to Adjust]

Install the drill rotating 90° counter-clockwise as shown in Fig.10 (outer insert is positioned upper), and adjust the center height by moving the tool in the X-axis direction.
(However, this makes it impossible to adjust the cutting diameter.)
Besides, in case of installing the toolholder in the opposite way (outer insert is positioned lower), the cutting diameter becomes smaller, which may cause the toolholder to interfere with the drilled hole.
The fundamental solution is to readjust the center position of the turret itself.

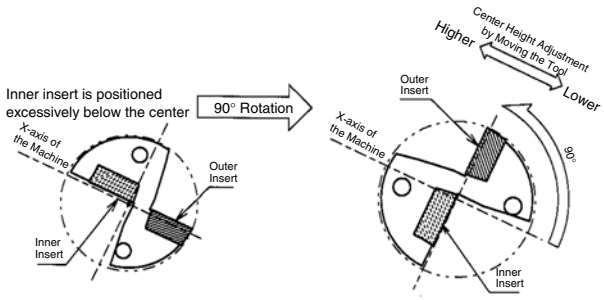


Fig. 10

Recommended Cutting Conditions

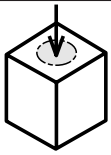
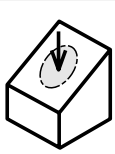
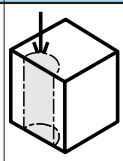
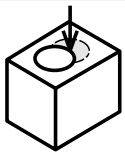
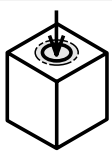
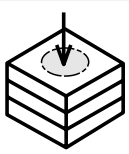
◆ Recommended Cutting Conditions (Wet) : DRZ type

Work Material	Recommended Grade (V_C: m/min) PVD Coated PR510 Standard	PR660 Standard SU SP	PR730 Standard SU	PR915 Standard	PR930 Standard SP	Carbide KW10 Standard SP	Cutting Dia. ϕD (mm)	Type (Cutting Depth) 2D f (mm/rev.)	3D	4D	5D
Low Carbon Steel (SS400,S15C etc.)	–	★ 120~220	☆ 120~240	☆ 120~240	☆ 120~220	–	ϕ13~ϕ15	0.06~0.10	0.06~0.10	0.04~0.08	–
							ϕ16~ϕ26	0.08~0.15	0.08~0.15	0.06~0.12	–
							ϕ27~ϕ50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
							ϕ50~	0.08~0.18	0.08~0.15	0.08~0.12	0.05~0.09
Carbon Steel (S45C etc.)	–	★ 100~160	☆ 120~180	☆ 120~180	☆ 100~160	–	ϕ13~ϕ15	0.06~0.10	0.06~0.10	0.04~0.08	–
							ϕ16~ϕ26	0.08~0.15	0.08~0.15	0.06~0.12	–
							ϕ27~ϕ50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
							ϕ50~	0.08~0.18	0.08~0.15	0.08~0.12	0.05~0.09
Alloy Steel (SCM,SCr etc.)	–	★ 80~140	☆ 100~160	☆ 100~160	☆ 80~140	–	ϕ13~ϕ15	0.06~0.10	0.06~0.10	0.04~0.08	–
							ϕ16~ϕ26	0.08~0.15	0.08~0.15	0.06~0.12	–
							ϕ27~ϕ50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
							ϕ50~	0.08~0.18	0.08~0.15	0.08~0.12	0.05~0.09
Die Steel (SKD,NAK etc.)	–	☆ 70~130	☆ 80~150	★ 80~150	☆ 70~130	–	ϕ13~ϕ15	0.04~0.08	0.04~0.08	0.03~0.07	–
							ϕ16~ϕ26	0.08~0.12	0.06~0.10	0.06~0.08	–
							ϕ27~ϕ50	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
							ϕ50~	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
Stainless Steel (Austenitic)	–	★ 60~120	☆ 70~140	☆ 70~140	☆ 60~120	–	ϕ13~ϕ15	0.04~0.08	0.04~0.08	0.03~0.06	–
							ϕ16~ϕ26	0.06~0.10	0.06~0.10	0.04~0.08	–
							ϕ27~ϕ50	0.06~0.12	0.06~0.12	0.04~0.10	0.04~0.07
							ϕ50~	0.06~0.12	0.06~0.12	0.04~0.10	0.04~0.07
Gray Cast Iron (FC)	★ 100~150	–	–	–	–	☆ 100~120	ϕ13~ϕ15	0.08~0.12	0.08~0.10	0.06~0.08	–
							ϕ16~ϕ26	0.10~0.18	0.10~0.15	0.08~0.12	–
							ϕ27~ϕ50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
							ϕ50~	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
Ductile Cast iron (FCD)	★ 80~120	–	–	–	–	☆ 80~100	ϕ13~ϕ15	0.08~0.12	0.08~0.10	0.06~0.08	–
							ϕ16~ϕ26	0.10~0.18	0.10~0.15	0.08~0.12	–
							ϕ27~ϕ50	0.10~0.20	0.10~0.18	0.08~0.15	0.05~0.10
							ϕ50~	0.10~0.20	0.10~0.18	0.08~0.15	0.05~0.10
Non-Ferrous Matal (Aluminium, Brass)	–	–	–	–	–	★ 200~600	ϕ13~ϕ15	0.06~0.12	0.06~0.10	0.04~0.08	–
							ϕ16~ϕ26	0.08~0.18	0.08~0.15	0.06~0.12	–
							ϕ27~ϕ50	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
							ϕ50~	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
Titanium Alloy	–	–	–	–	–	★ 40~70	ϕ13~ϕ15	0.05~0.06	0.05~0.06	0.05~0.06	–
							ϕ16~ϕ26	0.05~0.07	0.05~0.07	0.05~0.07	–
							ϕ27~ϕ50	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05
							ϕ50~	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05

· Apply sufficient amount of coolant

★ : 1st Recommendation ☆ : 2st Recommendation

◆ Cutting Conditions by Application (Work Material : S50C)

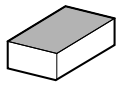
Application		Plain Surface	Slant Surface	Half Cylindrical	Hole Expansion	Concave Surface	Pre-drilled Surface	Pre-drilled Surface
Workpiece Shape								
DRS	V_C (m/min)	80	80	Not Recommended	Not Recommended	80	Not Available	Not Available
DRS	f (mm/rev)	0.08	0.04	Not Recommended	Not Recommended	Concave Part 0.04 / Continuous Part 0.08	Not Available	Not Available
DRZ	V_C (m/min)	120	120	120	120	120	Not Available	Not Available
DRZ	f (mm/rev)	0.1	0.05	0.05	0.05	Concave Part 0.05 / Continuous Part 0.1	Not Available	Not Available
Coolant		Yes	Yes	Yes	Yes	Yes	–	–

Face Milling

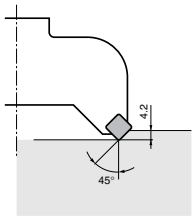
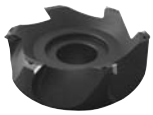
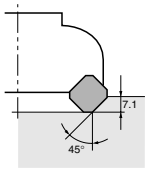
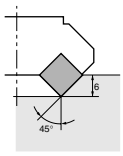
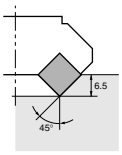
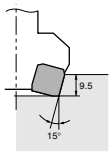
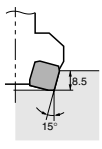
331～366

Product Lineup

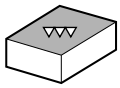
Facing



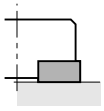
■ Face Milling Cutter / Milling Cutter with Shank

Application	Type	Corner Angle Max D.O.C.	Shape	Description	No. of Insert	Cutting Edge Dia. (mm)	Cutter Body Dia. (mm)	Features
Facing	**MSO45-09** 【MSO-Jr.】 P.342			**MSO 45100R-09** **45125R-09** **45160R-09**	5 6 8	100 125 160	110 135 170	● **Cutting Dia.: ϕ50～ϕ160** ● **A.R.: +27° R.R.: -8°** ● **Low Cutting Force**
				**MSO 4550-S32-09** **4563-S32-09** **4580-S32-09**	3 4 4	50 63 80	60 73 90	● **Great Cost Reduction by Screw Clamping & 09-type Small Insert** ● **Smaller Insert type of MSO45 Series**
	MSO45 【Hurricane Mill】 P.344			**MSO 45100R** **45125R** **45160R** **45200R**	5 6 8 10	100 125 160 200	115 140 175 215	● **Cutting Dia.: ϕ50～ϕ200** ● **A.R.: +27° R.R.: -8°** ● **Low Cutting Force** ● **High Efficiency Milling of Stainless Steel** ● **Stronger Edge with Insert Thickness 3.97mm**
				MSO 4550R-13E-4T **4563R-13E-5T** **4580R-13E-5T**	4 5 5	50 63 80	66 79 96	
				MSO 45100R-E **45125R-E** **45160R-E** **45200R-E**	5 6 8 10	100 125 160 200	115 140 175 215	
				**MSO 4550-S** **4563-S** **4580-S**	4 5 5	50 63 80	66 79 96	
	MSE45 P.346			**MSE 45100R** **45125R** **45160R**	5 6 8	100 125 160	126 151 186	● **Cutting Dia.: ϕ50～ϕ160** ● **A.R.: +20° R.R.: -3°** ● **High Rake type** ● **Low Cutting Force at Steel/Cast Iron Milling** ● **For Small Machine and M/C** ● **For Thin Work (Anti-chattering)**
				**MSE 4550** **4563** **4580-32**	3 4 4	50 63 80	73 86 103	
	MSD45 P.348			**MSD 4580R** **45100R** **45125R** **45160R** **45200R**	4 5 6 8 10	80 100 125 160 200	106 126 151 186 226	● **Cutting Dia.: ϕ50～ϕ200** ● **A.R.: +15～+16° R.R.: -3°** ● **High Rake type** ● **Low Cutting Force at Steel/Cast Iron Milling** ● **For Small Machine and M/C** ● **For Thin Work (Anti-chattering)**
				**MSD 4550** **4563** **4580-32**	3 3 4	50 63 80	73 87 104	
	MSP15 P.350			**MSP 1580R** **15100R** **15125R**	4 5 6	80 100 125	89 109 134	● **Cutting Dia.: ϕ50～ϕ125** ● **A.R.: +8～+10° R.R.: -2～0°** ● **For General Purpose** ● **Middle to Roughing of Steel / Cast Iron**
				**MSP 1550** **1563**	3 3	50 63	57 70	
	MSE15 P.352			**MSE 1550** **1563** **1580-32**	3 3 4	50 63 80	57 71 87	● **Cutting Dia.: ϕ50～ϕ80** ● **A.R.: +20° R.R.: +3～+6°** ● **High Rake type** ● **For Thin Work Milling of Steel/Cast Iron, Anti-Vibration at Small Machine and M/C**

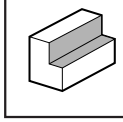
Super Finishing

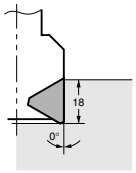
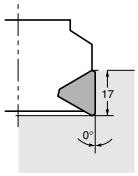
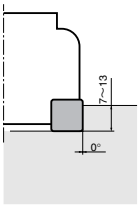


■ Face Milling Cutter / Milling Cutter with Shank

Application	Type	Corner Angle Max D.O.C.	Shape	Description	No. of Insert	Cutting Edge Dia. (mm)	Cutter Body Dia. (mm)	Features
Super Finishing	**EB** P.364			**EB -100R16** **-125R16** **-160R16** **-200R16** **-250R16**	1 1 1 1 1	100 125 160 200 250	100 125 170 205 255	● **Cutting Dia.: ϕ100～ϕ250** ● **A.R.: -6° R.R.: +0°** ● **Super Finishing of 2 to 6 μm Rz & Super High-Speed Finishing of Cast Iron**

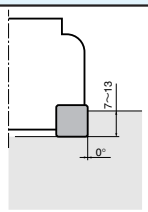
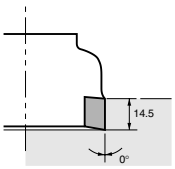
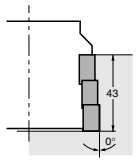
Shouldering



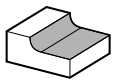
Application	Type	Corner Angle Max D.O.C.	Shape	Description	No. of Insert	Cutting Edge Dia. (mm)	Cutter Body Dia. (mm)	Features
Shouldering	**MTP90** P.353			**MTP 9050** **9063**	3 3	50 63	50 63	● **Cutting Dia.: ϕ50～ϕ60** ● **A.R.: +8° R.R.:+0°** ● **For General Purpose** ● **Middle to Roughing of Steel / Cast Iron** ● **For Small Machine and M/C**
	MTE90 P.354			**MTE 9080R** **90100R** **90125R** **90160R**	4 5 6 8	80 100 125 160	80 100 125 160	● **Cutting Dia.: ϕ50～ϕ160** ● **A.R.: +13～+16° R.R.: +3～+6°** ● **High Rake type** ● **Low Cutting Force** ● **For Shouldering of Cast Iron, Aluminum, Non-ferrous Metal**
				**MTE 9050** **9063** **9080-32**	3 3 4	50 63 80	50 63 80	
	MSO90 【Square Mill】 P.356			**MSO 90080R-09** **90100R-09** **90125R-09**	4 5 6	80 100 125	80 100 125	● **Cutting Dia.: ϕ50～ϕ200** ● **A.R.: +12～+15° R.R.: -10～-7°** ● **Low Cutting Force** ● **Economical by Screw Clamping & 4-Corner Use Insert** ● **Good Chip Evacuation**
				MSO 90080R-15 **90100R-15** **90125R-15** **90160R-15** **90200R-15**	4 5 6 8 10	80 100 125 160 200	80 100 125 160 200	
				MSO 9050R-09E-3T **9050R-09E-4T** **9050R-09E-5T** **9063R-09E-4T** **9063R-09E-6T** **9080R-09E-4T** **9080R-09E-8T** **90100R-09E-5T** **90100R-09E-7T** **90100R-09E-10T** **90125R-09E-6T** **90125R-09E-8T** **90125R-09E-12T** **90160R-09E-8T** **90160R-09E-12T** **90160R-09E-15T**	3 4 5 4 6 4 8 5 7 10 6 8 12 8 12 15	50 50 50 63 63 80 80 100 100 100 125 125 125 160 160 160	50 50 50 63 63 80 80 100 100 100 125 125 125 160 160 160	
				MSO 9050R-15E-3T **9050R-15E-4T** **9063R-15E-4T** **9063R-15E-5T** **9080R-15E-4T** **9080R-15E-6T** **90100R-15E-5T** **90100R-15E-6T** **90125R-15E-6T** **90160R-15E-8T**	3 4 4 5 4 6 5 6 6 8	50 50 63 63 80 80 100 100 125 160	50 50 63 63 80 80 100 100 125 160	

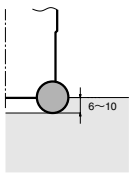
Product Lineup

Shouldering

Application	Type	Corner Angle Max ap	Shape	Description	No. of Insert	Cutting Edge Dia. (mm)	Cutter Body Dia. (mm)	Features
Shouldering	**MSO90** 【Square Mill】 P.356			**MSO 9050-S32-09**	3	50	50	● Cutting Dia.: ϕ50～ϕ80 ● A.R.: +12～+15° R.R.: -10～-7° ● Low Cutting Force ● Economical by Screw Clamping & 4-Corner Use Insert ● Good Chip Evacuation
				9063-S32-09	4	63	63	
				9080-S32-09	4	80	80	
				MSO 9050-S32-15	3	50	50	
				9063-S32-15	4	63	63	
				9080-S32-15	4	80	80	
	MFB 【Hurricane Mill】 P.358			**MFB 63R**	6	63	63	● Cutting Dia.: ϕ63～ϕ160 ● A.R.: +11° R.R.: -5～-2° ● Face Mill type of MEB Endmill ● High Rigidity with Integral Arbor Design
				80R	7	80	80	
				100R	8	100	100	
				125R	9	125	125	
				160R	10	160	160	
				MFB 50R-E-5T	5	50	50	
				63R-E-6T	6	63	63	
				80R-E-8T	8	80	80	
				100R-E-10T	10	100	100	
				125R-E-12T	12	125	125	
				160R-E-15T	15	160	160	
	MSM 【Hurricane Mill】 P.359			**MSM 63**	16	63	63	● Cutting Dia.: ϕ63～ϕ100 ● A.R.: +9° R.R.: +0° ● Shell Mill type of MEA/MEB Endmill ● High Rigidity with Integral Arbor Design ● Long Cutting Edge
				80	16	80	80	
				100	24	100	100	
				MSM 63-E	16	63	63	
				80-E	16	80	80	
				100-E	24	100	100	

Curved Facing



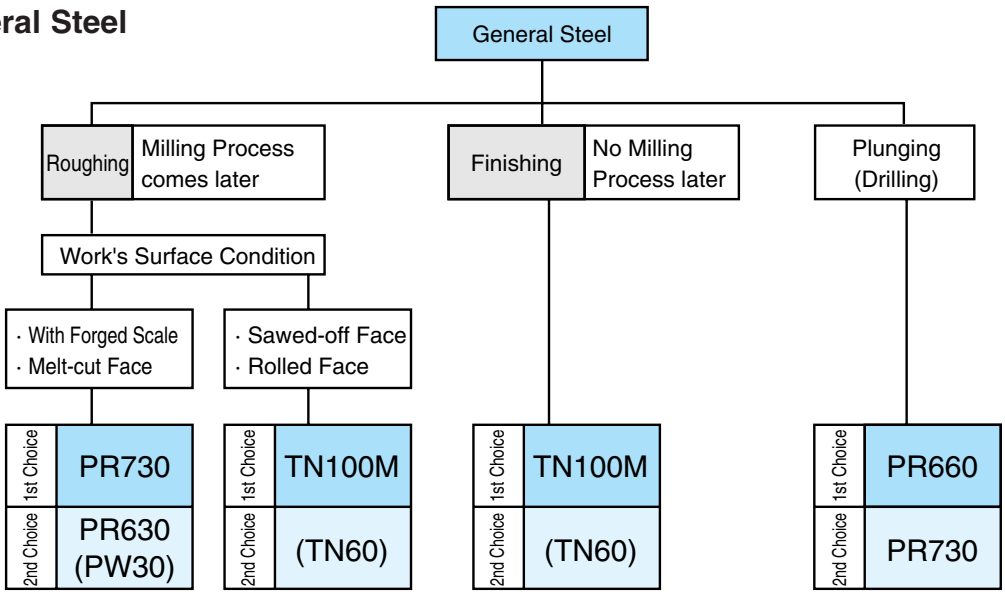
Application	Type	Corner Angle Max ap	Shape	Description	No. of Insert	Cutting Edge Dia. (mm)	Cutter Body Dia. (mm)	Features
Curved Facing	**MRP** 【Radius Mill】 P.361			**MRP 050R-10-6T**	6	40	50	● Cutting Dia.: ϕ12～ϕ125 ● A.R.: +5° R.R.: -5°～-3° ● For Metal Mold Machining ● Available to various types of Machining (Contouring, Helical Milling, Ramping, etc.) ● Firm Insert Fix by New Ratchet Design ● Wide Product Lineup of Small Dia. type, Multi Edge type, etc.
				063R-10-7T	7	53	63	
				MRP 050R-12	4	38	50	
				063R-12	5	51	63	
				080R-12	6	68	80	
				080R-12-7T	7	68	80	
				MRP 080R-16	5	54	80	
				100R-16	6	84	100	
				100R-16-7T	7	84	100	
				125R-16	6	109	125	
				125R-16-8T	8	109	125	
				MRP 080R-20	4	60	80	
				100R-20	5	80	100	
				MRP 052R-10E-6T	6	42	52	
				066R-10E-7T	7	56	66	
				MRP 080R-12E-7T	7	68	80	
				MRP 100R-16E-7T	7	84	100	
				125R-16E-8T	8	109	125	

MRP-S Endmill
(Cutting Dia. ϕ12～ϕ63) P.422

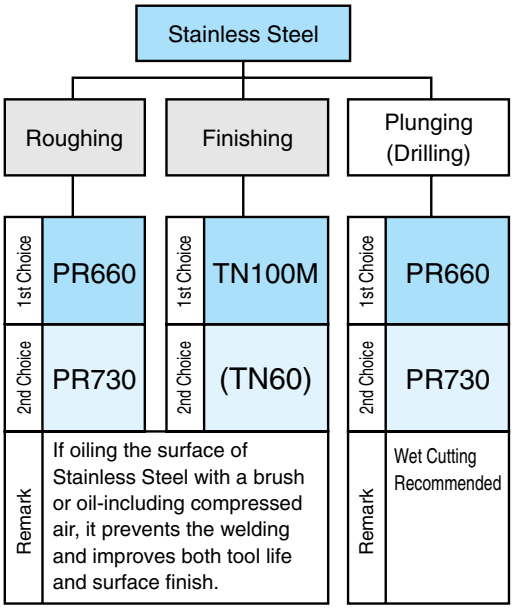
●: Std. Stock ○: Check Availability

Insert Grade Selection

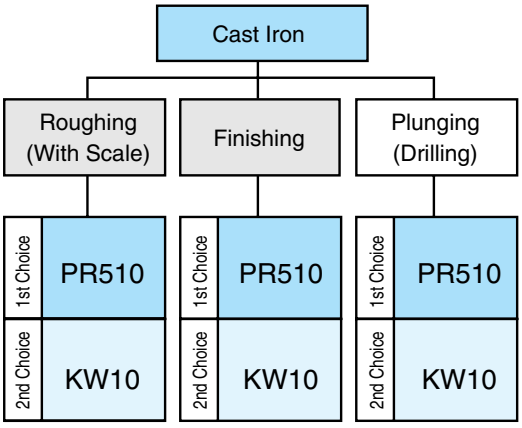
● General Steel



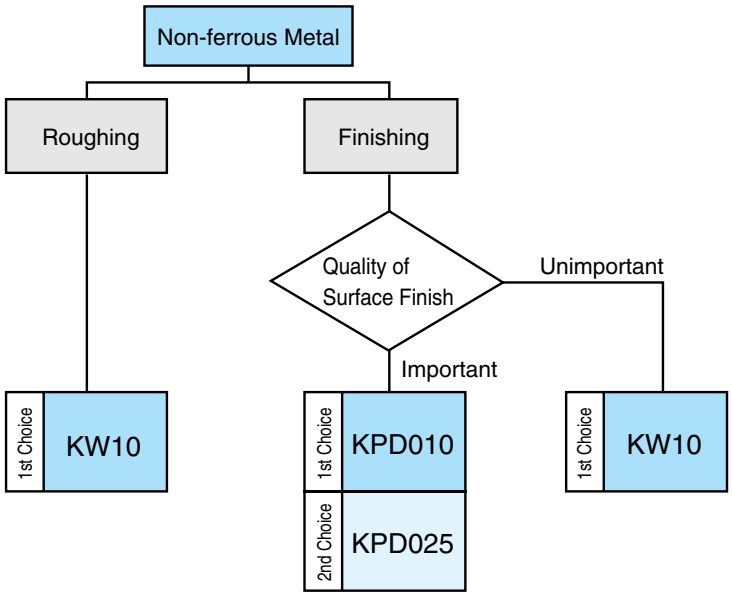
● Stainless Steel



● Cast Iron



● Non-ferrous Metal



Milling Inserts Identification System

Symbol	Shape
A	85° Parallelogram
B	82° Parallelogram
C	80° Rhombic
H	Hexagon
L	Rectangle
M	87° Rhombic
N	86° Rhombic
O	Octagon
P	Pentagon
R	Round
S	Square
T	Triangle

①Shape

Symbol	Relief Angle(°)
N	0
A	3
B	6
C	7
P	11
D	15
E	20
F	25
G	30
H	0-11
J	0-14
K	0-17
L	0-20
M	11-14
R	11-17
S	11-20

②Relief Angle

(mm)

Symbol	Corner-R	Thickness	IC Size
A	±0.005	±0.025	±0.025
J	±0.005	±0.025	※±0.05~±0.13
C	±0.013	±0.025	±0.025
H	±0.013	±0.025	±0.013
E	±0.025	±0.025	±0.025
G	±0.025	±0.13	±0.025
K	±0.013	±0.025	※±0.05~±0.13
M	※±0.08~±0.18	±0.13	※±0.05~±0.13
U	※±0.13~±0.38	±0.13	※±0.08~±0.25

※Tolerance differs depending on Insert size.

③Tolerance

Symbol	Shape
F	2-side Chipbreakers, Without Hole
N	No Chipbreaker, Without Hole
R	1-side Chipbreaker, Without Hole
M	1-side Chipbreaker, With Hole
A	No Chipbreaker, With Hole

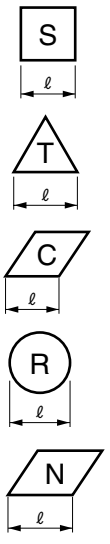
④Type

Symbol	Shape
F	Sharp Edge
E	R-honed
T	Chamfer
S	Chamfer + R-honed

⑨Edge Preparation

S	E	K	N	12	03	A	F	T	N
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

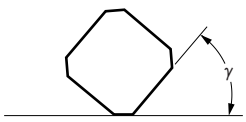
⑤Edge Length



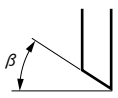
⑥Thickness	
Symbol	T
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

⑦⑧Cutting Edge Angle / Relief Angle / Corner-R

⑦Cutting Edge Angle	
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
X	65°



⑧Relief Angle	
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
R	10°
S	14°
T	22°
U	23°



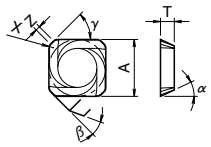
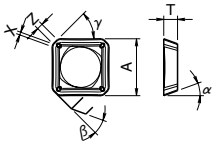
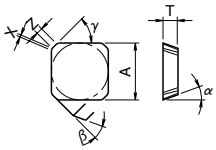
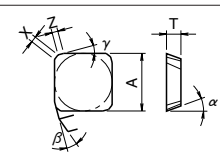
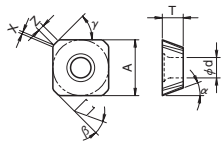
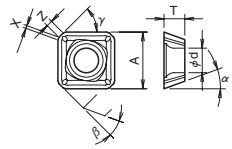
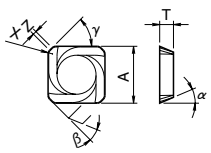
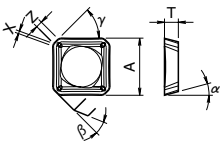
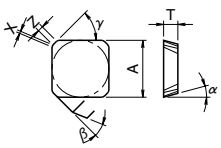
⑦⑧Corner-R	
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0

⑩Tool Hand

Symbol	Hand
R	Right
L	Left
N	Without Hand

Milling Indexable Inserts

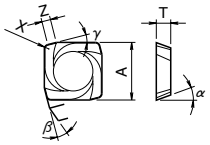
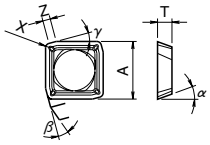
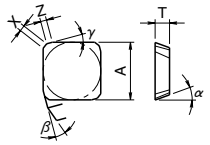
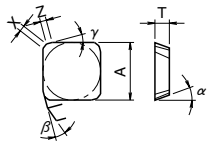
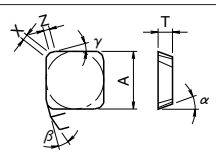
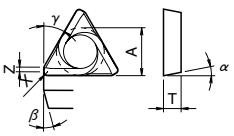
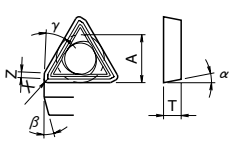
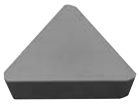
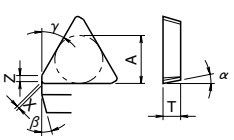
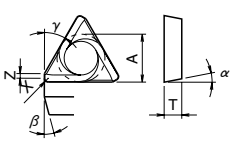
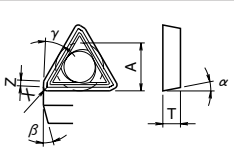
Milling Inserts

Shape (Handed Insert shows Right-hand)		Description	Dimension (mm) A	T	φd	X	Z	Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Ref. Page for Milling Cutter
		**SEMR 1203AFER-H**	12.70	3.18	-	R1.0	1.0	20°	25°	45°					○		●			●	346
		SEMR 1204AFER-H	12.70	4.76	-	R1.0	1.0	20°	25°	45°					○		●				-
		**SEKR 1203AFEN-S**	12.70	3.18	-	0.5	1.7	20°	25°	45°		●		○		●	●				346
		SEKR 1203AGEN-S	12.70	3.18	-	0.5	1.7	20°	30°	45°						●					-
		**SEEN 1203AFTN**	12.70	3.18	-	0.5	1.4	20°	30°	45°	○	○								○	
		SEKN 1203AFTN 1203AFFN	12.70	3.18	-	0.5	1.4	20°	25°	45°	●	●	○	● ●	○	●	●		●		346
		SEKN 1204AFTN	12.70	4.76	-	0.5	1.4	20°	25°	45°		●									-
		SEKN 1504AFTN	15.875	4.76	-	0.5	1.4	20°	25°	45°		●		●			●			●	-
		SEKN 1203AGTN	12.70	3.18	-	0.5	1.4	20°	30°	45°						●					-
		**SEKN 1203EFTR**	12.70	3.18	-	1.2	1.4	20°	25°	15°		●	○		●		○				352
		SEEN 1504EFTR	15.875	4.76	-	1.2	1.4					●									352
		**SEKW 1204AFTN**	12.70	4.76	5.5	0.5	1.7	20°	25°	45°		●		●		●	●				-
		**SEKT 1204AFEN-S**	12.70	4.76	5.5	0.5	1.7	20°	25°	45°		●				●	●				-
		**SDMR 1203AUER-H**	12.70	3.18	-	R1.0	0.8	15°	23°	45°					○		○				348
		**SDKR 1203AUEN-S**	12.70	3.18	-	0.5	1.7	15°	23°	45°		●		○		●	○				348
		**SDCN 1203AUTN**	12.70	3.18	-	0.5	1.2	15°	23°	45°		○	○								348
		SDCN 1504AUTN	15.875	4.76	-	0.5	1.2	15°	23°	45°			○								-
		SDKN 1203AUTN 1203AUFN	12.70	3.18	-	0.5	1.2	15°	23°	45°	○	●	○	○	○	○	○		●	○	348
		SDKN 1504AUTN	15.875	4.76	-	0.5	1.2	15°	23°	45°	○	○	○		○		○			○	-

●: Std. Stock ○: Check Availability

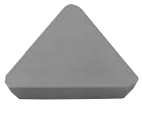
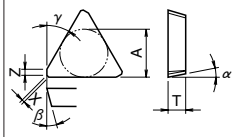
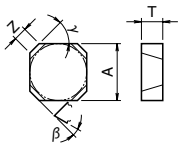
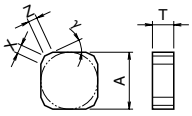
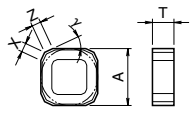
Milling Indexable Inserts

Milling Inserts

Shape (Handed Insert shows Right-hand)		Description	Dimension (mm) A	T	φd	X	Z	Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Ref. Page for Milling Cutter
		**SPMR 1203EDER-H**	12.70	3.18	-	R1.0	2.0	11°	15°	15°					○		●				350
		**SPKR 1203EDER-S**	12.70	3.18	-	R1.0	2.0	11°	15°	15°		●		○		●	●				350
		**SPCN 1203EDTR**	12.70	3.18	-	R1.0	2.0	11°	15°	15°		○	○								
		SPKN 1203EDTR	12.70	3.18	-	R1.0 1.0	2.0	11°	15°	15°	○	●	○	●	○	○	●			●	350
		1203EDTL	12.70	3.18	-	R1.0	2.0	11°	15°	15°		○					●				-
		SPKN 1203EDFR	12.70	3.18	-	1.0	1.6	11°	15°	15°									●		350
		SPKN 1504EDTR 1504EDTL	15.875	4.76	-	1.0	2.2	11°	15°	15°	○	●	○ ○	○	○		●			○	-
		SPKN 1504EDFR	15.875	4.76	-	1.0	2.2	11°	15°	15°									●		
		**SPCN 1203XPTR**	12.70	3.18	-	R1.0	2.0	11°	11°	25°		○	○								
		SPKN 1203XPTR	12.70	3.18	-	R1.0 1.0	2.0	11°	11°	25°	○	○	○	○	○		○			○	-
		1203XPTL	12.70	3.18	-	R1.0	2.0	11°	11°	25°		○									
		SPKN 1203XPFR	12.70	3.18	-	1.0	2.0	11°	11°	25°									○		
		SPKN 1203XDTR	12.70	3.18	-	R1.0	2.0	11°	15°	25°			○								-
		SPKN 1504XETR	15.875	4.76	-	1.0	2.0	11°	20°	25°	○	○	○		○					○	-
		**SPCN 1904EETR1**	19.05	4.76	-	0.7	1.2	11°	20°	15°		○	○								-
		**TPMR 1603PDER-H**	9.525	3.18	-	R0.8	1.2	11°	15°	30°					○		●			●	-
		TPMR 2204PDER-H	12.70	4.76	-	R1.0	1.4	11°	15°	30°					○		●			●	353
		**TPKR 2204PDER-S**	12.70	4.76	-	R1.0	1.4	11°	15°	30°		○		○		●	○				353
		**TPKN 1603PDTR 1603PDFR**	9.525	3.18	-	0.7	1.2	11°	15°	30°	○	●	○	●	○		●		○	○	-
		TPKN 2204PDTR 2204PDFR	12.70	4.76	-	0.7	1.6	11°	15°	30°	○	●	○	●	○	○	●		○	○	353
		**TEMR 1603PTER-H**	9.525	3.18	-	R0.8	1.2	20°	15°	30°					○		●				389
		TEMR 2204PTER-H	12.70	4.76	-	R1.0	1.4	20°	15°	30°					○		●				354
		**TEKR 2204PTER-S**	12.70	4.76	-	R1.0	1.4	20°	22°	30°		○		○		●	●				354

●: Std. Stock ○: Check Availability

Milling Inserts

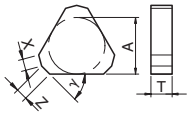
Shape (Handed Insert shows Right-hand)	Description	Dimension (mm) A	T	φd	X	Z	Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Ref. Page for Milling Cutter
 	**TEEN 1603PTFR**	9.525	3.18	-	0.6	1.4	20°	22°	30°									●		
	TEKN 1603PTTR	9.525	3.18	-	R0.8 0.7	1.0 1.4	20°	22°	30°	○	●	○	●	○		○			○	389
	1603PTFR	9.525	3.18	-	0.7	1.4	20°	22°	30°									●		
	TEEN 2204PTTR	12.70	4.76	-	R1.0	1.4	20°	22°	30°	○	○	○								○	
	TEKN 2204PTTR	12.70	4.76	-	R1.0 0.7	1.4	20°	22°	30°	○	●	○	●	○	○	○				○	354
	2204PTFR	12.70	4.76	-	0.7	1.4	20°	22°	30°									●		
 	**SNCN 1904ADTN1**	19.05	4.76	-	-	2.2	-	15°	45°			○									-
 	**SNCN 1204XNTN** **SNKN 1204XNTN**	12.70	4.76	-	2.0	2.0	-	-	25°		○ ○	○ ○									-
 	**SNMF 1204XNTN**	12.70	4.76	-	2.0	2.0	-	-	25°		○	○									-

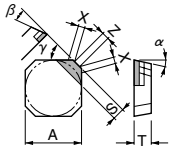
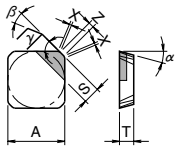
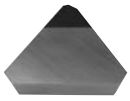
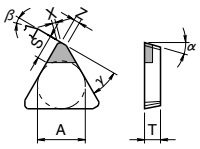
Cutting Range	Chipbreaker		Feature
Finishing - Roughing	**S**		Hurricane Super chipbreaker for general use cutter. Low cutting force due to 13° chipbeaker rake angle. Available to various a*p* with 3-step chipbreaker design. Ground wiper edge realizes the good surface roughness.
Medium - Roughing	**H**		Hurricane chipbreaker for general use cutter. Fluent chip evacuation due to the chipbreaker's smooth rake face. 20% less cutting force than no-chipbreaker type due to 25° rake angled chipbreaker.

Milling Indexable Inserts [Ceramic / CBN · Diamond]

Milling Inserts

Edge Preparation	
KS500 / KS6000	0.20mm × 15°

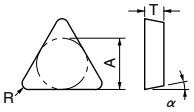
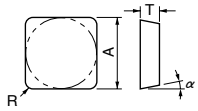
Shape		Description	Dimension (mm)					Angle (°)			Insert Grade						Ref. Page for Toolholder
											Alumina Ceramic			Silicon Nitride Ceramic		PVD Ceramic	
			A	T	ϕd	X	Z	α	β	γ	KA30		A65	KS500	KS6000	A66N	
		**TNCN 1204ANT**	12.07	4.76	–	2.6	2.6	–	–	45°				●	●		–

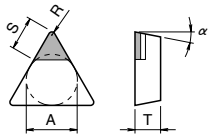
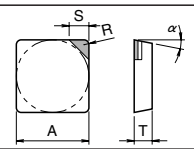
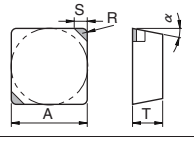
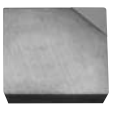
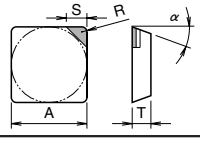
Shape Handed Insert shows Right-hand		Description	Dimension (mm)					Angle (°)			Insert Grade										Ref. Page for Milling Cutter
											CBN					Diamond					
			A	T	X	Z	S	α	β	γ	KBN10B	KBN25B	KBN65B	KBN900		KPD025	KPD010	KPD002	KPD001		
		**SEEN 1203AFFN**	12.70	3.18	0.5	1.4	2.9	20°	25°	45°						○	●		○		346
		**SDKN 1203AUFN**	12.70	3.18	0.5	1.2	2.9	15°	23°	45°							○		○		348
		**TEEN 1603PTFR**	9.525	3.18	0.6	1.4	3.9	20°	22°	30°							○		○		389
		TEKN 2204PTFR	12.70	4.76	0.7	1.8	3.9	20°	22°	30°							○		○		354

●: Std. Stock ○: Check Availability

Milling Indexable Inserts

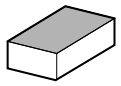
Milling Inserts (Available to Turning)

Shape	Description	Dimension (mm) A	T	R	Angle (°) α	Insert Grade: Cermet TN30	TN60	TN100M	TC30	TC60	PVD Cermet PV30	CVD Coated CR7015	CR7025	PVD Coated PR660	Carbide KW10	PW30	Ceramic A65	A66N	Ref. Page for Milling Cutter
 	TPMN 110304	6.35	3.18	0.4	11°							●			●				389
	TPMN 110308			0.8								●			●				
	TPMN 160304	9.525	3.18	0.4	11°			●		○	○	●			●				-
	TPMN 160308			0.8				●		●	○	●			●				
	TPMN 160312			1.2				●		●		●							
	TPMN 220408	12.70	4.76	0.8	11°			●		○									-
	TPMN 220412			1.2						●									
	TPGN 090202	5.56	2.38	0.2	11°	○	○								○				-
	TPGN 090204			0.4		○	○		○						○				
	TPGN 090208			0.8			○												
	TPGN 110302	6.35	3.18	0.2	11°	●			○						○			●	389
	TPGN 110304			0.4		○	●		○						○		●	●	
	TPGN 110308			0.8			●		○						○		●	●	
	TPGN 160302	9.525	3.18	0.2	11°												●		-
	TPGN 160304			0.4		○	●		○						●		●	●	
	TPGN 160308			0.8		○	●		○						○		●	●	
	TPGN 160312			1.2											○		○	●	
 	SPUN 090308	9.525	3.18	0.8	11°							●		●		●			-
	SPUN 120308	12.70	3.18	0.8	11°											●			-
	SPMN 090304	9.525	3.18	0.4	11°						○								-
	SPMN 090308			0.8															
	SPMN 120304	12.70	3.18	0.4	11°		○	○		●	○	○			●				-
	SPMN 120308			0.8			○	○		●		○	●		●				
	SPMN 120312			1.2			○	○		●		○							
	SPGN 090304	9.525	3.18	0.4	11°	●			○						○			●	-
	SPGN 090308			0.8					○						○		○	●	
	SPGN 120304	12.70	3.18	0.4	11°	●	●		○						○		●	●	-
	SPGN 120308			0.8					○						○		○	●	
	SPGN 120312			1.2													○	●	

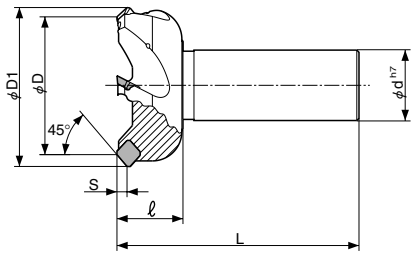
Shape	Description	Dimension (mm) A	T	R	S (CBN)	S (Diamond)	Angle (°) α	Insert Grade: CBN KBN10B	KBN25B	KBN65B	KBN900	Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Milling Cutter
 	TPGN 090202	5.56	2.38	0.2	-	3.9	11°					○	○			-
	TPGN 090204			0.4		3.7							○			
	TPGN 090208			0.8		3.4							○			
	TPGN 110302	6.35	3.18	0.2	-	3.9	11°					○	○		○	389
	TPGN 110304			0.4	3.8	3.7		○	○				○	○	○	
	TPGN 110308			0.8	3.5	3.4		○	○				○			
	TPGN 160302	9.525	3.18	0.2	-	3.9	11°					○	○		○	-
	TPGN 160304			0.4	3.9	3.7			○				○	○	○	
	TPGN 160308			0.8	3.6	3.4		○	○				○			
	TPGN 160312			1.2	3.3	-			●							
 	SPGN 090308	9.525	3.18	0.8	4.1	-	11°	○								-
	SPGN 120304	12.70	3.18	0.4	-	4.2	11°						○			-
 	SPGN 120304ME-T	12.70	3.18	0.4	1.8	-	11°		●							-
 	SEGN 120304	12.70	3.18	0.4	-	4.2	20°						○			-

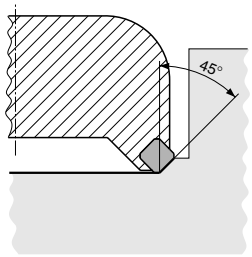
●: Std. Stock ○: Check Availability

Corner Angle 45° Type [SO□□09 Insert]

Facing	Chamfering
	

■ MSO45-S-09 (High Rake Type)





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts Clamp Screw	Wrench
MSO 4550-S32-09	○	3	50	60	32	110	30	4.2	+27°	-8°	SB-3060TR	DT-10
4563-S32-09	○	4	63	73	32	110	30	4.2				
4580-S32-09	○	4	80	90	32	110	30	4.2				

■ MSO45-09 (High Rake Type)

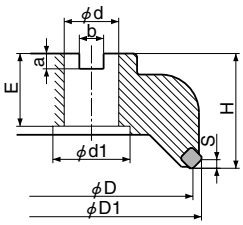


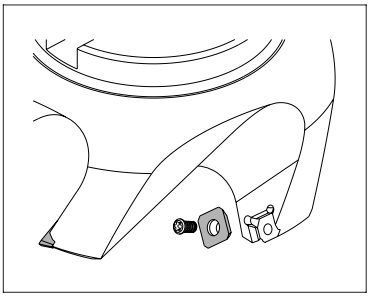
Fig.1

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	φd1	H	E	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSO 45100R-09	○	5	100	109.7	31.75	48	60	32	8	12.7	4.2	+27°	-8°	Fig.1	1.9
45125R-09	○	6	125	134.7	38.10	58	60	38	10	15.9	4.2				2.8
45160R-09	○	8	160	169.6	50.80	68	60	38	11	19.0	4.2				4.6

● Spare Parts

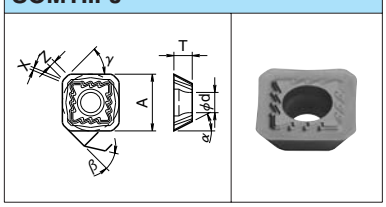
Description	Clamp Screw	Wrench
MSO 45100R-09 45125R-09 45160R-09	SB-3060TR	DT-10



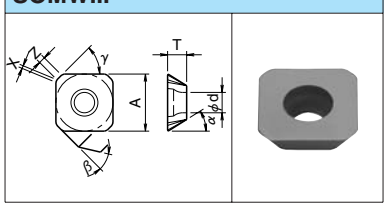
●: Std. Stock ○: Check Availability

● Applicable Insert

SOMT...-J



SOMW...



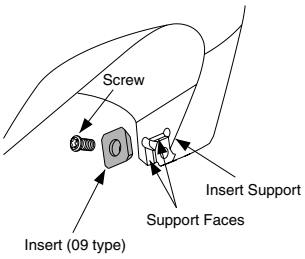
Description	Dimension (mm)					Angle (°)			Insert Grade												
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	φd	X	Z	α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
SOMT 0903AXEN-J	9.525	3.18	3.4	0.5	1.1	27°	32°	45°		○		○	○	○	○		○					
SOMW0903AXTN 0903AXFN	9.525	3.18	3.4	0.5	1.1	27°	32°	45°		●		○	●	○	●		○					

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200			☆ 120~200	★ 100~200	☆ 120~200							
Carbon Steel (SxxC)	~0.3		★ 120~200			☆ 120~200	☆ 100~180	★ 120~200							
Alloy Steel (SCM)	~0.3		★ 100~180			☆ 100~180	☆ 80~150	★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.25		★ 100~180			☆ 80~150	☆ 60~130	★ 80~150							
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

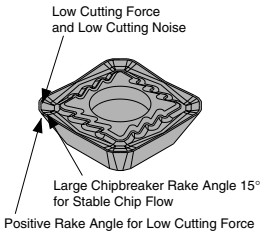
1. Great Cost Reduction with Screw Clamp system and 09 type Smaller Insert



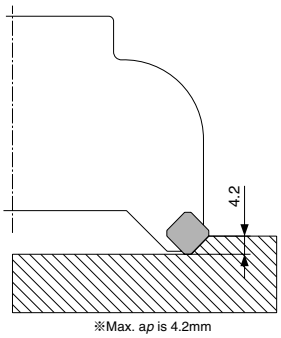
2. Marvelous Low Cutting Force with Super High Rake A.R. + 27° & Hurricane J-Chipbreaker

3. Easy Insert Positioning by New Concept "Insert Support"

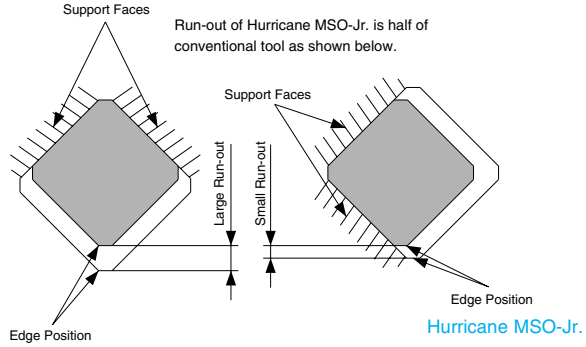
4. Insert's Index Accuracy Improvement by Redesign of Insert Support Faces



5. Most Suitable for Near-net-shape Work



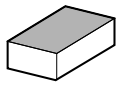
※Max. *ap* is 4.2mm



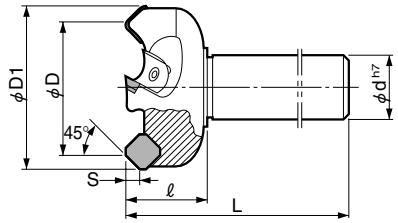
Conventional

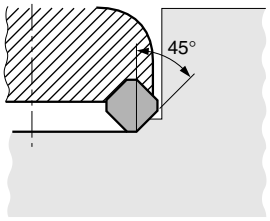
●: Std. Stock ○: Check Availability

Corner Angle 45° Type [SO□□13 Insert]

Facing	Chamfering
	

■ MSO45-S (High Rake type)





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts Shim	Clamp Screw	Clamp	Clamp Screw	Wrench
MSO 4550-S	○	4	50	66	32	120	40	7.1	+27°	-8°	MSO-4T245	SP3X6	CH-20R	TH8X15	TH-4
4563-S	○	5	63	79	32	120	40	7.1							
4580-S	●	5	80	96	32	120	40	7.1							

■ MSO45 (High Rake type)

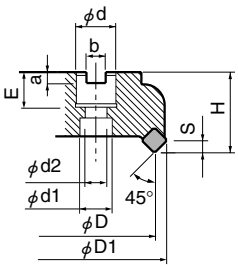


Fig.1

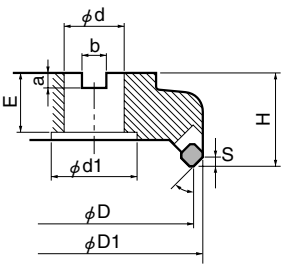


Fig.2

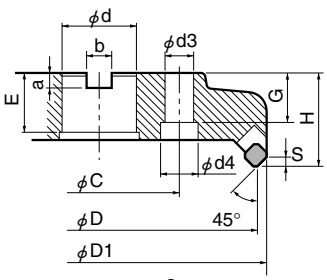


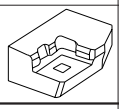
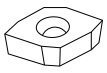
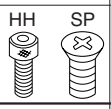
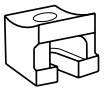
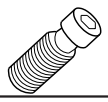
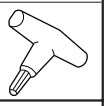
Fig.3

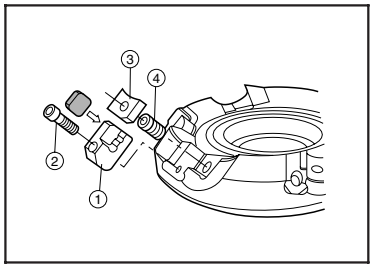
● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	φd1	φd2	φd3	φd4	φC	H	E	G	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSO 45100R	○	5	100	114.8	31.75	48	-	-	-	-	60	32	-	8	12.7	7.1	+27°	-8°	Fig.2	2.5
45125R	○	6	125	140.0	38.10	58	-	-	-	-	60	38	-	10	15.9	7.1				3.7
45160R	○	8	160	174.5	50.80	68	-	-	-	-	60	38	-	11	19.0	7.1				5.4
45200R	○	10	200	214.5	47.625	-	-	18	26	101.6	60	38	32	14	25.4	7.1			Fig.3	8.4
MSO 4550R-13E-4T	●	4	50	65.9	22	18	12	-	-	-	40	20	-	6.3	10.4	7.1	+27°	-8°	Fig.1	0.4
4563R-13E-5T	●	5	63	78.9	22	18	12	-	-	-	45	20	-	6.3	10.4	7.1				1.0
4580R-13E-5T	●	5	80	95.9	27	20	14	-	-	-	50	22	-	7.2	12.4	7.1				1.3
MSO 45100R-E	●	5	100	114.8	32	48	-	-	-	-	60	28	-	8	14.4	7.1	+27°	-8°	Fig.2	2.5
45125R-E	●	6	125	140.0	40	58	-	-	-	-	60	30	-	9	16.4	7.1				3.7
45160R-E	●	8	160	174.5	40	58	-	-	-	-	60	30	-	10	16.4	7.1				5.4
45200R-E	●	10	200	214.5	60	62	-	18	26	101.6	60	38	32	15	25.4	7.1			Fig.3	8.4

●: Std. Stock ○: Check Availability

● Spare Parts

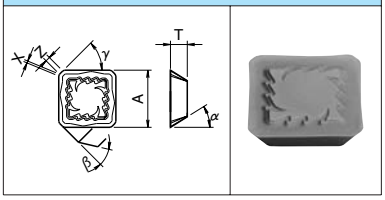
Description	①Cartridge	①Shim	②Clamp Screw	③Clamp	④Clamp Screw	Wrench
			 HH SP			
MSO 45100R 45125R 45160R 45200R	LSO-445R	-	HH4X16	CH-20R	TH8X15	TH-4
MSO 4550R-13E-4T 4563R-13E-5T 4580R-13E-5T	-	MSO-4T245	SP3X6	CH-20R	TH8X15	TH-4
MSO 45100R-E 45125R-E 45160R-E 45200R-E	LSO-445R	-	HH4X16	CH-20R	TH8X15	TH-4



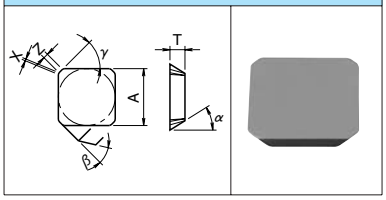
● Arbor Clamp Screw (HH10×25) is attached to MSO4550R-13E-4T & MSO4563R-13E-5T.
● Arbor Clamp Screw (HH12×30) is attached to MSO4580R-13E-5T.

● Applicable Insert

SOKR...-J



SOKN...



Description	Dimension (mm)					Angle (°)			Insert Grade											
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	X	Z		α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
SOKR13T3AXEN-J	13.494	3.97	0.5	1.1		27°	32°	45°		○		●	○	●	●		○					
SOKN13T3AXTN 13T3AXFN	13.494	3.97	0.5	1.1		27°	32°	45°		●	○	●	○	●	●		●					

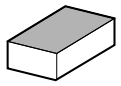
Cutting Range	Chipbreaker		Feature
Finishing - Roughing	J		Chipbreaker only for MSO Cutter. Cutting force's great reduction with 15° chipbreaker's rake angle and 27° positive angle. Back force remains low even increasing the feed rate. Larger & stronger type insert with thickness 3.97mm and IC 13.494mm, and suitable for hard-to-machine materials like stainless steel.

◆ Recommended Cutting Conditions

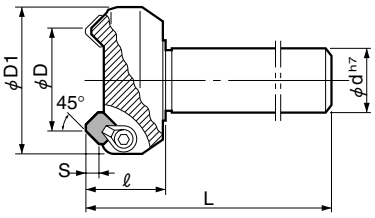
Work Material	f (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 120~200	★ 100~200	☆ 120~200							
Carbon Steel (SxxC)	~0.3		★ 120~200	☆ 120~200		☆ 120~200	☆ 100~180	★ 120~200							
Alloy Steel (SCM)	~0.3		★ 100~180	☆ 100~180		☆ 100~180	☆ 80~150	★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.25		★ 100~180	☆ 100~180		☆ 80~150	☆ 60~130	★ 80~150							
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

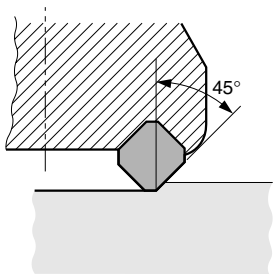
★: 1st Recommendation ☆: 2nd Recommendation

Corner Angle 45° Type [SE□□ Insert]

Facing	Chamfering
	

■ MSE45-S (High Rake type)





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts: Clamp Set	Wrench	Shim	Clamp Screw
MSE 4550	○	3	50	73	32	120	40	6	+20°	-3°	CPS-6M	LW-3	MSE-4245	SP3X8
4563	○	4	63	86	32	120	40	6						
4580-32	●	4	80	103	32	120	40	6						

■ MSE45 (High Rake type)

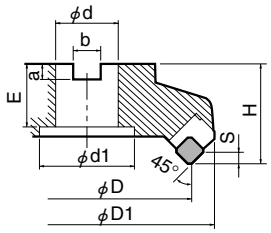


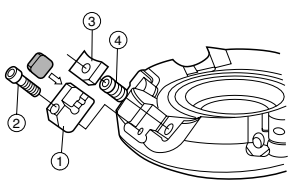
Fig.1

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	φd1	H	E	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSE 45100R	○	5	100	126	31.75	48	60	32	8	12.7	6	+20°	-3°	Fig.1	2.9
45125R	○	6	125	151	38.10	58	60	38	10	15.9	6				4.1
45160R	○	8	160	186	50.80	68	60	38	11	19.0	6				6.1

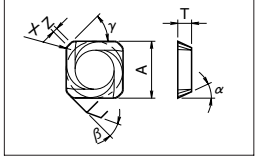
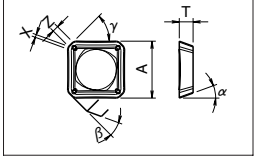
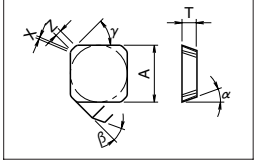
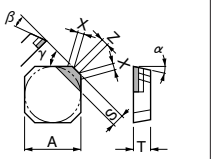
● Spare Parts

Description	①Cartridge	②Clamp Screw	③Clamp	④Clamp Screw	Wrench
MSE 45100R 45125R 45160R	LSE-445R	HH4X16	C20R	TH8X15	TH-4



●: Std. Stock ○: Check Availability

● Applicable Insert

SEMR...-H	SEKR...-S	SEK(E)N...AF(T/F)N	SEEN...AFFN
			

Diamond

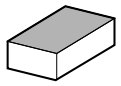
Description	Dimension (mm)					Angle (°)			Insert Grade											
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	X	Z	S	α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
SEMR1203AFER-H	12.70	3.18	R1.0	1.0	-	20°	25°	45°					○		●			●				
SEKR1203AFEN-S	12.70	3.18	0.5	1.7	-	20°	25°	45°		●		○		●	●							
SEKN1203AFTN **1203AFFN**	12.70	3.18	0.5	1.4	-	20°	25°	45°	●	●	○	● ●	○	●	●		●					
SEEN1203AFTN	12.70	3.18	0.5	1.4	-	20°	25°	45°	○	○								○				
SEEN1203AFFN	12.70	3.18	0.5	1.4	3.0	20°	25°	45°											○	●		○

◆ Recommended Cutting Conditions

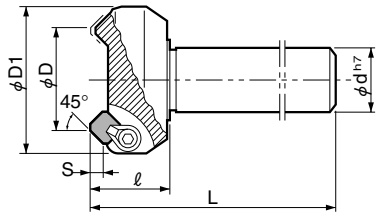
Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 120~200	★ 100~200	☆ 120~200			☆ 80~120				
Carbon Steel (SxxC)	~0.3	☆ 150~220	★ 120~200	☆ 120~200		☆ 120~200	☆ 100~180	★ 120~200			☆ 80~150				
Alloy Steel (SCM)	~0.3	☆ 120~200	★ 100~180	☆ 100~180		☆ 100~180	☆ 80~150	★ 100~180			☆ 80~150				
Metal Mold Steel (SKD/NAK)	~0.25	☆ 120~200	★ 100~180	☆ 100~180		☆ 80~150	☆ 60~130	★ 80~150			☆ 80~150				
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300		☆ 300~800	★ 300~800		☆ 300~800

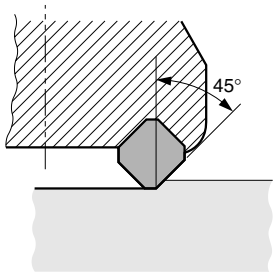
★: 1st Recommendation ☆: 2nd Recommendation

Corner Angle 45° Type [SD□□ Insert]

Facing	Chamfering
	

■ MSD45-S





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts Clamp Set	Wrench	Shim	Clamp Screw
MSD 4550	○	3	50	73	32	120	40	6.5	+16°	-3°	CPS-6M	LW-3	MSD-42	SP3X8
4563	○	3	63	87	32	120	40	6.5						
4580-32	○	4	80	104	32	120	40	6.5						

■ MSD45

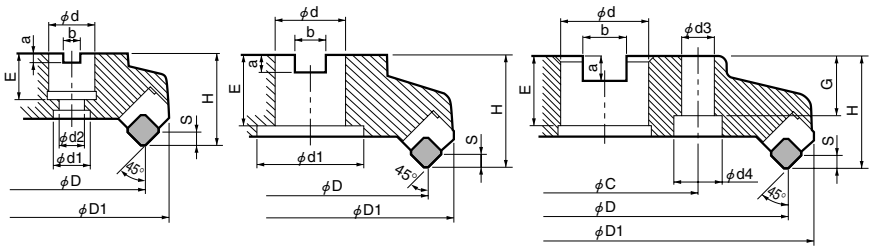


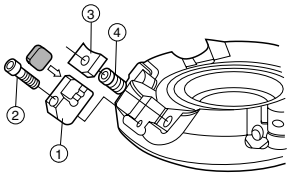
Fig.1 Fig.2 Fig.3

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	φd1	φd2	φd3	φd4	φC	H	E	G	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSD 4580R	○	4	80	106	25.40	20	14	-	-	-	50	26	-	6	9.5	6.5	+15°	-3°	Fig.1	1.9
45100R	○	5	100	126	31.75	48	-	-	-	-	60	32	-	8	12.7	6.5			Fig.2	2.9
45125R	○	6	125	151	38.10	58	-	-	-	-	60	38	-	10	15.9	6.5				4.1
45160R	○	8	160	186	50.80	68	-	-	-		60	38	-	11	19.0	6.5				6.1
45200R	○	10	200	226	47.625	-	-	18	26	101.6	60	38	38	14	25.4	6.5			Fig.3	9.3

● Spare Parts

Description	①Cartridge	②Clamp Screw	③Clamp	④Clamp Screw	Wrench
MSD 4580R 45100R 45125R 45160R 45200R	LSD-445R	HH4X16	C20R	TH8X15	TH-4

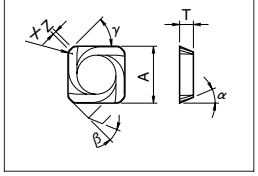


● Arbor Clamp Screw (HH12×30) is attached to MSD4580R.

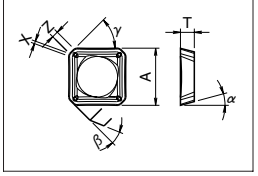
●: Std. Stock ○: Check Availability

● Applicable Insert

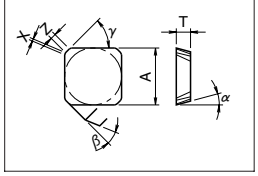
SDMR...-H



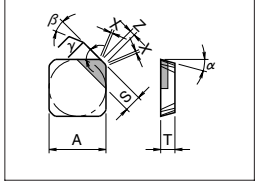
SDKR...-S



SDK(C)N...AU(T/F)N



SDKN...AUFN



Diamond

Description	Dimension (mm)					Angle (°)			Insert Grade													
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	X	Z	S	α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
SDMR1203AUER-H	12.70	3.18	R1.0	0.8	-	15°	23°	45°					○		○							
SDKR1203AUEN-S	12.70	3.18	0.5	1.7	-	15°	23°	45°		●		○		●	○							
SDCN1203AUTN	12.70	3.18	0.5	1.2	-	15°	23°	45°		○	○											
SDKN1203AUTN 1203AUFN	12.70	3.18	0.5	1.2	-	15°	23°	45°	○	●	○	○	○	○	○		●	○				
SDKN1203AUFN	12.70	3.18	0.5	1.2	3.0	15°	23°	45°												○		○

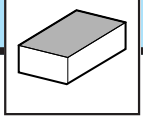
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 120~200	★ 100~200	☆ 120~200			☆ 80~120				
Carbon Steel (SxxC)	~0.3	☆ 150~220	★ 120~200	☆ 120~200		☆ 120~200	☆ 100~180	★ 120~200			☆ 80~150				
Alloy Steel (SCM)	~0.3	☆ 120~200	★ 100~180	☆ 100~180		☆ 100~180	☆ 80~150	★ 100~180			☆ 80~150				
Metal Mold Steel (SKD/NAK)	~0.25	☆ 120~200	★ 100~180	☆ 100~180		☆ 80~150	☆ 60~130	★ 80~150			☆ 80~150				
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300			★ 300~800		☆ 300~800

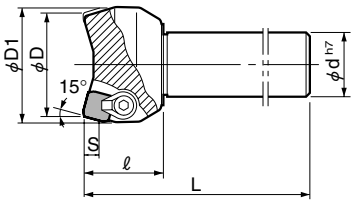
★: 1st Recommendation ☆: 2nd Recommendation

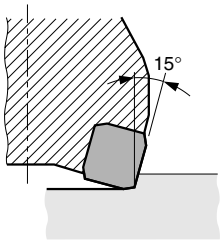
Corner Angle 15° Type [SP□□ Insert]

Facing



■ MSP15-S





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts Clamp Set	Wrench	Shim	Clamp Screw
MSP 1550	○	3	50	57	32	120	40	9	+10°	-2°	CPS-6M	LW-3	MSP-42	SP3X8
1563	○	3	63	70	32	120	40	9						

■ MSP15

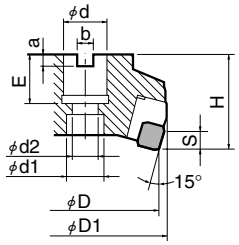


Fig.1

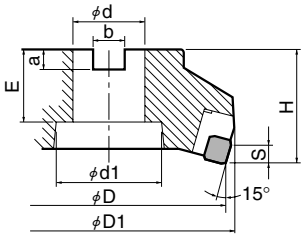


Fig.2

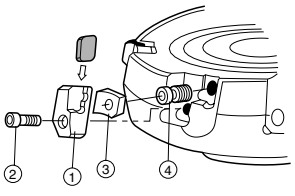
● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	φd1	φd2	H	E	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSP 1580R	○	4	80	89	25.40	20	14	50	26	6	9.5	9.5	+8°	0°	Fig.1	1.2
15100R	○	5	100	109	31.75	48	-	60	32	8	12.7	9.5			Fig.2	2.5
15125R	○	6	125	134	38.10	58	-	60	38	10	15.9	9.5				3.4

● Spare Parts

Description	①Cartridge	②Clamp Screw	③Clamp	④Clamp Screw	Wrench
MSP 1580R 15100R 15125R	LSP-415R	HH4X16	C25R	TH8X15	TH-4

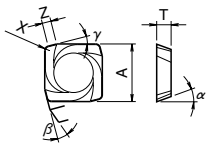
● Arbor Clamp Screw (HH12×30) is attached to MSP1580R.



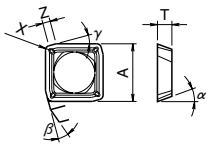
●: Std. Stock ○: Check Availability

● Applicable Insert

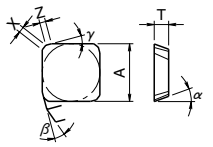
SPMR...-H



SPKR...-S



SPK(C)N...ED(T/F)R



Description	Dimension (mm)					Angle (°)			Insert Grade											
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	X	Z		α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
SPMR1203EDER-H	12.70	3.18	R1.0	2.0		11°	15°	15°					○		●							
SPKR1203EDER-S	12.70	3.18	R1.0	2.0		11°	15°	15°		●		○		●	●							
SPCN1203EDTR	12.70	3.18	R1.0	2.0		11°	15°	15°		○	○											
SPKN1203EDTR	12.70	3.18	R1.0 1.0	2.0		11°	15°	15°	○	●	○	●	○	○	●			●				
1203EDFR	12.70	3.18	1.0	1.6		11°	15°	15°									●					

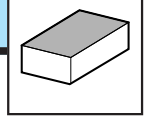
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 120~200	★ 100~200	☆ 120~200			☆ 80~120				
Carbon Steel (SxxC)	~0.3	☆ 150~220	★ 120~200	☆ 120~200		☆ 120~200	☆ 100~180	★ 120~200			☆ 80~150				
Alloy Steel (SCM)	~0.3	☆ 120~200	★ 100~180	☆ 100~180		☆ 100~180	☆ 80~150	★ 100~180			☆ 80~150				
Metal Mold Steel (SKD/NAK)	~0.25	☆ 120~200	★ 100~180	☆ 100~180		☆ 80~150	☆ 60~130	★ 80~150			☆ 80~150				
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

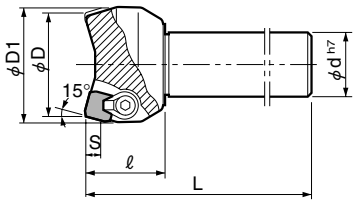
★: 1st Recommendation ☆: 2nd Recommendation

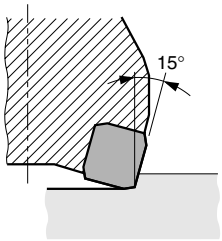
Corner Angle 15° Type [SE□□ Insert]

Facing



■ MSE15-S (High Rake type)



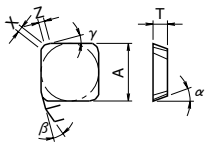


● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts: Clamp Set	Wrench	Shim	Clamp Screw
MSE 1550	○	3	50	57	32	120	40	8.5	+20°	+3°	CPS-6M	LW-3	MSE-4215	SP3X8
1563	○	3	63	71	32	120	40	8.5		+6°				
1580-32	○	4	80	87	32	120	40	8.5						

● Applicable Insert

SEKN...EFTR



Description	Dimension (mm) A	T	X	Z		Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
SEKN1203EFTR	12.70	3.18	1.2	1.4		20°	25°	15°		●	○		●		○							

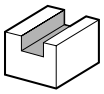
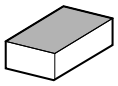
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min) Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 120~200		★ 120~200							
Carbon Steel (SxxC)	~0.25		★ 120~200	☆ 120~200		☆ 120~200		★ 120~200							
Alloy Steel (SCM)	~0.25		★ 100~180	☆ 100~180		☆ 100~180		★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.25		★ 100~180	☆ 100~180		☆ 80~150		★ 80~150							
Cast Iron (FC/FCD)	-														
Non-ferrous Metal (Aluminum)	-														

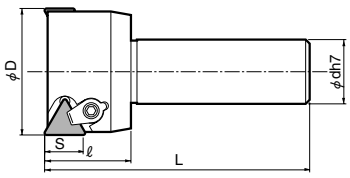
★: 1st Recommendation ☆: 2nd Recommendation

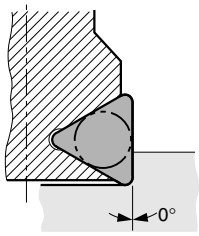
●: Std. Stock ○: Check Availability

Corner Angle 0° Type [TP□□ Insert]

Shouldering	Grooving	Facing
		

■ MTP90-S



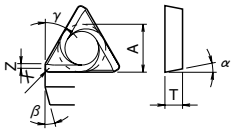


● Toolholder Dimension

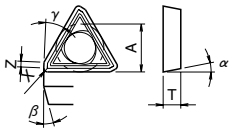
Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S	Rake Angle (°) A.R.	R.R.	Spare Parts Clamp	Double Screw	Wrench	Shim	Clamp Screw
MTP 9050	○	3	50	32	130	43	18	+8°	0°	CP-8W	W8X18	LW-4	KPT-42	SP3X8
9063	○	3	63	32	130	43	18							

● Applicable Insert

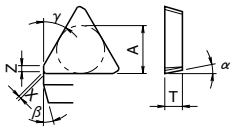
TPMR...-H



TPKR...-S



TPKN...PD(T/F)R



Description	Dimension (mm) A	T	X	Z		Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
TPMR2204PDER-H	12.70	4.76	R1.0	1.4		11°	15°	30°					○		●			●				
TPKR2204PDER-S	12.70	4.76	R1.0	1.4		11°	15°	30°		○		○		●	○							
TPKN2204PDTR 2204PDFR	12.70	4.76	0.7	1.6		11°	15°	30°	○	●	○	●	○	○	●		○	○				

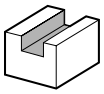
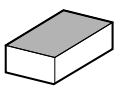
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min) Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.25		☆ 120~200	☆ 120~200		☆ 100~200	★ 100~200	☆ 100~200			☆ 80~120				
Carbon Steel (SxxC)	~0.3	☆ 100~200	★ 100~220	☆ 100~220		☆ 100~200	☆ 100~180	★ 100~200			☆ 80~150				
Alloy Steel (SCM)	~0.3	☆ 100~200	★ 100~200	☆ 100~200		☆ 80~180	☆ 80~150	★ 100~180			☆ 80~150				
Metal Mold Steel (SKD/NAK)	~0.25	☆ 100~180	★ 100~200	☆ 100~200		☆ 60~150	☆ 60~130	★ 80~150			☆ 80~150				
Cast Iron (FC/FCD)	~0.3				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

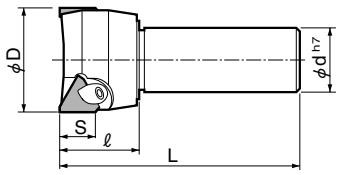
★: 1st Recommendation ☆: 2nd Recommendation

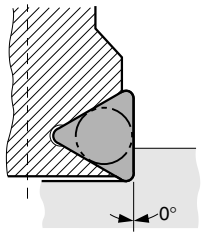
●: Std. Stock ○: Check Availability

Corner Angle 0° Type [TE□□ Insert]

Shouldering	Grooving	Facing
		

■ MTE90-S (High Rake type)





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Spare Parts Clamp	Double Screw	Wrench	Shim	Clamp Screw
MTE 9050	○	3	50	32	120	40	17		+13°	+3°	CP-8TE	W8X18	LW-4	MTE-42	SP3X8
9063	○	3	63	32	120	40	17		+13°	+5°					
9080-32	○	4	80	32	120	40	17		+16°	+6°					

■ MTE90 (High Rake type)

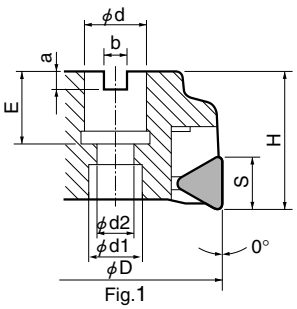


Fig.1

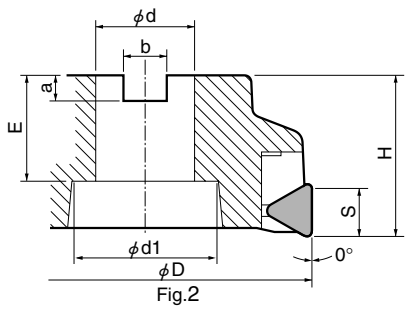


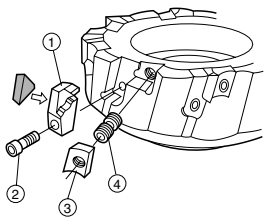
Fig.2

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	φd1	φd2	H	E	a	b	S					Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MTE 9080R	○	4	80	25.40	20	14	50	26	6	9.5	17					+16°	+6°	Fig.1	1.3
90100R	○	5	100	31.75	26	18	60	32	8	12.7	17								2.3
90125R	○	6	125	38.10	58	-	60	38	10	15.9	17							Fig.2	3.2
90160R	○	8	160	50.80	68	-	60	38	11	19.0	17								5.3

● Spare Parts

Description	①Cartridge	②Clamp Screw	③Clamp	④Clamp Screw	Wrench
MTE 9080R 90100R 90125R 90160R	LTE-490R	HH4X16	C17R	W8X18	TH-4

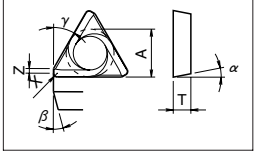


- Arbor Clamp Screw (HH12×30) is attached to MTE9080R.
- Arbor Clamp Screw (HH16×40) is attached to MTE90100R.

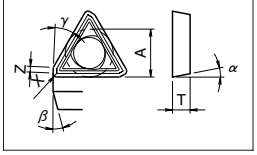
●: Std. Stock ○: Check Availability

● Applicable Insert

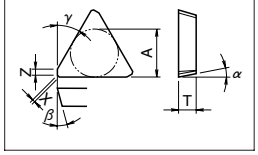
TEMR...-H



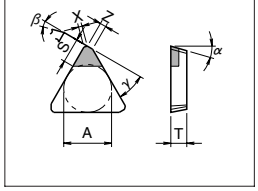
TEKR...S



TEK(E)N...PT(T/F)R



TEKN...PTFR



Diamond

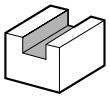
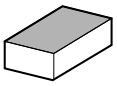
Description	Dimension (mm)					Angle (°)			Insert Grade												
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	X	Z	S	α	β	γ	TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
TEMR2204PTER-H	12.70	4.76	R1.0	1.4	-	20°	22°	30°					○		●							
TEKR2204PTER-S	12.70	4.76	R1.0	1.4	-	20°	22°	30°		○		○		●	●							
TEEN2204PTTR	12.70	4.76	R1.0	1.4	-	20°	22°	30°	○	○	○							○				
TEKN2204PTTR	12.70	4.76	R1.0 0.7	1.4	-	20°	22°	30°	○	●	○	●	○	○	○			○				
2204PTFR	12.70	4.76	0.7	1.4	-	20°	22°	30°									●					
TEKN2204PTFR	12.70	4.76	0.7	1.8	4.0	20°	22°	30°												○		○

◆ Recommended Cutting Conditions

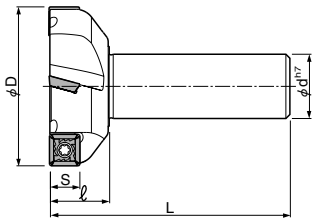
Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.2		☆ 120~200	☆ 120~200		☆ 120~200	★ 100~200	☆ 120~200			☆ 80~120				
Carbon Steel (SxxC)	~0.25	☆ 150~220	★ 120~200	☆ 120~200		☆ 120~200	☆ 100~180	★ 120~200			☆ 80~150				
Alloy Steel (SCM)	~0.25	☆ 120~200	★ 100~180	☆ 100~180		☆ 100~180	☆ 80~150	★ 100~180			☆ 80~150				
Metal Mold Steel (SKD/NAK)	~0.2	☆ 120~200	★ 100~180	☆ 100~180		☆ 80~150	☆ 60~130	★ 80~150			☆ 80~150				
Cast Iron (FC/FCD)	~0.25				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300			★ 300~800		☆ 300~800

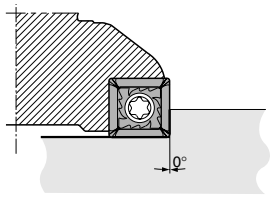
★: 1st Recommendation ☆: 2nd Recommendation

Corner Angle 0° Type [SEMM Insert]

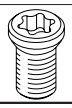
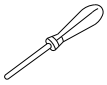
Shouldering	Grooving	Facing
		

■ MSO90-S





● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Spare Parts Clamp Set	Wrench			
															
MSO 9050-S32-09	○	3	50	32	120	30	7		+12°	-9°	SB-3080TR	DT-10			
9063-S32-09	○	4	63	32	120	30	7			-9°					
9080-S32-09	○	4	80	32	120	30	7			-7°					
MSO 9050-S32-15	○	3	50	32	120	30	13		+15°	-10°	SB-5085TR	DT-20			
9063-S32-15	○	4	63	32	120	30	13			-9°					
9080-S32-15	○	4	80	32	120	30	13			-8°					

■ MSO90

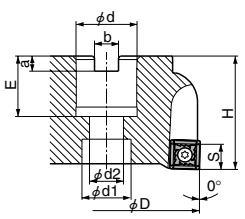


Fig.1

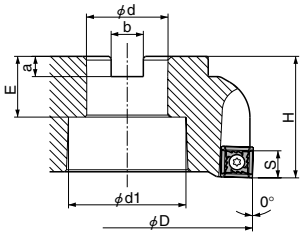


Fig.2

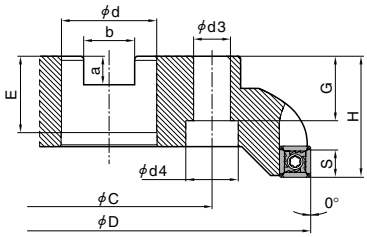


Fig.3

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	φd1	φd2	φd3	φd4	φC	H	E	G	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSO 90080R-09	○	4	80	25.40	20	14	-	-	-	50	26	-	6	9.5	7	+12°	-9°	Fig.1	1.3
90100R-09	○	5	100	31.75	48	-	-	-	-	60	32	-	8	12.7	7			Fig.2	1.9
90125R-09	○	6	125	38.10	59	-	-	-	-	60	38	-	10	15.9	7				3.0
MSO 90080R-15	○	4	80	25.40	20	14	-	-	-	50	26	-	6	9.5	13	+15°	-8°	Fig.1	1.3
90100R-15	○	5	100	31.75	48	-	-	-	-	60	32	-	8	12.7	13			Fig.2	1.9
90125R-15	○	6	125	38.10	59	-	-	-	-	60	38	-	10	15.9	13				3.0
90160R-15	○	8	160	50.80	68	-	-	-	-	60	38	-	11	19.0	13				4.8
90200R-15	○	10	200	47.625	-	-	18	26	101.6	60	38	32	14	25.4	13			Fig.3	7.8
MSO 9050R-09E-3T		3																	
9050R-09E-4T	○	4	50	22	18	12	-	-	-	44	20	-	6.3	10.4	7	+12°	-10°	Fig.1	0.4
9050R-09E-5T	●	5																	
9063R-09E-4T	●	4	63	22	18	12	-	-	-	40	20	-	6.3	10.4	7	+12°	-10°	Fig.1	0.9
9063R-09E-6T	●	6																	
9080R-09E-4T	●	4	80	27	20	14	-	-	-	50	22	-	7.2	12.4	7	+12°	-9°	Fig.1	1.3
9080R-09E-8T	●	8																	
90100R-09E-5T	○	5																	
90100R-09E-7T	○	7	100	32	48	-	-	-	-	60	28	-	8.0	14.4	7	+12°	-9°	Fig.2	1.9
90100R-09E-10T	●	10																	
90125R-09E-6T	●	6																	
90125R-09E-8T	○	8	125	40	58	-	-	-	-	60	30	-	9.0	16.4	7	+12°	-9°	Fig.2	3.0
90125R-09E-12T	●	12																	
90160R-09E-8T	●	8																	
90160R-09E-12T	○	12	160	40	68	-	-	-	-	60	30	-	10.0	16.4	7	+12°	-9°	Fig.2	4.8
90160R-09E-15T	●	15																	

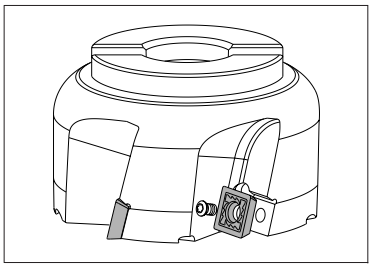
●: Std. Stock ○: Check Availability

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	φd1	φd2	φd3	φd4	φC	H	E	G	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSO 9050R-15E-3T	●	3	50	22	14.2	10.5	-	-	-	44	20	-	6.3	10.4	13	+15°	-10°	Fig.1	0.4
9050R-15E-4T	○	4								44	20								
9063R-15E-4T	●	4	63	22	18	12	-	-	-	40	20	-	6.3	10.4	13	+15°	-10°	Fig.1	0.9
9063R-15E-5T	○	5								40	20								
9080R-15E-4T	●	4	80	27	20	14	-	-	-	50	22	-	7.2	12.4	13	+15°	-9°	Fig.1	1.3
9080R-15E-6T	○	6								50	22								
90100R-15E-5T	●	5	100	32	48	-	-	-	-	60	28	-	8.0	14.4	13	+15°	-8°	Fig.2	1.9
90100R-15E-6T	○	6								60	28								
90125R-15E-6T	●	6	125	40	58	-	-	-	-	60	30	-	9.0	16.4	13	+15°	-8°	Fig.2	3.0
90160R-15E-8T	●	8	160	40	68	-	-	-	-	60	30	-	10.0	16.4	13	+15°	-8°	Fig.2	4.8

● Spare Parts

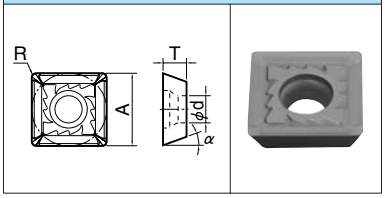
Description	Clamp Screw	Wrench
MSO 90···R-09 90···R-09E-···T	SB-3080TR	DT-10
MSO 90···R-15 90···R-15E-···T	SB-5085TR	DT-20



- Arbor Clamp Screw (HH12×30) is attached to MSO9080R-09 & MSO9080R-15.
- Arbor Clamp Screw (HH10×25) is attached to MSO9050R-09E type & MSO9050R-15E type.
- Arbor Clamp Screw (HH10×30) is attached to MSO9063R-09E type & MSO9063R-15E type.
- Arbor Clamp Screw (HH12×25) is attached to MSO9080R-09E type & MSO9080R-15E type.

● Applicable Insert

SEMM...



Milling Cutter	Insert
MSO90····09	SEMM09T308PESR
MSO90····15	SEMM150408PESR

Description	Dimension (mm) A	T	φd	R		Angle (°) α			Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
SEMM09T308PESR	9.525	3.97	3.4	0.8		20°				●		●	○	●	●		●					
SEMM150408PESR	15.875	4.76	5.5	0.8		20°				●		●	○	●	●		●					

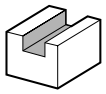
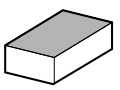
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min) Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.2		☆ 120~200			☆ 120~200	★ 100~200	☆ 120~200							
Carbon Steel (SxxC)	~0.2		★ 120~200			☆ 120~200	☆ 100~180	★ 120~200							
Alloy Steel (SCM)	~0.2		★ 100~180			☆ 100~180	☆ 80~150	★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.2		★ 100~180			☆ 80~150	☆ 60~130	★ 80~150							
Cast Iron (FC/FCD)	~0.2				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

●: Std. Stock ○: Check Availability

Corner Angle 0° Type [ND□□ Insert]

Shouldering	Grooving	Facing
		

■ MFB

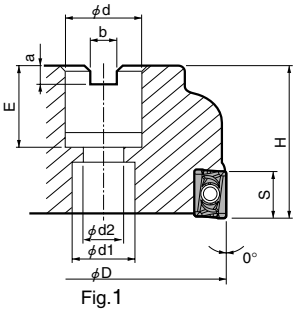


Fig.1

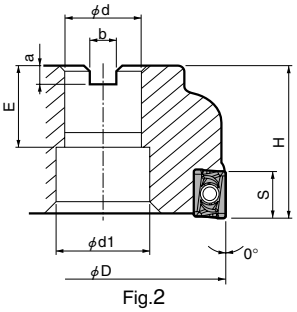
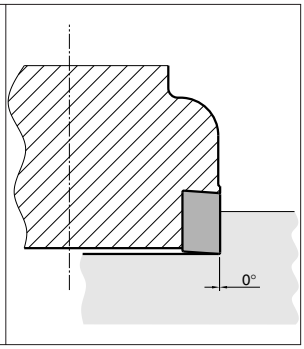


Fig.2

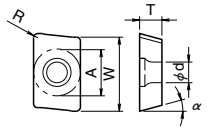


● Toolholder Dimension

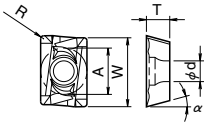
Description	Stock	No. of Insert	Dimension (mm) φD	φd	φd1	φd2	H	E	a	b	S	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MFB 63R	○	6	63	25.40	20	13	50	26	6	9.5	14.5	+11°	-5°	Fig.1	0.8
80R	○	7	80	25.40	20	13	50	26	6	9.5	14.5		-4°		1.1
100R	○	8	100	31.75	46	-	60	32	8	12.7	14.5		-3°	Fig.2	1.9
125R	○	9	125	38.10	58	-	60	38	10	15.9	14.5		-2°		3.0
160R	○	10	160	50.80	68	-	60	38	11	19.0	14.5		-2°		5.2
MFB 50R-E-5T	●	5	50	22	18	12	44	20	6.3	10.4	14.5	+11°	-6°	Fig.1	0.7
63R-E-6T	●	6	63	22	20	12	50	26	6.3	10.4	14.5		-5°		0.8
80R-E-8T	●	8	80	27	20	13	50	26	7.3	12.4	14.5		-4°		1.1
100R-E-10T	●	10	100	32	50	-	60	32	8.0	14.4	14.5		-5°	Fig.2	1.9
125R-E-12T	●	12	125	40	60	-	60	38	10.0	16.4	14.5		-9°		3.0
160R-E-15T	●	15	150	40	70	-	60	30	10.0	16.4	14.5		-7°		5.2

● Applicable Insert

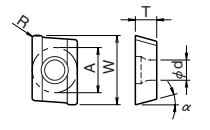
NDKW...(E/T)R



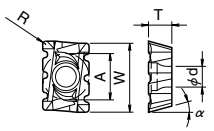
NDKT...(E/T)R-V



NDKT...TR



NDKT...ER-N3



3-Nicked

● Spare Parts

Description	Clamp Screw	Wrench
MFB 63R, 80R, 100R, 125R, 160R	SB-4085TR	DT-15
MFB 50R-E-5T, 63R-E-6T, 80R-E-8T, 100R-E-10T, 125R-E-12T, 160R-E-15T	SB-4085TR	DT-15

- Arbor Clamp Screw (HH12×30) is attached to MFB63R and MFB80R.
- Arbor Clamp Screw (HH10×30) is attached to MFB50R-E-5T.

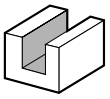
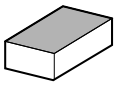
Description	Dimension (mm) A	T	φd	W	R	Angle (°) α			Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
NDKW 150408ER	10.00	4.76	4.4	15.9	0.8	15°				○		●		○	●		●					
150408TR															●							
150412ER					1.2									●								
NDKT 150408TR	10.00	4.76	4.4	15.9	0.8	15°									●							
NDKT 150408ER-V	10.00	4.76	4.4	15.9	0.8	15°				●		●	○	●	●		●					
150408TR-V														●	●	●						
150416ER-V					1.6									●								
NDKT 150408ER-N3	10.00	4.76	4.4	15.9	0.8	15°				○		○	○	○	○		○					

- IMPORTANT: See P. 398-399 for Nicked Insert's installation

◆ Recommended Cutting Conditions P.360

●: Std. Stock ○: Check Availability

Corner Angle 0° Type [NDMM Insert]

Shouldering	Deep Grooving	Facing
		

■ MSM

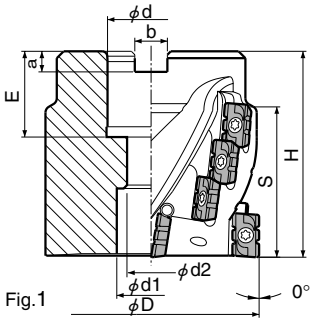


Fig.1

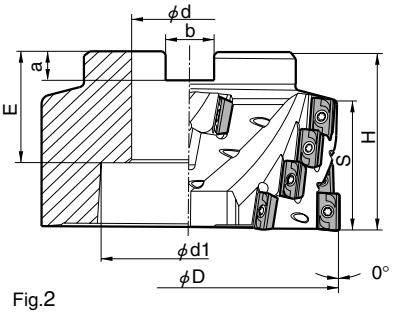
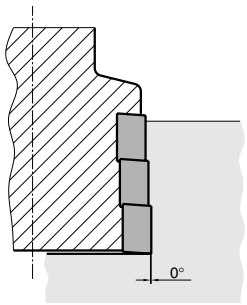


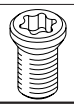
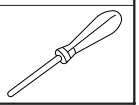
Fig.2



● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	φd1	φd2	H	E	a	b	S				Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
MSM 63	○	16	4	63	25.40	20	14	60	25	6	9.5	43				+9°	0°	Fig.1	0.9
80	○	16	4	80	31.75	26	18	60	32	8	12.7	43				+9°	0°	Fig.1	1.3
100	○	24	6	100	38.10	58	-	60	38	10	15.9	43				+9°	0°	Fig.2	1.8
MSM 63-E	●	16	4	63	22	18	12	60	20	6.3	10.4	43				+9°	0°	Fig.1	0.9
80-E	●	16	4	80	27	20	14	60	22	7.2	12.4	43				+9°	0°	Fig.1	1.3
100-E	●	24	6	100	32	48	-	60	28	8.0	14.4	43				+9°	0°	Fig.2	1.8

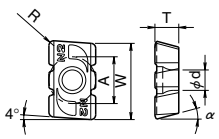
● Spare Parts

Description	Clamp Screw	Wrench
		
MSM 63 / 80 / 100	SB-3080TR	DT-10
MSM 63-E / 80-E / 100-E	SB-3080TR	DT-10

- Arbor Clamp Screw (HH12×40) is attached to MSM63.
- Arbor Clamp Screw (HH16×40) is attached to MSM80 and MSM80-E.
- Arbor Clamp Screw (HH10×25) is attached to MSM63-E.

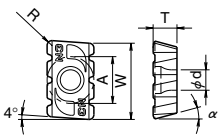
● Applicable Insert

NDMM...-N2



2-Nicked

NDMM...-N3



3-Nicked

Description	Dimension (mm) A	T	φd	W	R	Angle (°) α			Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
NDMM12T308ER-N2	7.79	3.97	3.4	12.7	0.8	15°				●		●		●	●		●					
NDMM12T308ER-N3	7.79	3.97	3.4	12.7	0.8	15°				●		●		●	●		●					

- IMPORTANT: See P. 402-403 for Nicked Insert's installation

◆ Recommended Cutting Conditions

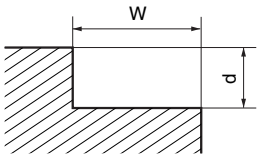
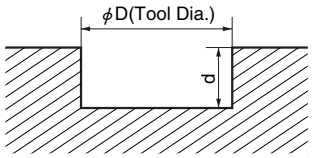
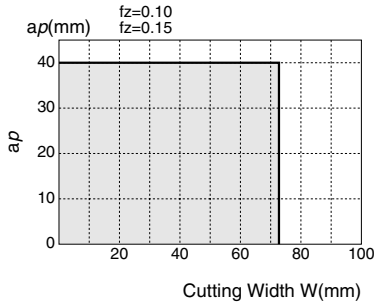
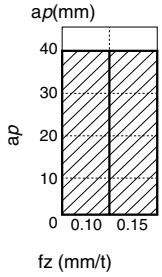
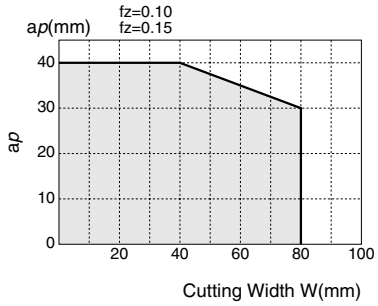
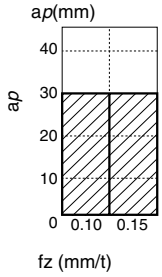
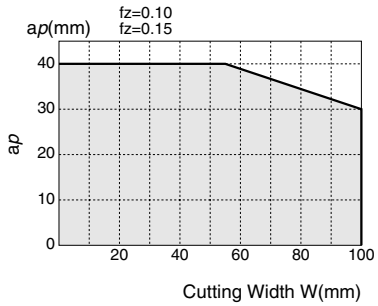
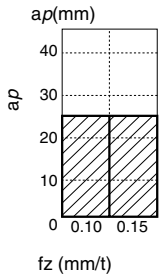
Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min) Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.2		☆ 100~200				★ 60~150	☆ 80~180							
Carbon Steel (SxxC)	~0.2		★ 100~200				☆ 60~150	★ 80~180							
Alloy Steel (SCM)	~0.2		★ 80~180				☆ 60~150	★ 80~180							
Metal Mold Steel (SKD/NAK)	~0.2		★ 80~180				☆ 60~130	★ 60~150							
Cast Iron (FC/FCD)	~0.25				★ 60~150					☆ 60~130					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

●: Std. Stock ○: Check Availability

Corner Angle 0° Type MSM

◆ Cutting Performance of MSM Series

Work Material	Shouldering	Grooving
S50C		
Description		
MSM63	Cutting Speed V_C=60~120m/min	Cutting Speed V_C=60~100m/min
		
MSM80	Cutting Speed V_C=60~120m/min	Cutting Speed V_C=60~100m/min
		
MSM100	Cutting Speed V_C=60~100m/min	Cutting Speed V_C=50~80m/min
		

●Cutting Conditions

- V_C : See the left table.
- fz : Varied
- *ap* : Varied
- Insert : NDMM12T308ER-N2/N3
- Coolant : No (Dry Cutting)
- Machine : Spindle power AC15/18.5kw Machining Center

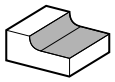
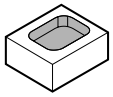
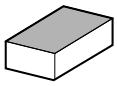
· Cutting Performance depends on machine's rigidity and spindle power

◆ Reccomended Cutting Conditions (MFB Series)

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100	TC60M	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.2		☆ 120~200			☆ 120~200	★ 100~200	☆ 120~200							
Carbon Steel (SxxC)	~0.25		★ 120~200			☆ 120~200	☆ 100~180	★ 120~200							
Alloy Steel (SCM)	~0.25		★ 100~180			☆ 100~180	☆ 80~150	★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.2		★ 100~180			☆ 80~150	☆ 60~130	★ 80~150							
Cast Iron (FC/FCD)	~0.25				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.2									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

Radius Mill [RPMT Insert]

Curved Facing	Pocketing	Facing
		

■ MRP

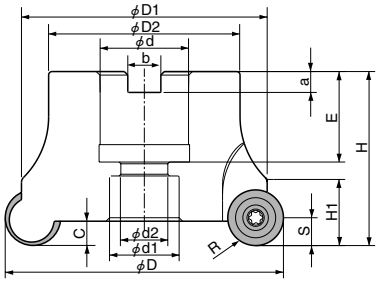


Fig.1

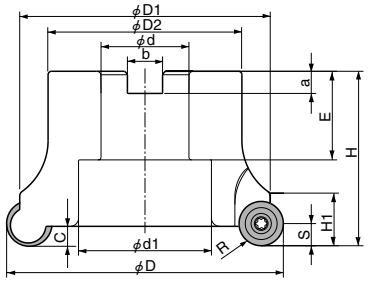


Fig.2

● Toolholder Dimension

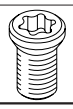
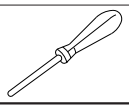
Description	Stock	No. of Insert	Dimension (mm)															Rake Angle (°)		Shape	Weight (kg)
			R	ϕD	ϕD1	ϕD2	ϕd	ϕd1	ϕd2	H	H1	E	a	b	C	Pd	S	A.R.	R.R.		
NEW MRP 050R-10-6T	○	6	5	50	45.0	38	22.0	18	12	50	13	20	6.3	10.4	3.5	2.5	5.0	+5°	-5°	Fig.1	0.4
NEW 063R-10-7T	○	7		63	57.9	50	25.4	20	14	50	13	26	6.0	9.5	3.5	2.5					0.5
MRP 050R-12	○	4	6	50	41.4	38	22.0	18	12	50	15	20	6.3	10.4	5.0	4.0	6.0	+5°	-5°	Fig.1	0.4
063R-12	○	5		63	54.4	50	25.4	20	14	50	15	26	6.0	9.5	5.0	4.0					0.5
080R-12	○	6		80	71.4	55	25.4	20	14	50	15	26	6.0	9.5	5.0	4.0			-3°		0.7
NEW 080R-12-7T	○	7		80	74.4	59	25.4	20	14	50	15	26	6.0	9.5	4.5	3.5			-5°		
MRP 080R-16	●	5	8	80	70.6	55	25.4	20	14	50	19	26	6.0	9.5	7.0	6.0	8.0	+5°	-3°	Fig.1	0.8
100R-16	○	6		100	90.5	70	31.75	48	-	63	19	32	8.0	12.7	7.0	6.0			-5°	Fig.2	1.0
NEW 100R-16-7T	○	7		100	93.0	70	31.75	48	-	63	19	32	8.0	12.7	6.0	5.0			-6°		1.0
125R-16	○	6		125	115.5	80	38.10	58	-	63	19	38	10.0	15.9	7.0	6.0			-5°		1.7
NEW 125R-16-8T	○	8		125	118.0	80	38.10	58	-	63	19	38	10.0	15.9	6.0	5.0			-6°		1.7
MRP 080R-20	○	4	10	80	67.3	55	25.4	20	14	50	23	24	6.0	9.5	8.5	N.A.	10.0	+5°	-3°	Fig.1	0.8
100R-20	○	5		100	87.3	70	31.75	48	-	63	23	32	8.0	12.7	8.5	N.A.			-5°	Fig.2	1.0
MRP 052R-10E-6T	●	6	5	52	47.0	41	22	18	11.0	50	13.0	20	6.3	10.4	3.5	2.5	5.0	+5°	-5°	Fig.1	0.4
066R-10E-7T	●	7		66	60.9	49	27	20	13.5	50	13.0	22	7.0	12.4	3.5	2.5		+5°	-5°		0.5
MRP 080R-12E-7T	●	7	6	80	74.4	59	27	20	13.5	50	14.0	22	7.0	12.4	4.6	3.6	6.0	+5°	-5°	Fig.1	0.8
MRP 100R-16E-7T	●	7	8	100	93.0	70	32	45	-	55	18.4	30	8.0	14.4	6.0	5.0	8.0	+5°	-6°	Fig.2	1.0
125R-16E-8T	●	8		125	118.0	80	40	60	-	55	18.4	30	9.0	16.4	6.0	5.0		+5°	-6°		1.7

- Pd: Max. Plunging Depth
- Use BT○○-FMC22 (TMT Standard in the market) for MRP050R-10-6T and MRP050R-12.

MRP-S Endmill
(Cutting Dia. ϕ12～ϕ63) P.422

Radius Mill [RPMT Insert]

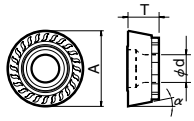
● Spare Parts

Description	Clamp Screw	Wrench			
					
MRP 050R-10-6T 063R-10-7T	SB-3080TR	DT-10			
MRP 050R-12 063R-12	SB-40115TR	DT-15			
080R-12 080R-12-7T	SB-4085TR				
MRP 080R-16 100R-16 100R-16-7T 125R-16 125R-16-8T	SB-50120TR	DT-20			
MRP 080R-20 100R-20	SB-60120TR	DT-25			
MRP 052R-10E-6T 066R-10E-7T	SB-3080TR	DT-10			
MRP 080R-12E-7T	SB-4085TR	DT-15			
MRP 100R-16E-7T 125R-16E-8T	SB-50120TR	DT-20			

- Arbor Clamp Screw (HH10×30) is attached to MRP050R.
- Arbor Clamp Screw (HH12×25) is attached to MRP063R and MRP066R-10E-7T.
- Arbor Clamp Screw (HH12×25) is attached to MRP080R and MRP080R-12E-7T.
- Arbor Clamp Screw (HH10×25) is attached to MRP052R-10E-6T.

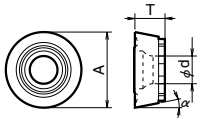
● Applicable Insert

RPMT...-H



Tough Edge

RPMT...



Low Cutting Force

Milling Cutter	Insert	
MRP····10	-	RPMT10T3M0
MRP····12	RPMT1204M0-H	RPMT1204M0
MRP····16	RPMT1606M0-H	-
MRP····20	RPMT2006M0-H	-

Description	Dimension (mm)					Angle (°)			Insert Grade												
									Cermet			PVD Coated					Carbide		Diamond			
	A	T	ϕd	W	R	α			TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
RPMT 10T3M0	10.0	3.97	3.4	-	5	11°				●		●		●	●		○					
RPMT 1204M0-H	12.0	4.76	4.4	-	6	11°				●		●		●	●		○					
1204M0				-								●		●	●		○					
RPMT 1606M0-H	16.0	6.35	5.5	-	8	11°				●		●		●	●		○					
RPMT 2006M0-H	20.0	6.35	6.5	-	10	11°						○		○	○		○					

◆ Recommended Cutting Conditions

Work Material	f (mm/tooth)	Recommended Insert Grade (V_C Speed: m/min)													
		Cermet			PVD Coated					Carbide		Diamond			
		TN60	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304)	~0.4		☆ 120~200				★ 100~200	☆ 120~200							
Carbon Steel (SxxC)	~0.6		★ 120~200				☆ 100~180	★ 120~200							
Alloy Steel (SCM)	~0.6		★ 100~180				☆ 80~150	★ 100~180							
Metal Mold Steel (SKD/NAK)	~0.5		★ 100~180				☆ 60~130	★ 80~150							
Cast Iron (FC/FCD)	~0.6				★ 80~180					☆ 80~150					
Non-ferrous Metal (Aluminum)	~0.6									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

●: Std. Stock ○: Check Availability

● Guide for Drilling

[Depth of Drilling]

· See "Pd" value of toolholder dimension chart. (Pd Shows the maximum plunge depth.)

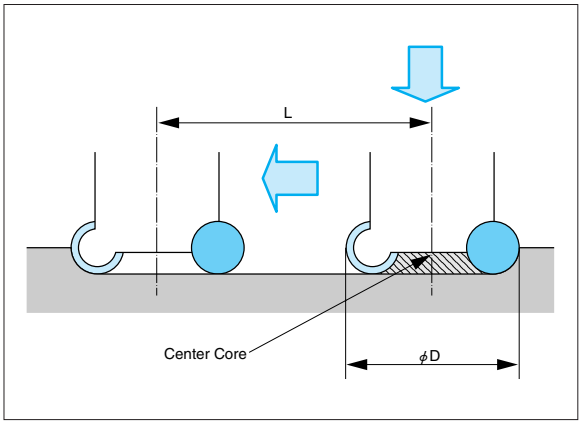
[Traversing after Drilling]

When traversing subsequent to the drilling.

①Decrease the table feed down to the half of the normal traversing, until the center core part is completely milled off. (Because the internal cutting edge's radial rake angle is large to the negative direction)

②The Min. transfer length “L” to make the flat face is as follows.

Insert	L(mm)
RPMT10T3M0	ϕD-9
RPMT1204M0 RPMT1204M0-H	ϕD-11
RPMT1606M0-H	ϕD-15



● Guide for Ramping

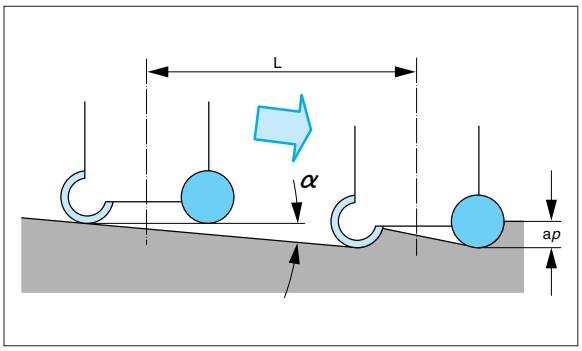
The transfer length “L” at the maximum. slant angle α in the ramping operation depends on a*p*

Milling Cutter	Angle α(°)	tan α
MRP050R-10-6T	4°	0.070
063R-10-7T	3°	0.052
MRP050R-12	7°	0.123
063R-12	5°	0.087
080R-12	3°	0.052
080R-12-7T	3°	0.052
MRP080R-16	6°	0.105
100R-16	4°	0.070
100R-16-7T	3°	0.052
125R-16	3°	0.052
125R-16-8T	2°	0.035
MRP080R-20	8°	0.141
100R-20	6°	0.105
MRP052R-10E-6T	3.5°	0.061
066R-10E-7T	2.5°	0.044
MRP080R-12E-7T	3°	0.052
MRP100R-16E-7T	4°	0.070
125R-16E-8T	4°	0.070

● Above is the value considering the clearance 1mm between the tool body and the work.

Formula for the Transfer Length “L” at max. Slant Angle

$$L = \frac{ap}{\tan \alpha}$$



EB Single Point Cutter (Single Insert type)

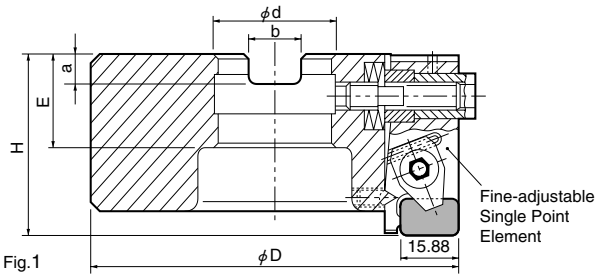


Fig.1

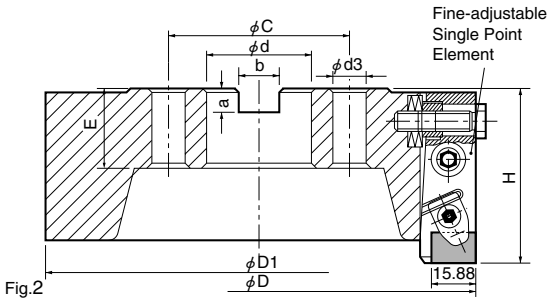
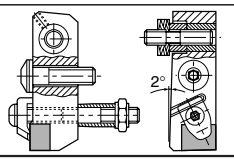


Fig.2

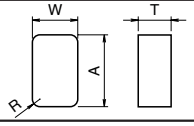
Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) ϕD	ϕD1	ϕd	ϕd3	ϕC	H	E	a	b	Rake Angle (°) A.R.	R.R.	Shape	Weight (kg)
EB -100R16	○	1	100	-	32	-	-	50	25	8	14.4	-6°	0°	Fig.1	3.0
-125R16	○	1	125	-	40	-	-	63	29	9	16.4				4.0
-160R16	○	1	160	170	40	14	66.7	63	29	9.5	16.4			Fig.2	6.8
-200R16	○	1	200	205	60	18	101.6	63	32	14	25.7				9.7
-250R16	○	1	250	255	60	18	101.6	63	32	14	25.7				16.1

Spare Parts

Description	Element	Shape
EB -100R16	**770.73.006.05**	 Spare Parts • Wrench LW-3 LW-4
-125R16		
-160R16	**770.73.005.05**	
-200R16		
-250R16		

Applicable Insert

Shape	Description	Dimension (mm) A	T	ϕd	W	R	Angle (°) α	Insert Grade Ceramic A65
 	**LNGN150720TN**	15.875	7.94	-	10.0	2.0	-	○

Applicable Arbor

Description	For Machining Center (TMT Std.)	For Conventional Machine (MST Std.)
EB-100R16	BT40/50-FMSB32※	NT40M/U-FMSB32-30,NT50M/U-FMSB32-30
-125R16	BT50-FMB40, BT40/50-FMSA40※	NT40M/U-FMSA40-30,NT50M/U-FMSA40-30
-160R16	BT50-FMB40(F), BT50-FMSA40※	
-200R16	BT50-FMB60	FA60-NT50M/U※, NT50-60M/U※※
-250R16		

※SECODEX Standard ※※SANDVIK Coromant Standard

●: Std. Stock ○: Check Availability

◆ Cutting Speed

Set up cutting speed in the range as follows:

Work Material	Recommended V_C Speed (m/min)	V_C Speed Range (m/min)
Gray Cast Iron (～250HB)	600	100～1000

◆ *ap* and fz

- Single Point Cutter targets the super finishing of surface roughness 2-6 μm Rz, and the recommended cutting conditions are:
  - · *ap* = 0.05mm
  - · f = 0.5～5.0mm/tooth
- If f is below 1.5mm/tooth, *ap*. is available up to 0.2mm. (Optimum conditions depend on material, chucking condition and machine quality.)

◆ Application

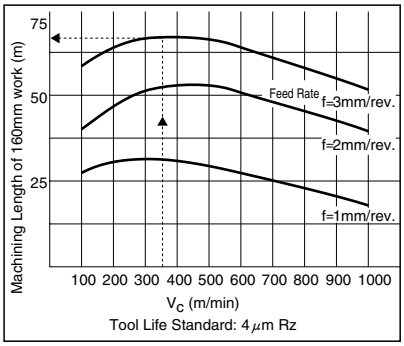
1. Grinding Process Rationalization
   Most suitable for cost & time reduction at grinding process for better surface finish and precise dimension.
2. Productivity Improvement at Finishing
   Easy preparation only by replacing the insert.
   It increases the machine operation rate and greatly improves the productivity.
3. Surface Quality Improvement
   It improves quality very much and increases the commercial value of the product.

◆ Tool Life

Tool life of A65 insert used for Single Point Cutter is affected by cutting conditions, work and machine.
The relationship among the tool life standard based on the surface roughness 4 μm Rz, f and V_C is shown below.

(e.g.) When machining FC300 (width:160mm) work at f=3mm/rev and V_C=350m/min, surface roughness exceeds 4 μmRz at cutting length 70m.

Machining of Gray Cast Iron (FC300)



◆ How to Adjust the Cutting Edge Position of Single Point Cutter

- Single Point Cutter's cutting edge must be positioned strictly in parallel with the work surface to obtain good surface finish. When requiring better surface finish than 4 μm Rz, adjust the cutting edge to make the difference at both ends within 5 μm of the dial gauge indication as shown in Fig. 1.
  Prepare the following items for the edge position adjustment.
  - Dial Gauge (scale unit: 0.001mm or 0.01mm)
  - Dial Gauge Stand
  - Surface Plate
  - Hand tools: Hexagonal wrench LW-1.5, 3, 4, and Spanner (Jaw distance 12mm), 1 piece each.

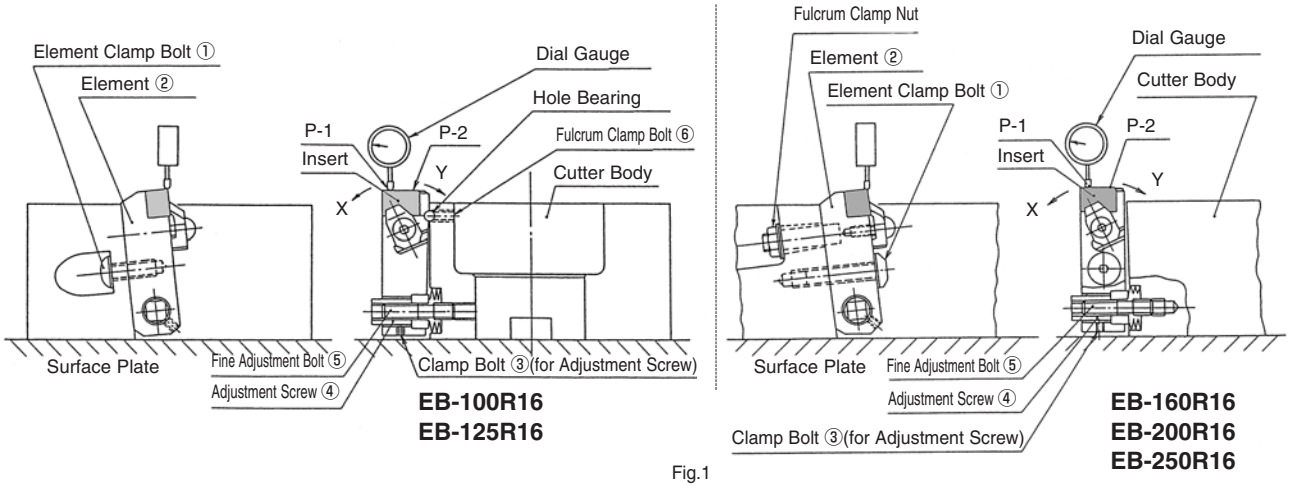


Fig.1

◆ How to Adjust the Cutting Edge Position

- Put the cutter body on the surface plate with the insert upward
- Set the dial gauge at P-1 position of the insert, and slide the cutter body back and forth to read the max. height at P-1. Then read the max. height at P-2 position using the same way as P-1.

→ ※ When the difference of the dial gauge indication is less than 5 μm ⟶ No need to adjust.

→ ※ When the difference of the dial gauge indication is 5 μm or over

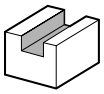
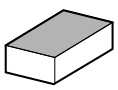
EB-100R16 EB-125R16	EB-160R16 EB-200R16 EB-250R16
1) Slightly loosen the Element Clamp Bolt ①. If it is loosened too much, be careful that element ② moves toward Y-direction when tightening the bolt after adjustment. 2) Loosen the Clamp Bolt ③. 3) Slightly loosen the Fulcrum Clamp Bolt ⑥ (just minimally). 4) Turn the Adjustment Screw ④. If it is turned counterclockwise, the Element ② moves toward the X-direction in the Fig.1. Repeat the process 3) and 4) by turns. It means that the adjustment is performed by loosening Fulcrum Clamp Bolt ⑥, when Adjustment Screw ④ is tightened well. 5) Tighten the Fulcrum Clamp Bolt ⑥. 6) When the difference of the dial gauge indication becomes less than 5 μm, the adjustment is completed. 7) Tighten the Clamp Bolt ③. ● If the difference of the dial gauge indication is less than 10 μm, the edge position can be controlled by Fine Adjustment Bolt ⑤ only, instead of the above process 2) to 7). If it is turned counterclockwise, the Element ② moves toward the X-direction in the Fig.1. 8) Tighten the Element Clamp Bolt ①. 9) Check the dial gauge indication again.	1) Slightly loosen the Element Clamp Bolt ①. If it is loosened too much, be careful that element ② moves toward Y-direction when tightening the bolt after adjustment. 2) Loosen the Clamp Bolt ③. 3) Turn the Adjustment Screw ④. If it is turned counterclockwise, the Element ② moves toward the X-direction in the Fig.1. 4) Adjustment is completed when the difference of the dial gauge indication becomes less than 5 μm. 5) Tighten the Clamp Bolt ③. ● If the difference of the dial gauge indication is less than 10 μm, the edge position can be controlled by Fine Adjustment Bolt ⑤ only, instead of the above process 2) to 5). If it is turned counterclockwise, the Element ② moves toward the X-direction in the Fig.1. 6) Tighten the Element Clamp Bolt ①. 7) Check the dial gauge indication again.

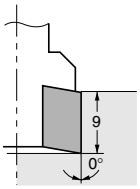
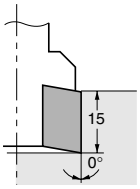
(Note) Avoid the unnecessary breakup of the element in order to maintain the preciseness.

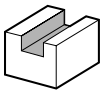
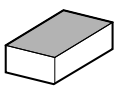
Endmilling

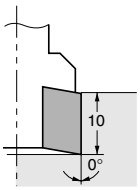
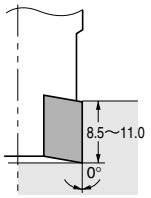
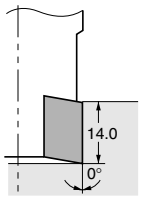
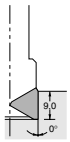
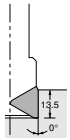
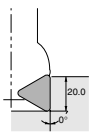
367～440

Product Lineup

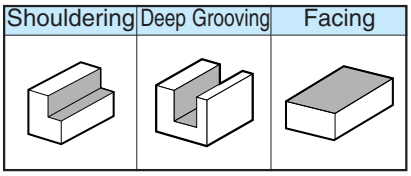
Shouldering	Grooving	Facing
		

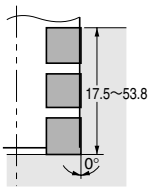
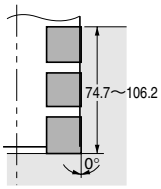
Appli-cation	Type	Corner Angle Max. a*p*	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Shouldering	**MEA** 【Hurricane Endmill】 P.380		 	Standard (Straight)	**MEA** **10-S10** **12-S10** **12-S16** **13-S12** **14-S12** **16-S12** **16-S16** **17-S16** **18-S16** **19-S16** **20-S16** **20-S20** **20-S20-Z2** **21-S20** **22-S20** **24-S20** **25-S20** **25-S25** **28-S25** **30-S25** **32-S25** **32-S32** **40-S32** **50-S32** **63-S32** **80-S32**	1 1 1 1 1 2 2 2 2 2 3 3 2 3 3 3 3 3 3 4 4 4 5 6 8 8	10 12 12 13 14 16 16 17 18 19 20 20 20 21 22 24 25 25 28 30 32 32 40 50 63 80	● Cutting Dia.: ϕ10～ϕ80 ● Edge Length: 9.0mm ● A.R.: +9° R.R.: –13°～–3° ● Low Cutting Force, Good Chip Evacuation ● High-Efficiency Machining of Steel and Cast Iron ● Chattering Prevention by Adopting the Nicked Insert ● Wide Product Lineup
			 	Standard (Weldon)	**MEA** **10-S10-W** **12-S12-W** **16-S12-W** **16-S16-W** **20-S16-W** **20-S20-W** **25-S20-W** **25-S25-W-4T** **32-S25-W** **32-S32-W-5T** **40-S32-110W-6T**	1 1 2 2 3 3 3 4 4 5 6	10 12 16 16 20 20 25 25 32 32 40	
				Long Shank (Straight)	**MEA** **20-S20-130** **25-S25-140** **32-S25-160** **40-S32-200**	2 3 4 4	20 25 32 40	
				Long Shank (Weldon)	**MEA** **20-S20-130W** **25-S25-140W** **32-S25-160W** **40-S32-200W**	2 3 4 4	20 25 32 40	
	MEB 【Hurricane Endmill】 P.380			Standard (Straight)	**MEB** **25-S20** **25-S25** **32-S25** **32-S32** **40-S32** **50-S32** **63-S32** **80-S32**	2 2 3 3 4 4 5 6	25 25 32 32 40 50 63 80	● Cutting Dia.: ϕ25～ϕ80 ● Edge Length: 15.0mm ● A.R.: +11° R.R.: –11°～–4° ● Low Cutting Force, Good Chip Evacuation ● High-Efficiency Machining of Steel and Cast Iron ● Chattering Prevention by Adopting the Nicked Insert
				Standard (Weldon)	**MEB** **25-S20-W** **25-S25-W** **25-S25-100W-2T** **32-S25-W** **32-S32-W** **32-S32-110W-3T** **40-S32-W** **40-S32-115W-4T**	2 2 2 3 3 3 4 4	25 25 25 32 32 32 40 40	

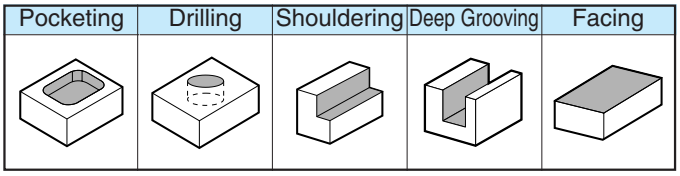
Shouldering	Grooving	Facing
		

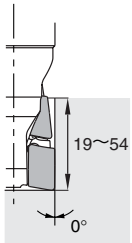
Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Shouldering	**MAP-SC** 【Hurricane Endmill】 P.384			Separate (Screw On)	**MAP** 025R10-SC 032R10-SC 040R10-SC	3 4 5	25 32 40	● Cutting Dia.: ϕ25～ϕ40 ● Edge Length: 10.0mm ● A.R.: +9° R.R.: –10°～–4° ● Separate Type (Milling Head + Adapter) ● High Efficiency for Steel & Cast Iron Machining
	DMC P.386			Standard	**DMC** 810-S16 811-S16 812-S16 813-S16 814-S16 815-S16 816-S16 818-S20 820-S20 822-S25 825-S25 **DMC** 810 812 **DMC** 014 016 020	1 1 1 1 1 1 2 2 3 3 3 1 1 1 1 2	10 11 12 13 14 15 16 18 20 22 25 10 12 14 16 20	● Cutting Dia.: ϕ10～ϕ25 ● Edge Length: 8.5～11.0mm ● A.R.: +3°～+8° R.R.: –11°～0° ● For Small Milling Machine M/C
	DMC-SX P.387			Standard	**DMC** 316SXT 320SX 325SX 332SX 340SX	1 1 2 2 2	16 20 25 32 40	● Cutting Dia.: ϕ16～ϕ40 ● Edge Length: 14.0mm ● A.R.: +3° R.R.: –3°～0° ● For Small Milling Machine M/C
				Long Shank	**DMC** 320SX-200 325SX-220 332SX-250	1 2 2	20 25 32	
	DMC-H P.388			High Rake	**DMC** 316H 320H 325H 332H 340H	1 1 2 2 2	16 20 25 32 40	● Cutting Dia.: ϕ16～ϕ40 ● Edge Length: 14.0mm ● A.R.: +5°～+8° R.R.: –3.5°～0° ● Low Cutting Force ● For Small Milling Machine, M/C
	MTPS P.389			Standard	**MTPS** 216 220	1 2	16 20	● Cutting Dia.: ϕ16, ϕ20 ● Edge Length: 9.0mm ● A.R.: +3°～+5° R.R.: –5°～–4° ● For Small Dia. Machining, Low Cutting Force type
	MTES P.389			Standard	**MTES** 325 330 335	2 2 3	25 30 35	● Cutting Dia.: ϕ25～ϕ35 ● Edge Length: 13.5mm ● A.R.: +11°～+15° R.R.: –2°～0° ● For Small Dia. Machining, Low Cutting Force type
	MEAL 【Hurricane Endmill】 P.390			Standard	**MEAL** 25-S25 50-S32	1 2	25 50	● Cutting Dia.: ϕ25, ϕ50 ● Edge Length: 20.0mm ● A.R.: +12° R.R.: –7°～–3.5° ● For Aluminum Alloy ● High Rake Insert ● With Air Hole

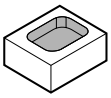
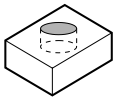
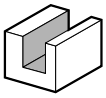
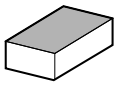
Product Lineup

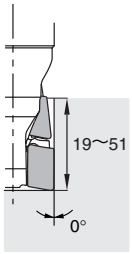
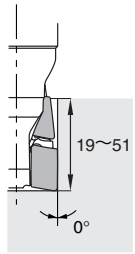
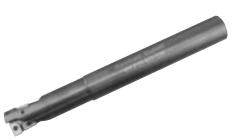


Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Edge Line	Cutting Edge Diameter (mm)	Features
Shouldering (Deep Grooving)	**MHD-SA** 【Plus Mill】 P.392			Separate A-type	**MHD 32-S32-SA**	10	2	32	● Cutting Dia.: ϕ20~ϕ50 ● Long Edge Length : 17.5~53.8mm ● A.A.: +9° R.R.: –7°~–1° ● Roughing of Mold ● Low Cutting Force ● Large Metal Removal Rate ● Adjustable Edge Length (Separate-type)
					40-S32-SA	10	2	40	
					40-S42-SA	10	2	40	
					50-S42-SA	10	2	50	
	MHD-SB 【Plus Mill】 P.392			Separate B-type	**MHD 40-S42-SB**	10	2	40	
					50-S42-SB	10	2	50	
	MHD-C 【Plus Mill】 P.393			Integral type	**MHD 20S-S20-C**	3	1	20	
					25-S25-C	8	2	25	
					32-S32-C	10	2	32	
					40-S42-C	10	2	40	
					50-S42-C	10	2	50	
	MHD-FMA-SA 【Plus Mill】 P.398			Separate (No Arbor)	**MHD 63-FMA-SA**	21	3	63	● Cutting Dia.: ϕ63~ϕ100 ● Long Edge Length : 74.7~106.2mm ● Roughing of Mold / Jig Machining ● Low Cutting Force ● Large Metal Removal Rate ● Adjustable Edge Length (Separate-type)
					80-FMA-SA	27	3	80	
					100-FMA-SA	40	4	100	
	MHD-BT50-SA 【Plus Mill】 P.398			Separate (With Arbor)	**MHD 63-BT50-SA**	21	3	63	
					80-BT50-SA	27	3	80	
					100-BT50-SA	40	4	100	

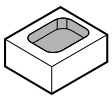


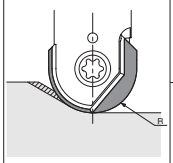
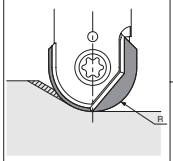
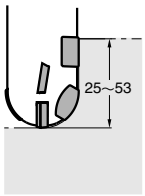
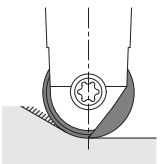
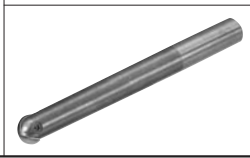
Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Edge Line	Cutting Edge Diameter (mm)	Features
Pocketing	**MEY** 【Ultra Drill Mill】 P.406			Standard	**MEY 16-S16**	4	2	16	● Cutting Dia.: ϕ16~ϕ50 ● Long Edge Length : 19.0~54.0mm ● A.R.: +9° R.R.: –5°~–2° ● 3-D Machining (Drilling/Ramping/ Shouldering/Grooving) ● High-Efficiency Machining of Mold ● Low Cutting Force, Good Chip Evacuation ● Full 2-Flute Structure and High Stability ● Good Chip Control at Ramping ● Wall Side Machining Available by Products of Cutting Dia.=Shank Dia. + 1mm
					17-S16	4	2	17	
					20-S20	4	2	20	
					21-S20	4	2	21	
					25-S25	4	2	25	
					26-S25	4	2	26	
					32-S32	4	2	32	
					33-S32	4	2	33	
					40-S32	7	2	40	
					50-S42	7	2	50	
				Long Head	**MEY 16-S16-140H**	4	2	16	
					20-S20-150H	4	2	20	
					25-S25-170H	4	2	25	
					32-S32-180H	4	2	32	
				Long Shank	**MEY 16-S16-190**	4	2	16	
					17-S16-190	4	2	17	
					20-S20-200	4	2	20	
					21-S20-200	4	2	21	
					25-S25-220	4	2	25	
					26-S25-220	4	2	26	
					32-S32-230	4	2	32	
					33-S32-230	4	2	33	
					40-S32-240	7	2	40	
					50-S42-250	7	2	50	

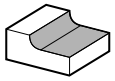
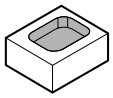
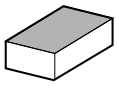
Pocketing	Drilling	Shouldering	Deep Grooving	Facing
				

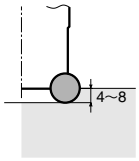
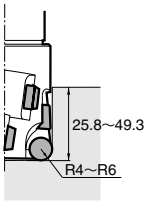
Appli-cation	Type	Corner Angle Max. a*p*	Shape	Category	Description	No. of Insert	Edge Line	Cutting Edge Diameter (mm)	Features
Pocketing	**MEZ-G** 【Drill Mill Silver】 P.410			Standard (Straight)	**MEZ 16-S16G**	4	2	16	● Cutting Dia.: ϕ16〜ϕ49 ● Long Edge Length : 16.0〜51.0mm ● A.R.: +9° R.R.: –5°〜–2° ● 3-D Machining (Drilling/Ramping/ Shouldering/Grooving) ● High-Efficiency Machining of Mold ● Low Cutting Force, Good Chip Evacuation ● Prevention of Body's Wearness from Chips by Silver Coating ● Prevention of Chip's Welding by Clearance Groove
					20-S20G	4	2	20	
					25-S25G	4	2	25	
					32-S32G	4	2	32	
					40-S32G	7	2	39	
					50-S42G	7	2	49	
				Standard (Weldon)	**MEZ 16-S16-120GW**	4	2	16	
					20-S20-130GW	4	2	20	
					25-S25-140GW	4	2	25	
					32-S32-150GW	4	2	32	
					40-S32-160GW	7	2	39	
					50-S40-170GW	7	2	49	
				Long Head (Straight)	**MEZ 16-S16-140HG**	4	2	16	
					20-S20-150HG	4	2	20	
					25-S25-170HG	4	2	25	
					32-S32-180HG	4	2	32	
				Long Shank (Straight)	**MEZ 16-S16-190G**	4	2	16	
					20-S20-200G	4	2	20	
					25-S25-220G	4	2	25	
					32-S32-230G	4	2	32	
					40-S32-240G	7	2	39	
					50-S42-250G	7	2	49	
				With Coolant Hole (Weldon)	**MEZ 16-S16-80GW-H**	4	2	16	
					20-S20-85GW-H	4	2	20	
					25-S25-95GW-H	4	2	25	
					32-S32-110GW-H	4	2	32	
	MEZ 【Drill Mill】 P.412			Standard (Straight)	**MEZ 16-S16**	4	2	16	● Cutting Dia.: ϕ16〜ϕ49 ● Long Edge Length : 16.0〜51.0mm ● A.R.: +9° R.R.: –5°〜–2° ● 3-D Machining (Drilling/Ramping/ Shouldering/Grooving) ● High-Efficiency Machining of Mold ● Low Cutting Force, Good Chip Evacuation
					20-S20	4	2	20	
					25-S25	4	2	25	
					32-S32	4	2	32	
					40-S32	7	2	39	
					50-S42	7	2	49	
				Standard (Weldon)	**MEZ 16-S16-W**	4	2	16	
					20-S20-W	4	2	20	
					25-S25-W	4	2	25	
					32-S32-W	4	2	32	
					40-S32-W	7	2	40	
					50-S42-W	7	2	50	
				Long Head (Straight)	**MEZ 16-S16-140H**	4	2	16	
					20-S20-150H	4	2	20	
					25-S25-170H	4	2	25	
					32-S32-180H	4	2	32	
				Long Shank (Straight)	**MEZ 16-S16-190**	4	2	16	
					20-S20-200	4	2	20	
					25-S25-220	4	2	25	
					32-S32-230	4	2	32	
					40-S32-240	7	2	39	
					50-S42-250	7	2	49	
				With Coolant Hole (Weldon)	**MEZ 16-S16-80W-H**	4	2	16	
					20-S20-85W-H	4	2	20	
					25-S25-95W-H	4	2	25	
					32-S32-110W-H	4	2	32	

Product Lineup

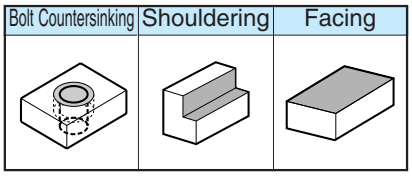
Contouring / Profiling	Pocketing
 Finishing	 Finishing

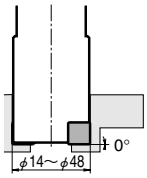
Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Mold Making	**MRF** 【Magic Ball】 P.416			Standard	**MRF** 08-S12 10-S12 12-S12 16-S20 20-S25 25-S32	1 1 1 1 1 1	8 10 12 16 20 25	● Cutting Dia.: ϕ8～ϕ25 ● Available to R4.0～R12.5 ● High Quality Finishing of Mold ● High R-Accuracy (Insert's R-Accuracy : under ±0.01mm) ● Insert's High Installation Accuracy by Magic Bush
				Long Neck	**MRF** 08-S12-130 10-S16-150 12-S16-160 16-S20-160 20-S25-180 25-S32-200	1 1 1 1 1 1	8 10 12 16 20 25	
	MRFW 【Magic Ball】 Carbide Shank P.416			Standard Neck	**MRFW** 08-S08 10-S10 12-S12	1 1 1	8 10 12	● Cutting Dia.: ϕ8～ϕ12 ● Available to R4.0～R6.0 ● High Quality Finishing of Mold ● High R-Accuracy (Insert's R-Accuracy : under ±0.01mm) ● Insert's High Installation Accuracy by Magic Bush ● Good Anti-Vibration Performance & Stable Machining even at Long Overhang
				Long Neck	**MRFW** 08-S08-130 10-S10-140 12-S12-150	1 1 1	8 10 12	
	MRZ P.418			Standard (Straight)	**MRZ** 30S-S32 30-S32 40-S42 50-S42	4 6 6 6	30 30 40 50	● Cutting Dia.: ϕ30～ϕ50 ● Edge Length : 25.0～53.0mm ● Profiling and Contouring of Mold ● Low Cutting Force and Good Chip Evacuation by Separate Edge Structure
				Standard (Weldon)	**MRZ** 30S-W32 30-W32 32-S32-W 40-S40-W	4 6 4 6	30 30 32 40	
				Standard (Combination)	**MRZ** 50-C508 50-S50.8-CS	6 6	50 50	
				Standard (MK)	**MRZ** 32-164-MK4 32-194-MK4 40-172-MK4 40-212-MK4 50-204-MK5 50-244-MK5	4 4 6 6 6 6	32 32 40 40 50 50	
				Long Shank	**MRZ** 30-S32-350 40-S42-350 50-C508-250	6 6 6	30 40 50	
	MHM 【CBN Ball-Nose】 P.421			Standard Neck	**MHM** 12Y1 16Y1 20Y1	2 2 2	12 16 20	● Cutting Dia.: ϕ12～ϕ20 ● Super Finishing for High Hardened Steel, Dies & Molds ● CBN Insert with High Precise Cutting Edge ● Anti-Vibration Shank (Solid Carbide) ● High Speed and Feed Rate
				Long Neck	**MHM** 12Y2 16Y2 20Y2	2 2 2	12 16 20	

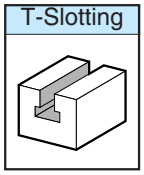
Curved Facing	Pocketing	Facing
		

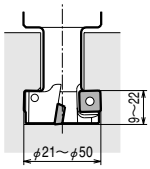
Appli-cation	Type	Coner Angle Max. a*p*	Shape	Category	Description	No. of Insert	Edge Line	Cutting Edge Diameter (mm)	Features
Curved Facing	**MRP** P.422			Standard (Straight)	**MRP 012-S16-08**	1	-	4	• Cutting Dia.: ϕ12~ϕ63 • Edge Length : 4.0~8.0mm • A.R.: +5° R.R.: –5°~–3° • High-Efficiency Machining of Mold • Available to Contouring, Helical Milling, Ramping, etc. • Firm Insert Fix by New Ratchet Design • Various Product Line for Small Dia., Multi-Edge, etc.
					016-S16-08	2		8	
					020-S20-08	2		12	
					MRP 025-S25-10-3T	3	-	15	
					032-S32-10-4T	4		22	
					MRP 032-S25-12	2	-	20	
					040-S32-12	3		28	
					040-S32-12-4T	4		28	
					050-S42-12	4		38	
					MRP 040-S32-16	2	-	24	
					050-S42-16	3		34	
					063-S42-16	4		47	
				Standard (Weldon)	**MRP 012-W16-1T042-90**	1	-	4	
					012-W16-1T042-130	1		4	
					016-W16-2T042-90	2		8	
					016-W20-2T042-132	2		8	
					016-W25-2T042-183	2		8	
					020-W20-2T042-92	2		12	
					020-W25-2T082-138	2		12	
					020-W25-2T082-183	2		12	
					MRP 025-W32-3T082-142	3	-	15	
					025-W32-3T127-187	3		15	
					032-W32-4T082-142	4		22	
					032-W32-4T127-187	4		22	
				Long Shank (Straight)	**MRP 012-S16-08-160**	1	-	4	
					016-S16-08-160	2		8	
					020-S20-08-180	2		12	
					MRP 025-S25-10-3T-180	3	-	15	
					032-S32-10-4T-200	4		22	
					MRP 032-S25-12-300	2	-	20	
					040-S32-12-300	3		28	
					040-S32-12-4T-200	4		28	
					050-S42-12-300	4		38	
					MRP 040-S32-16-300	2	-	24	
					050-S42-16-300	3		34	
					063-S42-16-300	4		47	
	MRP-SC 【Radius Endmill】 P.427			Separate (Screw On)	**MRP 025R-SC**	3	-	15	• Cutting Dia.: ϕ25~ϕ40 • Edge Length : 5.0~6.0mm • A.R.: +2~5° R.R.: –6~–5° • Separate Type (Milling Head + Adapter) • High Efficiency for Steel & Cast Iron Machining
					032R-SC	4		22	
					040R-SC	4		28	
	MHD-RSA 【Radius Plus Mill】 P.428			Separate A-type	**MHD 32-S32-4RSA**	10	2	24	• Cutting Dia.: ϕ20~ϕ50 • Long Edge Length : 25.8~49.3mm • A.R.: +9° R.R.: –7°~–1° • Radius-type of Plus Mill (Separate-type) is available to the conventional Plus Mill) • Roughing of Mold / Jig Machining • Helical Milling, Ramping
					40-S32-5RSA	10	2	30	
					40-S42-5RSA	10	2	30	
					50-S42-6RSA	10	2	38	
	MHD-RC 【Radius Plus Mill】 P.428			Integral type	**MHD 20-S20-4RC**	3	1	12	
					25S-S25-4RC	4	1	17	
					32-S32-5RC	10	2	22	
					40-S32-5RC	10	2	30	
					50-S42-6RC	10	2	38	

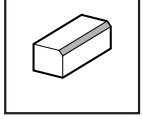
Product Lineup

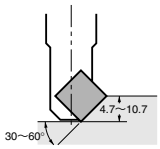


Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Bolt Countersinking	**MEF** P.432			Standard (Straight)	**MEF 14-S12**	1	14	• Cutting Dia.: φ14~φ48 (Min. Bore Dia. φ3.6~φ31.1) • A.R.: +5° R.R.: –13°~–12° • Countersink for Hexagon Socket Bolt (M8~M30) • High Efficiency Machining with Multi-Edge Design • Economical S-type Insert (4-corner use)
					17-S16	2	17.5	
					20-S16	3	20	
					23-S20	3	23	
					26-S25	3	26	
					29-S25	3	29	
					32-S25	3	32	
					35-S32	3	35	
					39-S32	4	39	
					43-S32	4	43	
					48-S32	4	48	
				Standard (Weldon)	**MEF 15-S12-80W**	1	15	
					18-S16-90W	2	18	
					20-S16-90W	3	20	
					26-S25-120W	3	26	
					33-S25-140W	3	32	
					40-S32-160W	4	40	

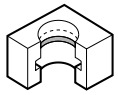


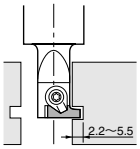
Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
T-Slotting	**METS** P.434			Standard	**METS 21-S25**	2	21	• Cutting Dia.: φ21~φ50 (Min. Bore Dia. φ3.6~φ31.1) • A.R.: +9° R.R.: –12°~–10° • For T-Slotting • Available for High Feed Machining with 2 Flute Design • Economical S-type Insert (4-corner use)
					25-S25	4	25	
					32-S32	4	32	
					40-S32	4	40	
					50-S32	4	50	
				With Air Hole	**METS 21-S25-H**	2	21	
					25-S25-H	4	25	
					32-S32-H	4	32	
					40-S32-H	4	40	
					50-S32-H	4	50	



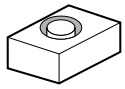
Appli-cation	Type	Corner Angle Max. a_p	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Chamfering	**MCSE** P.436			Chamfering Angle 45°	**MCSE 104**	1	4	• Cutting Dia.: φ4~φ36 • A.R.: +0° R.R.: –1°~+10° • For 30°, 45°, 60° Chamfering • Economical S-type Insert (4-corner use)
					106	1	6	
					115	1	15	
					227	2	27	
					336	3	36	
				Chamfering Angle 30°	**MCSE 104-30D**	1	4	
					108-30D	1	8	
					110-30D	1	10	
				Chamfering Angle 60°	**MCSE 108-60D**	1	8	
					120-60D	1	20	
				Chamfering Angle 45° (Weldon)	**MCSE 106-W**	1	6	
					115-W	1	15	
					227-W	2	27	
					336-W	3	36	

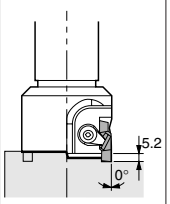
Internal Grooving



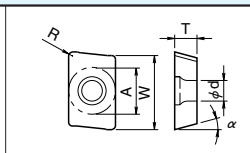
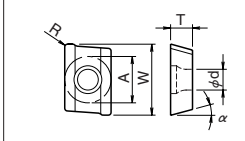
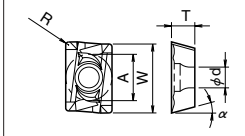
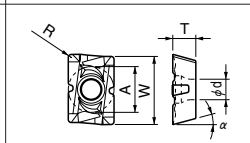
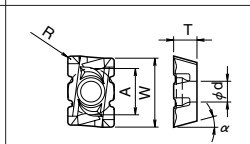
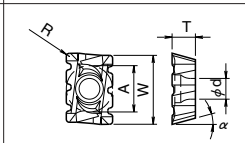
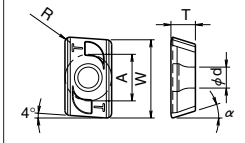
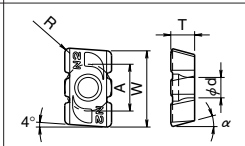
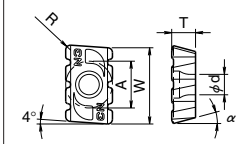
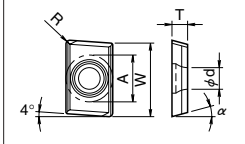
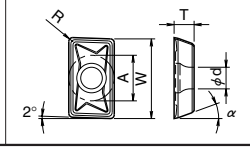
Appli-cation	Type	Corner Angle Max. a*p*	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Grooving for M/C	**MGI** P.438			Standard	**MGI 1420-1SS**	1	14	● Min. Bore Dia. : ϕ14~ϕ40 ● Edge Width: 1.0~4.0mm ● Grooving for M/C
					1620-1S	1	16	
					2020-1A	1	20	
					2220-1B	1	22	
					3225-1C	1	32	
					4025-1C	1	40	

Ring Grooving



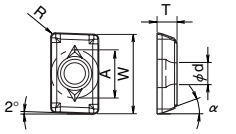
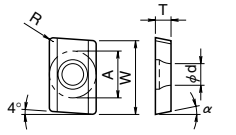
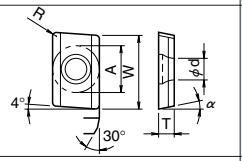
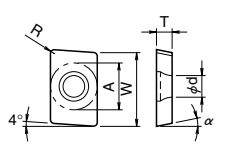
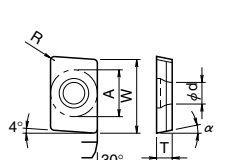
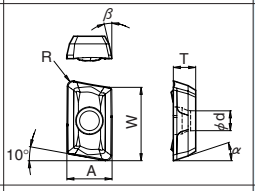
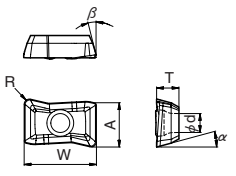
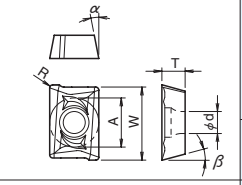
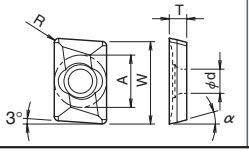
Appli-cation	Type	Corner Angle Max. a*p*	Shape	Category	Description	No. of Insert	Cutting Edge Diameter (mm)	Features
Ring Grooving	**MVG** P.440			Standard	**MVG 3032**	1	30	● Cutting Dia.: ϕ30~ϕ75 ● Edge Width: 4.0~4.9mm ● O-Ring Grooving (G Series)
					3532	1	35	
					4032	1	40	
					4532	1	45	
					5032	1	50	
					5532	1	55	
					6032	1	60	
					6532	1	65	
					7032	1	70	
					7532	1	75	

Endmilling Inserts

Shape	Description	Dimension (mm) A	T	φd	W	R	Angle (°) α	β	Insert Grade: Cermet TN100M	Cermet TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR915	PR930	Carbide KW10	Carbide PW30	Ref. Page for Toolholder
 	NDKW 090304ER	6.35	3.18	2.8	9.5	0.4	15°	-	○		○		○	○				●		380, 392 ~7, 428
	NDKW 150408ER 150408TR	10.00	4.76	4.4	15.9	0.8	15°	-	○		●		○	● ●				●		358 380
	150412ER					1.2							●							
 	NDKT 090304TR	6.35	3.18	2.8	9.5	0.4	15°	-						●						380
	NDKT 150408TR	10.0	4.76	4.4	15.9	0.8								●						358 380
 	NDKT 090304ER-V 090304TR-V	6.35	3.18	2.8	9.5	0.4	15°	-	●		●	○	● ●	● ●				●		380 392~7
	090308ER-V					0.8					●		●	●						428, 430
	NDKT 150408ER-V 150408TR-V	10.0	4.76	4.4	15.9	0.8			●		●	○	● ●	● ●			●	●		358 380
	150416ER-V					1.6							●							
 1-Nicked 	NDKT 090304ER-N1	6.35	3.18	2.8	9.5	0.4	15°	-	○		○	○	●	○				○		380 392~7 428 430
 2-Nicked 	NDKT 090304ER-N2	6.35	3.18	2.8	9.5	0.4	15°	-	○		●	○	●	●				●		
 3-Nicked 	NDKT 150408ER-N3	10.00	4.76	4.4	15.9	0.8	15°	-	○		○	○	○	○				○		358 380
 	NDMM 12T308ER-T	7.58	3.97	3.4	12.7	0.8	15°	-	●		●		●	●				●		392~7 428 430
 2-Nicked 	NDMM 12T308ER-N2	7.79	3.97	3.4	12.7	0.8	15°	-	●		●		●	●				●		359 392~401
 3-Nicked 	NDMM 12T308ER-N3	7.79	3.97	3.4	12.7	0.8	15°	-	●		●		●	●				●		428 430
 	NDMM 090204ER-SP	6.35	2.38	2.8	9.5	0.4	15°	-	○	○		○		○						
	NDMM 120204ER-SP 120208ER-SP	7.94	2.38	3.4	12.7	0.4 0.8	15°	-	○ ○	○ ○		○ ○		○ ○						386
	NDMM 150304ER-SP 150308ER-SP	9.525	3.18	4.4	15.0	0.4 0.8	15°	-	○ ●	○ ○		● ○		● ●						387 388
 	NDMT 080208ER-D	5.086	2.38	2.2	8.5	0.8	15°	-	○		●	○	●	●				●		410
	10T208ER-D	6.276	2.78	2.8	10.2				○		●	○	●	●				●		412
	NEMT 120308ER-D	7.669	3.18	3.4	12.7	0.8	20°	-	○		●	○	●	●				●		410
	16T308ER-D	9.254	3.97	4.4	16.2				○		●	○	●	●				●		412 418

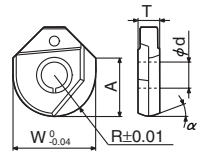
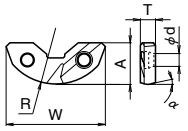
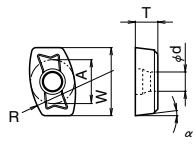
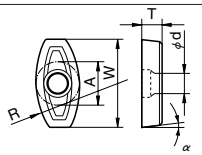
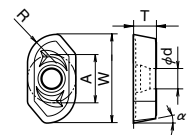
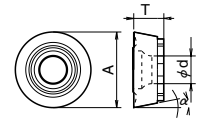
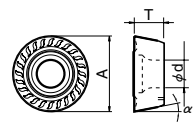
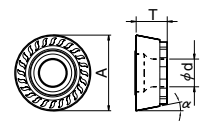
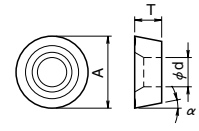
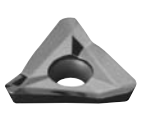
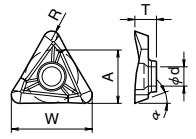
● : Std. Stock ○ : Check Availability

Endmilling Inserts

Shape	Description	Dimension (mm)					Angle (°)		Insert Grade												Ref. Page for Toolholder
									Cermet		PVD Coated									Carbide		
		A	T	φd	W	R	α	β	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR915	PR930	KW10	PW30	
NEW  Tough Edge 	NDMT 080208ER-DH	5.086	2.38	2.2	8.5	0.8	15°	-	○		●		●	●				●		410
	NDMT 10T208ER-DH	6.276	2.78	2.8	10.2				○		●		●	●				●		412
	NEMT 120308ER-DH	7.669	3.18	3.4	12.7	0.8	20°	-	○		●		●	●				●		410 412
	NEMT 16T308ER-DH	9.254	3.97	4.4	16.2				○		●		●	●				●		418
 	NDCT 090204TR	6.35	2.38	2.8	9.5	0.4	15°	-	○	○								●		386
	NDCT 090204FR																			
	NDCT 120208TR	7.94	2.38	3.4	12.7	0.8	15°	-	○	○								○		
	NDCT 120208FR																			
	NDCT 150308TR	9.525	3.18	4.5	15.0	0.8	15°	-	○	○		○		○				○		387
	NDCT 150308FR																			
 	NDCT 150308TRX	9.525	3.18	4.4	15.0	0.8	15°	-	○	○										388
 	NDCW 150302TR	9.525	3.18	4.5	15.0	0.2	15°	-	○	○										387
	NDCW 150304TR					0.4			○	○		●		●						
	NDCW 150308TR					0.8			○	○		●		●						
	NDCW 150320TR					2.0			○	○										
	NDCW 150330TR					3.0			○	○										
	NDCW 150340TR					4.0			○	○										
 	NDCW 150302TRX	9.525	3.18	4.4	15.0	0.2	15°	-	●											388
	NDCW 150304TRX					0.4			●											
	NDCW 150308TRX					0.8			●	○										
	NDCW 150308FRX					0.8												●		
	NDCW 150320TRX					2.0			●											
	NDCW 150330TRX					3.0			●	●										
	NDCW 150340TRX					4.0			●											
NEW  	JOMT 08T208ER-D	5.14	2.78	2.3	8.5	0.8	17°	13°							○					406
	JOMT 100308ER-D	6.42	3.18	2.8	10.2										○					
	JOMT 13T308ER-D	8.05	3.70	3.4	13.2										○					
	JOMT 160408ER-D	9.67	4.76	4.4	16.7										○					
NEW  	GOMT 08T208ER-D	5.14	2.78	2.3	8.7	0.8	13°	17°							○					406
	GOMT 100308ER-D	6.56	3.30	2.8	10.7										○					
	GOMT 13T308ER-D	8.36	3.85	3.4	13.2										○					
	GOMT 160408ER-D	10.03	4.76	4.4	16.7										○					
 	APKT 1003PDER-V	6.72	3.18	2.8	10.0	0.4	11°	15°	●		●			●			●		●	384
	APKT 100308PDER-V					0.8					●			●			●			
	APKT 1604PDER-V	9.525	4.76	4.4	16.0	0.8			●		●			●			●		●	–
 	ADMM 15T308	9.525	3.97	4.0	15.0	0.8	15°	-		●			●							–

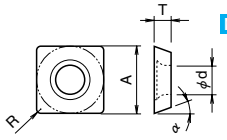
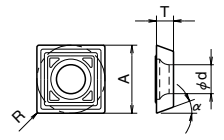
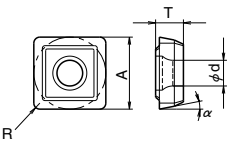
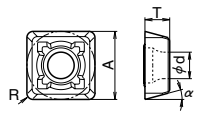
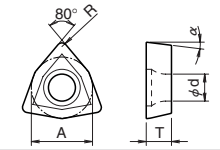
● : Std. Stock ○ : Check Availability

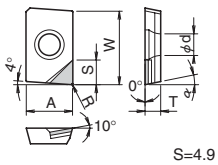
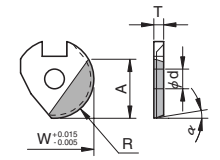
Endmilling Inserts

Shape	Description	Dimension (mm) A	T	φd	W	R	Angle (°) α	β	Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR915	PR930	Carbide KW10	PW30	Ref. Page of Toolholder
NEW 		**RDFG 08FR**	6.6	2.1	3.1	8.0	4	15°	-								●				416
		10FR	8.0	2.7	3.6	10.0	5	15°									●				
		12FR	9.4	3.2	4.1	12.0	6	15°									●				
		16FR	11.3	4.2	5.1	16.0	8	10°									●				
		20FR	14.1	5.2	6.1	20.0	10	10°									●				
		25FR	15.5	6.2	6.1	25.0	12.5	10°									●				
		**RCGT 30ER**	11.5	5.0	3.4	26.6	15	7°	-				●	●				●			418
		32ER	11.5	5.0	3.4	27.6	16							●							
		40ER	14.0	6.0	4.4	34.6	20						●	○				●			
		50ER	15.0	7.0	4.4	41.3	25						●	○				○			
		**YCMT 30T3ER**	7.74	3.97	3.4	12.0	15	7°	-				●	●				●			418
		32T3ER	7.94	3.97	3.4	13.2	16							●							
		4004ER	9.88	4.76	4.4	18.0	20						●	○				●			
		5005ER	11.90	5.56	5.5	24.0	25						●	○				○			
 Tough Edge		**YCMT 5005ER-H**	11.90	5.56	5.5	24.0	25	7°	-					○	○				○		418
		**FPMT 090340ER**	6.64	3.18	2.8	9.2	4	11°	-		●		●	○				○			428~430
		**RPMT 10T3M0**	10.0	3.97	3.4	–	–	11°	-	●		●		●	●			○		361 422 427~430
		RPMT 1204M0	12.0	4.76	4.4	–	–	11°	-			●		●	●			○		
NEW  Tough Edge		**RDMT 08T2M0-H**	8.0	2.78	3.4	–	–	15°	-	●		●		○	●			○		422
 Tough Edge		**RPMT 1204M0-H**	12.0	4.76	4.4	–	–	11°	-	●		●		●	●			○		361,422 427~430
		RPMT 1606M0-H	16.0	6.35	5.5	–	–	11°	-	●		●		●	●			○		361 422
		RPMT 2006M0-H	20.0	6.35	6.5	–	–	11°	-			○		○	○			○		361
		**RPMT 120400**	12.70	4.76	5.16	–	–	11°	-					○	○					-
		**TEMT 250624-AQ**	15.875	6.35	5.5	23.0	2.4	20°	-									●		391

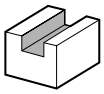
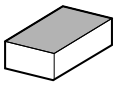
● : Std. Stock ○ : Check Availability

■ Endmilling Insert

Shape	Description	Dimension (mm)					Angle (°)		Insert Grade											Ref. Page for Toolholder
									Cermet		PVD Coated							Carbide		
		A	T	ϕd	W	R	α	β	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR915	PR930	KW10	PW30	
		NEW SDKW 09T204TN 09T204FN	9.525	2.78	3.4	–	0.4	15°	-	●					●				●	436
		SEKW 120304TN 120304FN	12.70	3.18	5.5	–	0.4	20°	-	●	○		○		●				●	
		120308TN 120308FN	12.70	3.18	5.5	–	0.8	20°	-	●	○		○		●				●	
NEW  Low Cutting Force		SDMT 09T204C	9.525	2.78	3.4	–	0.4	15°	-	●					●				●	
		SEMT 120304C	12.70	3.18	5.5	–	0.4	20°	-						●				●	
		SPMT 060204E-Z 090308E-Z	6.35 9.525	2.38 3.18	2.5 3.4	– –	0.4 0.8	11°	-			● ●		○ ○	● ●				● ○		432
		SDMT 060304E-K 080308E-K 120408E-K	6.35 8.00 12.70	3.18 3.18 4.76	2.8 3.4 4.4	– – –	0.4 0.8 0.8	15°	-			○ ○ ●		○ ○ ●	● ● ●				○ ○ ○		434
		WCMT 050308	7.94	3.18	3.2	–	0.8	7°	-			●		●						-
		WCMT 06T308	9.525	3.97	3.7	–	0.8					●		●						

Shape	Description	Dimension (mm)					Angle (°)		Insert Grade										Ref. Page of Toolholder
									CBN						Diamond				
		A	T	ϕd	W	R	α	β	KBN10B	KBN25B	KBN65B	KBN900	KBN22Y	KBN62Y	KPD025	KPD010	KPD002	KPD001	
		NDCW 150302FRX	9.525	3.18	4.4	15.0	0.2	15°	-						○	○		○	388
		RY 1200 1600 2000	9.0 12.0 14.0	1.8 2.0 2.5	3.5 4.0 5.0	12.0 16.0 20.0	6 8 10	8°	-				● ● ●	● ● ●					421

Endmilling [ND□□ Insert] Hurricane Endmill

Shouldering	Grooving	Facing
		

■ MEA / MEB

Standard (Straight)

● Standard type

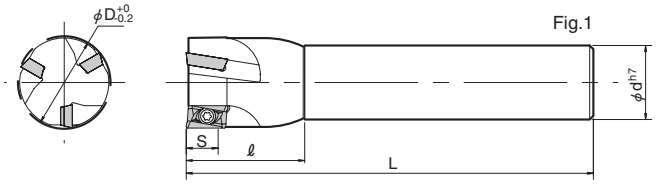


Fig.1

Standard (Weldon)

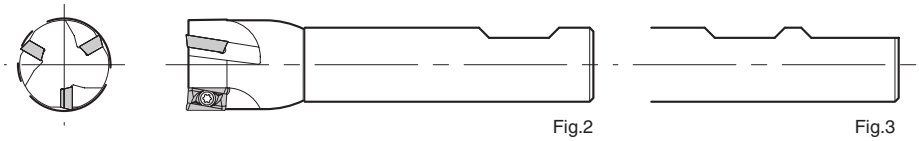


Fig.2 Fig.3

● Same Shank Size-type

Same Shank Size (Straight)

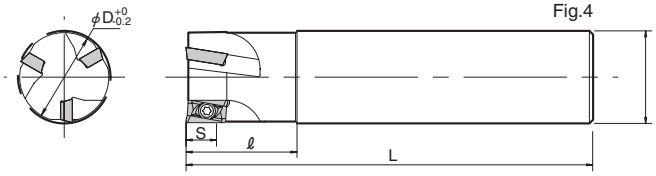


Fig.4

Same Shank Size (Weldon)

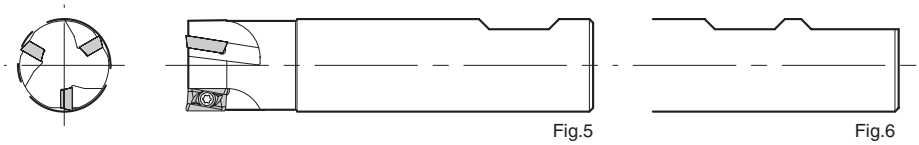


Fig.5 Fig.6

● Long Shank type

Long Shank (Straight)

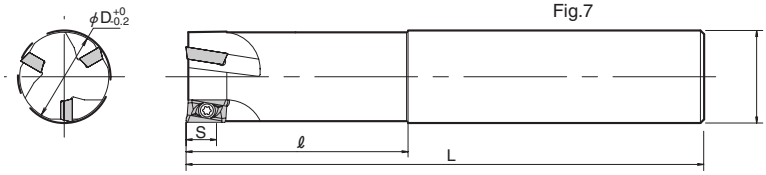


Fig.7

Long Shank (Weldon)

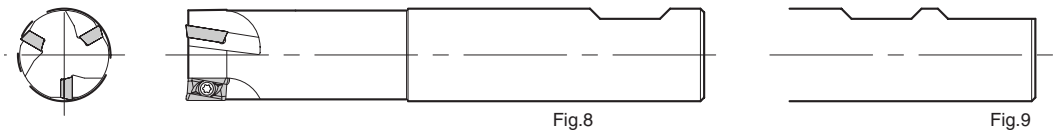


Fig.8 Fig.9

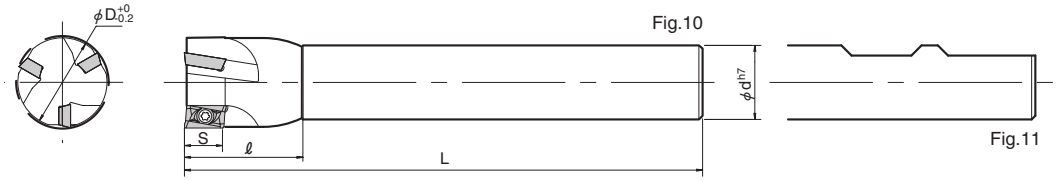


Fig.10 Fig.11

● : Std. Stock ○ : Check Availability

● Toolholder Dimension **(MEA)** Edge Length : S=9.0mm

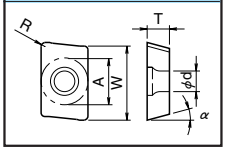
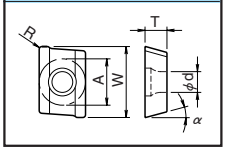
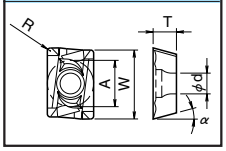
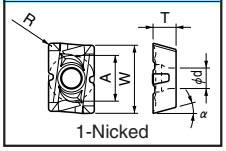
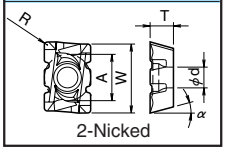
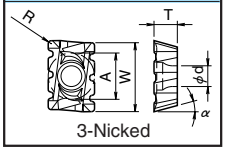
Description		Stock	No. of Insert	Dimension (mm)					Rake Angle (°)		Shape	Spare Parts		Applicable Insert
				ϕD	ϕd	L	ℓ	S	A.R.	R.R.		Clamp Screw	Wrench	
Standard (Straight)	MEA 12-S10	○	1	12	10	80	20	9.0	+9°	-24°	Fig.1	SB-2560TR	DT-8	NDKW09 NDKT09
	12-S16	○	1	12	16	80	27			-24°				
	13-S12	○	1	13	12	80	20			-22°				
	14-S12	○	1	14	12	80	20			-21°				
	16-S12	○	2	16	12	90	23			-14°				
	17-S16	○	2	17	16	90	23			-13°				
	18-S16	○	2	18	16	90	23			-12°				
	19-S16	○	2	19	16	110	26			-11°				
	20-S16	○	3	20	16	110	26			-13°				
	21-S20	○	3	21	20	110	26			-12°				
	22-S20	●	3	22	20	110	26			-12°				
	24-S20	○	3	24	20	110	29			-11°				
	25-S20	○	3	25	20	110	29			-10°				
	28-S25	●	3	28	25	110	29			-10°				
	30-S25	○	4	30	25	130	32			-7°				
	32-S25	○	4	32	25	130	32			-4°				
	40-S32	●	5	40	32	130	32			-3°				
	50-S32	○	6	50	32	130	35			-3°				
	63-S32	○	8	63	32	130	35			-3°				
	80-S32	○	8	80	32	130	35			-3°				
Standard (Weldon)	MEA 16-S12-W	●	2	16	12	90	23	9.0	+9°	-14°	Fig.2	SB-2560TR	DT-8	NDKW09 NDKT09
	20-S16-W	●	3	20	16	110	26			-13°				
	25-S20-W	●	3	25	20	110	29			-10°	Fig.3			
	32-S25-W	●	4	32	25	130	32			-4°				
	40-S32-110W-6T	●	6	40	32	110	32			-3°				
Same Shank Size (Straight)	MEA 10-S10	○	1	10	10	80	17	9.0	+4°	-31°	Fig.4	SB-2560TR	DT-8	NDKW09 NDKT09
	16-S16	○	2	16	16	90	30		+9°	-14°				
	20-S20	○	3	20	20	110	30			-13°				
	20-S20-Z2	○	2	20	20	110	30			-13°				
	25-S25	○	3	25	25	110	30			-10°				
	32-S32	○	4	32	32	130	40			-4°				
Same Shank Size (Weldon)	MEA 10-S10-W	●	1	10	10	80	17	9.0	+4°	-31°	Fig.5	SB-2560TR	DT-8	NDKW09 NDKT09
	12-S12-W	●	1	12	12	80	20		+9°	-24°				
	16-S16-W	●	2	16	16	90	30			-14°				
	20-S20-W	●	3	20	20	110	30			-13°				
	25-S25-W-4T	●	4	25	25	90	30			-10°	Fig.6			
	32-S32-W-5T	●	5	32	32	100	40			-4°				
Long Shank (Straight)	MEA 20-S20-130	○	2	20	20	130	60	9.0	+9°	-13°	Fig.7	SB-2560TR	DT-8	NDKW09 NDKT09
	25-S25-140	○	3	25	25	140	60			-10°				
	32-S25-160	○	4	32	25	160	32			-4°	Fig.10			
	40-S32-200	○	4	40	32	200	32			-3°				
Long Shank (Weldon)	MEA 20-S20-130W	●	2	20	20	130	60	9.0	+9°	-13°	Fig.8	SB-2560TR	DT-8	NDKW09 NDKT09
	25-S25-140W	●	3	25	25	140	60			-10°	Fig.9			
	32-S25-160W	●	4	32	25	160	32			-4°	Fig.11			
	40-S32-200W	●	4	40	32	200	32			-3°				

● Toolholder Dimension **(MEB)** Edge Length : S=15.0mm

Description		Stock	No. of Insert	Dimension (mm)					Rake Angle (°)		Shape	Spare Parts		Applicable Insert
				ϕD	ϕd	L	ℓ	S	A.R.	R.R.		Clamp Screw	Wrench	
Standard (Straight)	MEB 25-S20	○	2	25	20	120	36	15.0	+11°	-11°	Fig.1	SB-4085TR	DT-15	NDKW15 NDKT15
	32-S25	○	3	32	25	120	40			-9°				
	40-S32	○	4	40	32	150	45			-7°				
	50-S32	○	4	50	32	150	45			-6°				
	63-S32	○	5	63	32	150	45			-5°				
	80-S32	○	6	80	32	150	45			-4°				
Standard (Weldon)	MEB 25-S20-W	●	2	25	20	120	36	15.0	+11°	-11°	Fig.3	SB-4085TR	DT-15	NDKW15 NDKT15
	32-S25-W	●	3	32	25	120	40			-9°				
	40-S32-W	●	4	40	32	150	45			-7°				
	40-S32-115W-4T	●	4	40	32	115	45							
Same Shank Size (Straight)	MEB 25-S25	○	2	25	25	120	36	15.0	+11°	-11°	Fig.4	SB-4085TR	DT-15	NDKW15 NDKT15
	32-S32	○	3	32	32	120	40			-9°				
Same Shank Size (Weldon)	MEB 25-S25-W	●	2	25	25	120	36	15.0	+11°	-11°	Fig.6	SB-4085TR	DT-15	NDKW15 NDKT15
	25-S25-100W-2T	●	2	25	25	100	36							
	32-S32-W	●	3	32	32	120	40			-9°				
	32-S32-110W-3T	●	3	32	32	110	40							

● : Std. Stock ○ : Check Availability

● Applicable Insert

NDKW...(E/T)R	NDKT...TR	NDKT...(E/T)R-V	NDKT...ER-N1	NDKT...ER-N2	NDKT...ER-N3
			 1-Nicked	 2-Nicked	 3-Nicked

Description		Dimension (mm)						Angle (°)		Insert Grade													
										Cermet		PVD Coated						Carbide		Diamond			
		A	T	ϕd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDKW	090304ER	6.35	3.18	2.8	9.5	0.4		15°		○		○		○	○			●					
NDKT	090304TR	6.35	3.18	2.8	9.5	0.4		15°							●								
NDKT	090304ER-V	6.35	3.18	2.8	9.5	0.4		15°		●		●	○	●	●			●					
	090304TR-V													●	●								
	090308ER-V					0.8						●		●	●								
NDKT	090304ER-N1	6.35	3.18	2.8	9.5	0.4		15°		○		○	○	●	○			○					
NDKT	090304ER-N2	6.35	3.18	2.8	9.5	0.4		15°		○		●	○	●	●			●					
NDKW	150408ER	10.00	4.76	4.4	15.9	0.8		15°		○		●		○	●			●					
	150408TR														●								
	150412ER					1.2								●									
NDKT	150408TR	10.00	4.76	4.4	15.9	0.8		15°							●								
NDKT	150408ER-V	10.00	4.76	4.4	15.9	0.8		15°		●		●	○	●	●			●					
	150408TR-V													●	●		●						
	150416ER-V					1.6								●									
NDKT	150408ER-N3	10.00	4.76	4.4	15.9	0.8		15°		○		○	○	○	○			○					

IMPORTANT: See P. 402-403 for Nicked Insert's installation

◆ Recommended Cutting Conditions **(MEA)**

Work Material	f (mm/tooth)		Recommended Grade (V_C Speed: m/min)										Max. ap (mm)		
			Cermet		PVD Coated						Carbide				
	ϕD ϕ12~ϕ20	ϕD ϕ21~ϕ80	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	Cutting Dia. (ϕD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	0.03~0.08	0.07~0.15	☆ 120~200			☆ 120~200	★ 100~200	☆ 120~200					~ϕ14	1	8×1
													ϕ16~ϕ28	3	8×3
													ϕ30~ϕ80	2	8×5
Carbon Steel (SXXC)	0.03~0.12	0.07~0.15	★ 120~200			☆ 120~200	☆ 100~180	★ 120~200					~ϕ14	1.5	8×2
													ϕ16~ϕ28	6	8×6
													ϕ30~ϕ80	3	8×10
Alloy Steel (SCM, etc.)	0.03~0.12	0.07~0.15	★ 100~180			☆ 100~180	☆ 80~150	★ 100~180					~ϕ14	1.5	8×2
													ϕ16~ϕ28	5	8×5
													ϕ30~ϕ80	3	8×10
Metal Mold Steel (SKD/NAK, etc.)	0.03~0.1	0.07~0.15	★ 100~180			☆ 80~150	☆ 60~130	★ 80~150					~ϕ14	1.5	8×2
													ϕ16~ϕ28	4	8×4
													ϕ30~ϕ80	3	8×10
Cast Iron (FC/FCD, etc.)	0.05~0.15	0.1~0.2			★ 80~180						☆ 80~150		~ϕ14	1.5	8×2
													ϕ16~ϕ28	6	8×6
													ϕ30~ϕ80	4	8×10
Non-ferrous Metal (Aluminum, etc.)	0.05~0.2	0.1~0.25									★ 100~300		~ϕ14	3	8×3
													ϕ16~ϕ28	6	8×10
													ϕ30~ϕ80	4	8×20

· Reduce the ap by 20-50% at the machining with long overhang length or using long shank type

★: 1st Recommendation ☆: 2nd Recommendation

◆ Recommended Cutting Conditions **(MEB)**

Work Material	f (mm/tooth)	Recommended Grade (V_C Speed: m/min)										Max. ap (mm)		
		Cermet		PVD Coated						Carbide				
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	Cutting Dia. (ϕD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	~0.2	☆ 120~200			☆ 120~200	★ 100~200	☆ 120~200					ϕ25	2	14×3
												ϕ32, ϕ40	3	14×5
												ϕ50~ϕ80	–	14×10
Carbon Steel (SXXC)	~0.25	★ 120~200			☆ 120~200	☆ 100~180	★ 120~200					ϕ25	5	14×7
												ϕ32, ϕ40	5	14×10
												ϕ50~ϕ80	–	14×20
Alloy Steel (SCM, etc.)	~0.25	★ 100~180			☆ 100~180	☆ 80~150	★ 100~180					ϕ25	4	14×6
												ϕ32, ϕ40	5	14×8
												ϕ50~ϕ80	–	14×15
Metal Mold Steel (SKD/NAK, etc.)	~0.2	★ 100~180			☆ 80~150	☆ 60~130	★ 80~150					ϕ25	4	14×6
												ϕ32, ϕ40	5	14×8
												ϕ50~ϕ80	–	14×15
Cast Iron (FC/FCD, etc.)	~0.25			★ 80~180						☆ 80~150		ϕ25	6	14×8
												ϕ32, ϕ40	5	14×12
												ϕ50~ϕ80	–	14×20
Non-ferrous Metal (Aluminum, etc.)	~0.2									★ 100~300		ϕ25	7	14×10
												ϕ32, ϕ40	5	14×15
												ϕ50~ϕ80	–	14×30

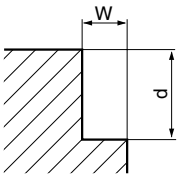
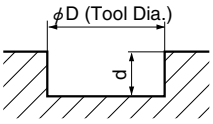
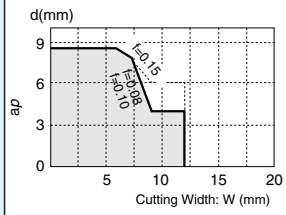
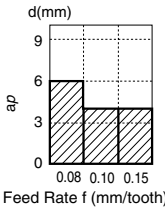
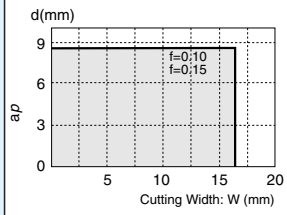
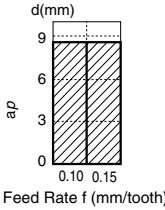
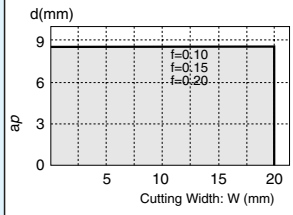
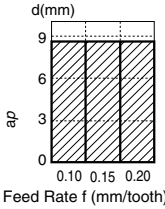
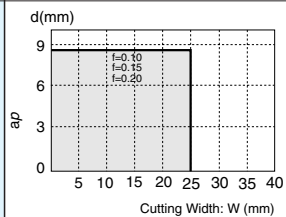
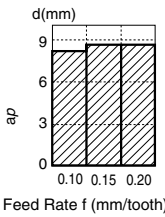
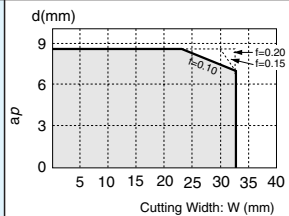
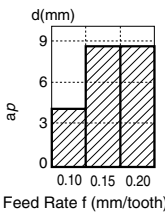
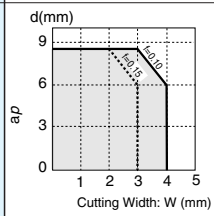
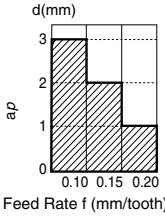
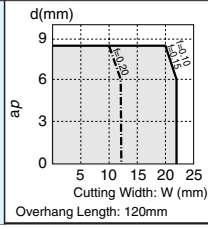
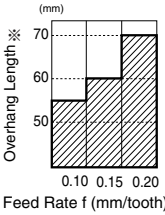
· Grooving using the tool over ϕ50 mm is not recommended.

★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

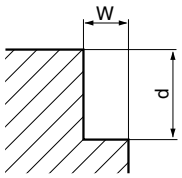
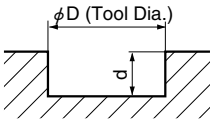
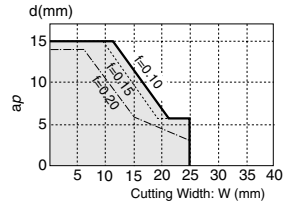
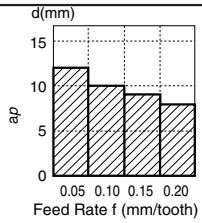
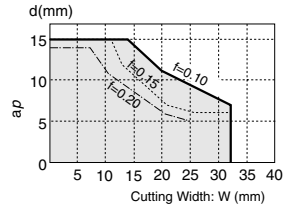
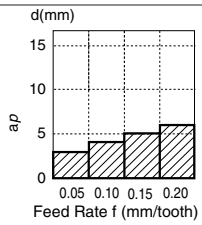
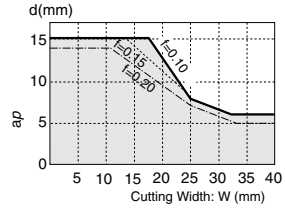
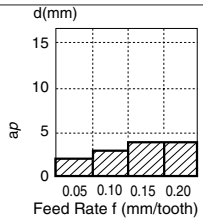
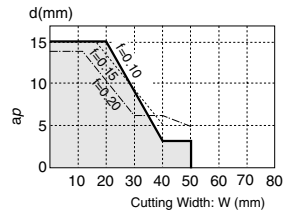
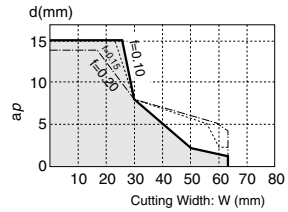
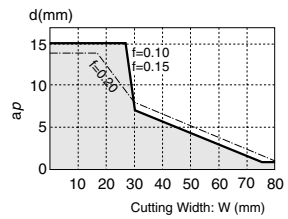
◆ Cutting Performance of MEA

Cutting Conditions Cutting Speed: V_C=100m/min, Overhang Length: Same as "ℓ" in the Dimension Chart
Insert: NDKT090304ER-V (PR660), Coolant: Dry

Work Material	Shouldering	Grooving
S50C (Overhang Length: 20mm)		
Description		
MEA12-S10 (Overhang Length: 20mm)		
MEA16-S10 (Overhang Length: 23mm)		
MEA20-S16 (Overhang Length: 26mm)		
MEA25-S20 (Overhang Length: 29mm)		
MEA32-S25 (Overhang Length: 32mm)		
MEA40-S20-130 (Overhang Length: 60mm)		
MEA40-S32-200		

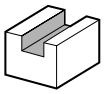
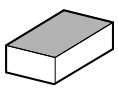
◆ Cutting Performance of MEB

Cutting Conditions Cutting Speed: V_C=100m/min, Overhang Length: Same as "ℓ" in the Dimension Chart
Insert: NDKT150408ER-V (PR660), Coolant: Dry

Work Material	Shouldering	Grooving
S50C (Overhang Length: 20mm)		
Description		
MEB25-S20 (Overhang Length: 36mm)		
MEB32-S25 (Overhang Length: 40mm)		
MEB40-S32 (Overhang Length: 45mm)		
MEB50-S32 (Overhang Length: 45mm)		Not Recommended to Grooving
MEB63-S32 (Overhang Length: 45mm)		Not Recommended to Grooving
MEB80-S32 (Overhang Length: 45mm)		Not Recommended to Grooving

* In this case only, *ap* is fixed at 3mm and overhang length is changed.

Endmilling [APKT Insert] Screw-On type

Shouldering	Grooving	Facing
		

■ MAP

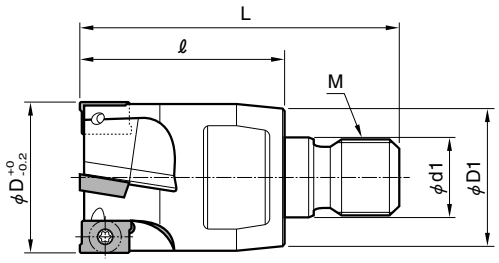


Fig.1

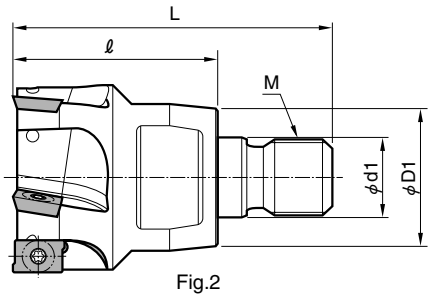


Fig.2

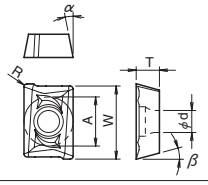
● Toolholder Dimension

Applicable Adapter ➡ P.385

Description	Stock	No. of Insert	Dimension (mm) φD	φD1	φd1	L	ℓ	M	S	Rake Angle (°) A.R.	R.R.	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Applicable Insert
MAP 025R10-SC	●	3	25	21	12.5	57	35	M12	10.0	+9°	-10°	Fig.1	**SB-2560TR**	**DT-8**	APKT1003PDER-V APKT100308PDER-V
032R10-SC	●	4	32	21	17.0	67	43	M16			-4°				
040R10-SC	●	5	40	29	17.0	67	43	M16			-4°	Fig.2			

● Applicable Insert

APKT...ER-V



Description	Dimension (mm) A	T	φd	W	R		Angle (°) α	β	Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
APKT 1003PDER-V	6.72	3.18	2.8	10.0	0.4		11°	15°	●		●			●		●		●				
100308PDER-V	6.72	3.18	2.8	10.0	0.8		11°	15°			●			●		●						

◆ Recommended Cutting Conditions

Work Material	f (mm/tooth)	Recommended Grade (V_C: m/min) Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Max. ap (mm) Cutting Dia. (φD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	0.07~0.15	☆ 120~200					★ 120~200		☆ 120~200		☆ 80~150	φ25	3	8×3
												φ32,φ40	2	8×5
Carbon Steel (SXXC)	0.07~0.15	☆ 120~200					★ 120~200		☆ 120~200		☆ 80~150	φ25	6	8×6
												φ32,φ40	3	8×10
Alloy Steel (SCM, etc.)	0.07~0.15	☆ 100~180					★ 100~180		☆ 100~180		☆ 80~150	φ25	5	8×5
												φ32,φ40	3	8×10
Metal Mold Steel (SKD/NAK, etc.)	0.07~0.15	☆ 100~180					★ 80~150		☆ 80~150		☆ 80~150	φ25	4	8×4
												φ32,φ40	3	8×10
Cast Iron (FC/FCD, etc.)	0.10~0.20			★ 80~180								φ25	6	8×6
												φ32,φ40	4	8×10
Non-ferrous Metal (Aluminum, etc.)	0.10~0.20											φ25	6	8×10
												φ32,φ40	4	8×20

★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

Adapter

■ AD

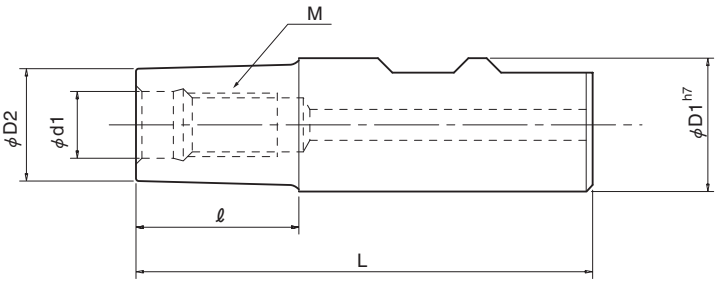


Fig.1

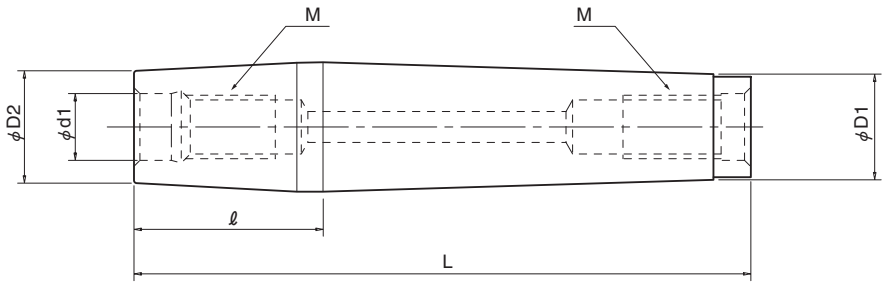


Fig.2

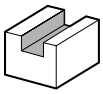
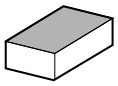
● Toolholder Dimension

Description	Stock	Dimension (mm)							Shank	Shape	Applicable Endmill	
											General Endmill Head	Radius Endmill Head
		φD	φD1	φd1	L	ℓ	M1	M2			MAP-SC ➡ P.384	MRP-SC ➡ P.427
AD 21-W25	●	25	21	12.5	87	31	M12	-	W25	Fig1	MAP025R10-SC	MRP025R-SC
29-W32	●	32	29	17.0	121	61	M16	-	W32		MAP032R10-SC / MAP040R10-SC	MRP032R-SC / MRP040R-SC
29-W40	●	40	29	17.0	192	122	M16	-	W40		MAP032R10-SC / MAP040R10-SC	MRP032R-SC / MRP040R-SC
AD 21-MK3	●	20	21	12.5	117	36	M12	M12	MK3	Fig2	MAP025R10-SC	MRP025R-SC
29-MK4	●	26	29	17.0	170	68	M16	M16	MK4		MAP032R10-SC / MAP040R10-SC	MRP032R-SC / MRP040R-SC
29-MK5	●	38	29	17.0	258	129	M16	M20	MK5		MAP032R10-SC / MAP040R10-SC	MRP032R-SC / MRP040R-SC

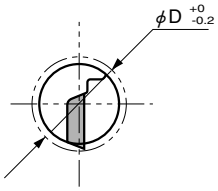
Combination of
MAP025R10-SC & AD21-W25

Combination of
MAP025R10-SC & AD-MK3

Endmilling [ND□□ 09/12 Insert]

Shouldering	Grooving	Facing
		

■ DMC



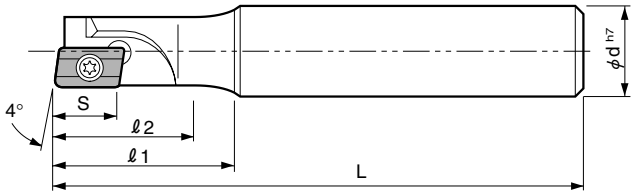


Fig.1

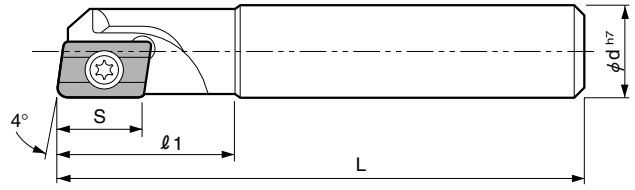
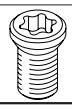
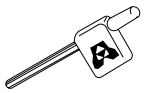


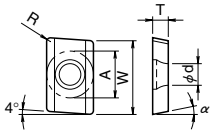
Fig.2

● Toolholder Dimension

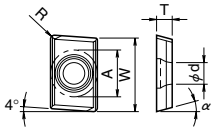
Description	Stock	No. of Insert	Dimension (mm)						Rake Angle (°)		Shape	Spare Parts		
												Clamp Screw	Wrench	
			ϕD	ϕd	L	ℓ1	ℓ2	S	A.R.	R.R.				
DMC 810-S16	○	1	10	16	90	27	16	8.5	+3°	-11°	Fig.1	**SB-2545TR**	**FT-8**	
811-S16	○	1	11	16	90	27	16		+3°	-10°				
812-S16	●	1	12	16	90	31	20		+5°	-10°				
813-S16	○	1	13	16	90	28.5	20		+5°	-9°				
814-S16	○	1	14	16	100	33.5	25		+6°	-8°				
815-S16	○	1	15	16	100	33.5	25		+6°	-8°				
816-S16	●	2	16	16	100	31	25		+6°	-4°				
818-S20	○	2	18	20	100	31	25		+6°	-3°				
820-S20	○	3	20	20	120	36	30		+8°	-6°				
822-S25	○	3	22	25	120	36	30		+8°	-5°				
825-S25	○	3	25	25	120	46	40		+8°	-5°				
DMC 810	○	1	10	10	70	20	-	8.5	+3°	-6°	Fig.2	**SB-2545TR**	**FT-8**	
812	○	1	12	12	80	25	-		+3°	-5°				
DMC 014	○	1	14	16	90	25	-	11.0	+3°	-4°	Fig.2	**SB-3060TR**	**FT-10**	
016	○	1	16	16	90	25	-		+4°	-2°				
020	○	2	20	20	110	30	-		+5°	0°				

● Applicable Insert

NDCT...(T/F)R



NDMM...ER-SP

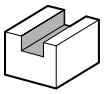
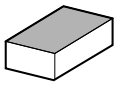


Endmill	Insert
DMC8○○(-S○○)	**NDMM090204ER-SP** **NDCT0902○○(T/F)R**
DMC0○○	**NDMM1202○○ER-SP** **NDCT1202○○(T/F)R**

Description	Dimension (mm)						Angle (°)		Insert Grade												
									Cermet		PVD Coated						Carbide		Diamond		
	A	T	ϕd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDCT 090204TR **090204FR**	6.35	2.38	2.8	9.5	0.4		15°		○	○							●					
NDCT 120208TR **120208FR**	7.94	2.38	3.4	12.7	0.8		15°		○	○							○					
NDMM 090204ER-SP	6.35	2.38	2.8	9.5	0.4		15°		○	○		○		○								
NDMM 120204ER-SP **120208ER-SP**	7.94	2.38	3.4	12.7	0.4 0.8		15°		○ ○	○ ○		○ ○		○ ○								

● : Std. Stock ○ : Check Availability

Endmill [ND□□ 15 Insert]

Shouldering	Grooving	Facing
		

■ DMC-SX

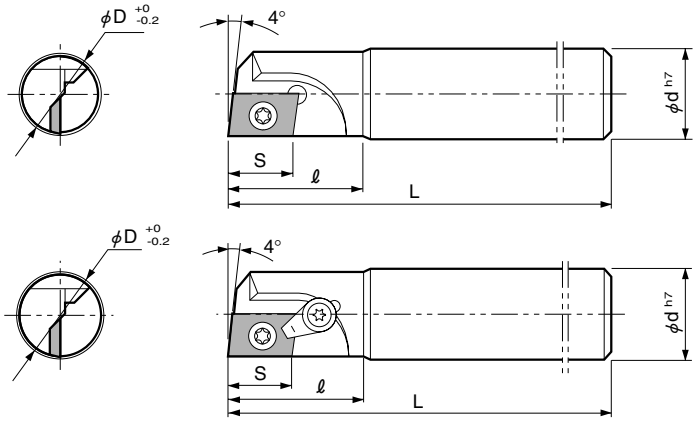


Fig.1

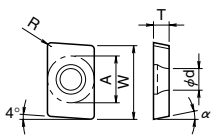
Fig.2

● Toolholder Dimension

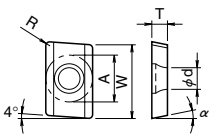
Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Shape	Spare Parts: Clamp Set	Clamp Screw	Wrench
DMC 316SXT	○	1	16	16	90	30	14.0		+3°	-3°	Fig.1	-	SB-4065TR	FT-15
320SX	○	1	20	20	110	30				-3°	Fig.2	CPS-2TR		
325SX	○	2	25	25	120	40				-2°				
332SX	○	2	32	32	130	40				0°				
340SX	○	2	40	32	150	40				0°				
DMC 320SX-200	○	1	20	20	200	50	14.0		+3°	-3°	Fig.1	-	SB-4065TR	FT-15
325SX-220	○	2	25	25	220	60				-2°				
332SX-250	○	2	32	32	250	80				0°				

● Applicable Insert

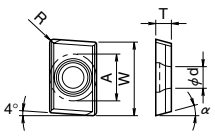
NDCW...TR



NDCT...(T/F)R



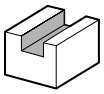
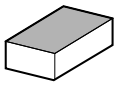
NDMM...ER-SP



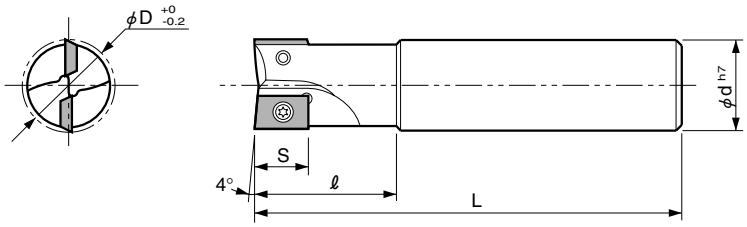
Description	Dimension (mm) A	T	φd	W	R		Angle (°) α		Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
NDCW 150302TR	9.525	3.18	4.5	15.0	0.2		15°		○	○												
150304TR					0.4				○	○		○		○								
150308TR					0.8				○	○		○		○								
150320TR					2.0				○	○												
150330TR					3.0				○	○												
150340TR					4.0				○	○												
NDCT 150308TR	9.525	3.18	4.5	15.0	0.8		15°		○	○		○		○								
150308FR																	○					
NDMM 150304ER-SP	9.525	3.18	4.4	15.0	0.4		15°		○	○		●		●								
150308ER-SP					0.8				●	○		○		●								

· When installing inserts with corner-R 2.0/3.0/4.0, Grind off the corner part of the tool's insert pocket not to contact the workoiece.

Endmill [ND□□ 15 Insert]

Shouldering	Grooving	Facing
		

■ DMC-H (High Rake type)

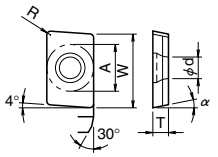


● Toolholder Dimension

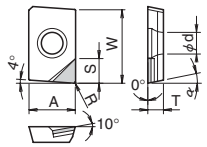
Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Shape	Spare Parts Clamp Screw	Wrench
DMC 316H	○	1	16	16	90	30	14.0		+5°	-3.5°	-	SB-4065TR	FT-15
320H	○	1	20	20	110	30			+6°	-2°			
325H	●	2	25	25	120	40			+8°	-2°			
332H	●	2	32	32	130	40			+8°	0°			
340H	○	2	40	32	150	40			+8°	0°			

● Applicable Insert

NDCW...(T/F)RX

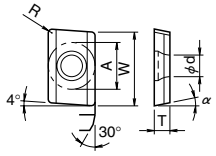


NDCW...FRX

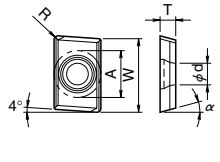


Diamond

NDCT...TRX



NDMM...ER-SP

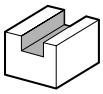
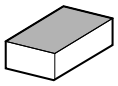


Description	Dimension (mm) A	T	φd	W	R	S	Angle (°) α		Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
NDCW 150302TRX	9.525	3.18	4.4	15.0	0.2	-	15°		●													
NDCW 150304TRX					0.4				●													
NDCW 150308TRX					0.8				●	○												
NDCW 150308FRX					0.8												●					
NDCW 150320TRX					2.0				●													
NDCW 150330TRX					3.0				●	●												
NDCW 150340TRX					4.0				●													
NDCW 150302FRX	9.525	3.18	4.4	15.0	0.2	4.9	15°												○	○		○
NDCT 150308TRX	9.525	3.18	4.4	15.0	0.8	-	15°		○	○												
NDMM 150304ER-SP	9.525	3.18	4.4	15.0	0.4	-	15°		○	○		●		●								
NDMM 150308ER-SP					0.8				●	○		○		●								

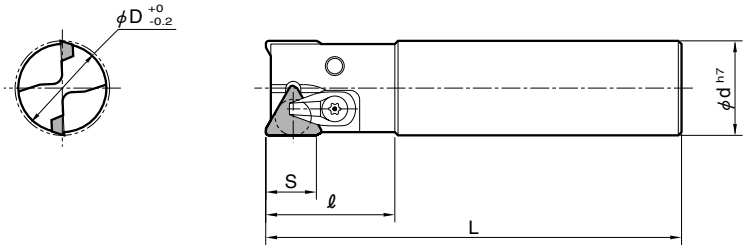
· Above inserts are available to DMC○○○SX type too, but the conventional NDCW1503○○TR insert is not available to DMC○○○H type tool.

● : Std. Stock ○ : Check Availability

Endmill [TP□□, TE□□ Insert]

Shouldering	Grooving	Facing
		

■ MTPS · MTES



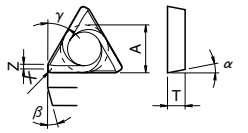
● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Shape	Spare Parts Clamp Set	Wrench	
MTPS 216	○	1	16	16	80	25	9.0		+3°	-5°	-	CPS-2S	FT-15	
MTPS 220	○	2	20	20	90	30			+5°	-4°				
MTES 325	○	2	25	25	110	35	13.5		+11°	-2°	-	CPS-5E	FT-15	
MTES 330	○	2	30	32	125	45			+15°	-2°				
MTES 335	○	3	35	32	125	45			+15°	0°				

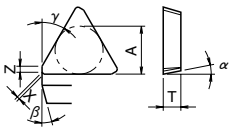
● Applicable Insert

Endmill	Insert
MTPS···	TPGN1103○○ TPMN1103○○
MTES···	TEMR1603PTER-H TEKN1603PT(T/F)R TEEN1603PTFR

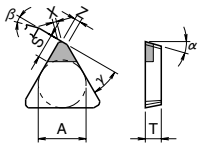
TEMR...PTER-H



TEKN...PT(T/F)R

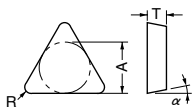


TEEN...PTFR

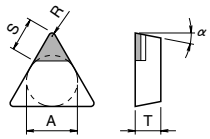


Diamond

TPG(M)N...



TPGN...



CBN, Diamond

Description	Dimension (mm) A	T	R	X	Z	S	Angle (°) α	β	γ	Insert Grade: Cermet TN60	TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	CBN KBN10B	KBN25B	Diamond KPD025	KPD010	KPD002	KPD001
TEMR 1603PTER-H	9.525	3.18	-	R0.8	1.2	-	20°	22°	30°					○		●										
TEKN 1603PTTR	9.525	3.18	-	R0.8 0.7	1.0 1.4	-	20°	22°	30°	○	●	○	●	○		○				○						
1603PTFR	9.525	3.18	-	0.7	1.4	-	20°	22°	30°										●							
TEEN 1603PTFR	9.525	3.18	-	0.6	1.4	-	20°	22°	30°										●							
TEEN 1603PTFR	9.525	3.18	-	0.6	1.4	3.9	20°	22°	30°															○		○
TPMN 110304	6.35	3.18	0.4	-	-	-	11°	-	-										●							
110308			0.8																●							
TPGN 110302	6.35	3.18	0.2	-	-	-	11°	-	-										○							
110304			0.4							●									○							
110308			0.8							●									○							
TPGN 110302	6.35	3.18	0.2	-	-	3.9	11°	-	-														○	○		○
110304			0.4			3.7															○	○		○	○	○
110308			0.8			3.4															○	○		○		

● : Std. Stock ○ : Check Availability

DMC/DMC-SX/DMC-H : MTPS·MTES Recommended Cutting Conditions

◆ DMC / DMC-SX Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min)										Max. ap (mm)		
		Cermet		PVD Coated						Carbide				
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	Cutting Dia. (ϕD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	~0.15	☆ 120~200	☆ 120~200		☆ 100~200		★ 120~200					~ϕ12	1.5	4×2
												ϕ14~	2	6×2
Carbon Steel (SXXC)	~0.2	★ 120~200	☆ 120~200		☆ 100~200		★ 120~200					~ϕ12	2	6×2
												ϕ14~	3	9×3
Alloy Steel (SCM, etc.)	~0.2	★ 100~180	☆ 100~180		☆ 100~180		★ 100~180					~ϕ12	2	6×2
												ϕ14~	3	9×3
Metal Mold Steel (SKD/NAK, etc.)	~0.15	★ 100~180	☆ 100~180		☆ 80~150		★ 80~150					~ϕ12	2	6×2
												ϕ14~	3	9×3
Cast Iron (FC/FCD, etc.)	~0.2									★ 80~150		~ϕ12	2	6×2
												ϕ14~	3	9×3
Non-ferrous Metal (Aluminum, etc.)	~0.2									★ 100~300		~ϕ12	2	6×2
												ϕ14~	3	9×3

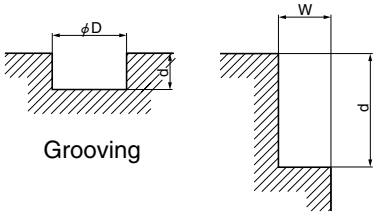
· Use DMC8○○ type under d = 6mm for shouldering.

★: 1st Recommendation ☆: 2nd Recommendation

◆ DMC-H Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min)												Max. ap (mm)		
		Cermet		PVD Coated						Carbide	Diamond					
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	KPD025	KPD010	KPD001	Cutting Dia. (ϕD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	~0.15	☆ 120~200	☆ 120~200		☆ 100~200		★ 120~200							~ϕ20	3	6×2
														ϕ25~	6	13×3
Carbon Steel (SXXC)	~0.2	★ 120~200	☆ 120~200		☆ 100~200		★ 120~200							~ϕ20	4	8×4
														ϕ25~	8	14×6
Alloy Steel (SCM, etc.)	~0.2	★ 100~180	☆ 100~180		☆ 100~180		★ 100~180							~ϕ20	4	8×4
														ϕ25~	8	13×6
Metal Mold Steel (SKD/NAK, etc.)	~0.15	★ 100~180	☆ 100~180		☆ 80~150		★ 80~150							~ϕ20	3	5×2
														ϕ25~	6	10×3
Cast Iron (FC/FCD, etc.)	~0.2									★ 80~150				~ϕ20	4	8×4
														ϕ25~	6	14×6
Non-ferrous Metal (Aluminum, etc.)	~0.2									★ 100~300	☆ 300~500	★ 300~500	☆ 300~500	~ϕ20	4	8×4
														ϕ25~	6	14×6

★: 1st Recommendation ☆: 2nd Recommendation

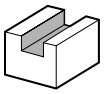
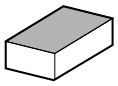


◆ MTPS · MTES Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min)														Max. ap (mm)		
		Cermet			PVD Coated			Carbide		CBN		Diamond						
		TN60	TN100M	TC60	PR510	PR630	PR730	KW10	PW30	KBN10B	KBN25B	KPD025	KPD010	KPD002	KPD001	Cutting Dia. (ϕD)	Grooving (d)	Shouldering (d×W)
Stainless Steel (SUS304, etc)	~0.12		☆ 120~200	☆ 120~200		☆ 120~200	★ 120~200		☆ 80~120							~ϕ20	2	5×2
																ϕ25~	4	13×5
Carbon Steel (SXXC)	~0.15	☆ 150~200	★ 120~200	☆ 120~200		☆ 120~200	★ 120~200		☆ 60~120							~ϕ20	3	6×2
																ϕ25~	6	13×5
Alloy Steel (SCM, etc.)	~0.15	☆ 120~200	★ 100~180	☆ 100~180		☆ 100~180	★ 100~180		☆ 60~120							~ϕ20	3	6×2
																ϕ25~	6	13×5
Metal Mold Steel (SKD/NAK, etc.)	~0.15	☆ 120~200	★ 100~180	☆ 100~180		☆ 80~150	★ 80~150		☆ 60~120							~ϕ20	3	6×2
																ϕ25~	6	13×5
Cast Iron (FC/FCD, etc.)	~0.2				★ 80~180			☆ 80~150		☆ 300~500	★ 300~500					~ϕ20	3	6×2
																ϕ25~	6	13×5
Non-ferrous Metal (Aluminum, etc.)	~0.2							★ 100~300				☆ 300~500	★ 300~500	☆ 300~500	☆ 300~500	~ϕ20	3	6×2
																ϕ25~	6	13×5
High Hard Mat'l	~0.05										★ 80~150					~ϕ20	-	2×0.5
																ϕ25~	-	-

★: 1st Recommendation ☆: 2nd Recommendation

Endmill [TEMT Insert]

Shouldering	Grooving	Facing
		

■ MEAL (Aluminium Machining)

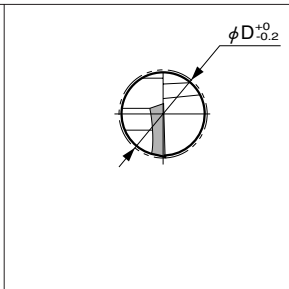


Fig.1

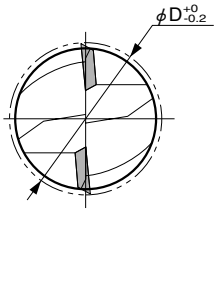
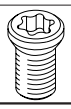
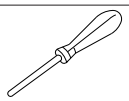


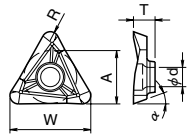
Fig.2

● Toolholder Dimension

Description	Stock	No. of Insert	Dimension (mm) φD	φd	L	ℓ	S		Rake Angle (°) A.R.	R.R.	Shape	Spare Parts Clamp Screw	Wrench	
														
MEAL 25-S25	●	1	25	25	140	60	20		+12°	-7°	Fig.1	**SB-5085TR**	**DT-20**	
50-S32	●	2	50	32	150	45	20		+12°	-3.5°	Fig.2			

● Applicable Insert

TEMT...-AQ



Description	Dimension (mm) A	T	φd	W	R		Angle (°) α		Insert Grade Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
TEMT 250624-AQ	15.875	6.35	5.5	23.0	2.4		20°										●					

◆ Recommended Cutting Conditions

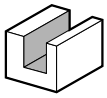
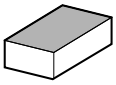
Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min) Carbide KW10
Non-ferrous Metal (Aluminum, etc.)	0.1～0.3	★ 300～500

· *ap* is recommended to be under 15.0mm

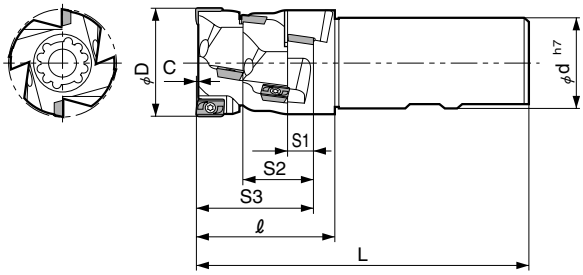
★: 1st Recommendation

● : Std. Stock

Helical Endmill [ND□□ Insert]

Shouldering	Deep Grooving	Facing
		

■ MHD-SA Separate-type (Base Unit A + 2 Front Pieces)



● Toolholder Dimension

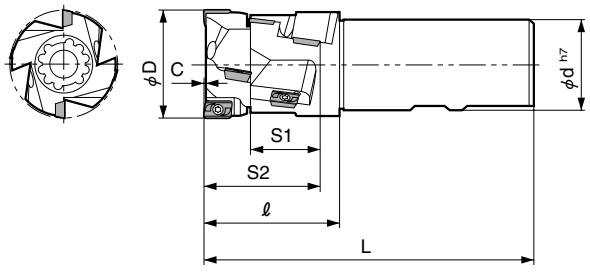
Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm)								Rake Angle (°)	
				φD	φd	L	ℓ	C	S1	S2	S3	A.R.	R.R.
MHD 32-S32-SA	○	10	2	32	32	132	50	0.7	8.3	24.7	41.8	+9°	-7°
40-S32-SA	●	10	2	40	32	147	64	0.9	10.9	31.9	53.8		-3°
40-S40-SA	●	10	2	40	40	154	64	0.9	10.9	31.9	53.8		-3°
40-S42-SA	○	10	2	40	42	154	64	0.9	10.9	31.9	53.8		-3°
50-S42-SA	●	10	2	50	42	154	64	0.9	10.9	31.9	53.8		-1°

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Applicable Insert and Composition of Toolholder

Endmill	Applicable Insert ⇨ P.389	Base Unit ⇨ P.396	Front Piece (Middle) ⇨ P.397	Front Piece (End) ⇨ P.397
MHD 32-S32-SA	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2	MHD32-S32-A	MHD32-F	MHD32-F
40-S32-SA	NDMM12T308ER-T/N2/N3	MHD40-S32-A	MHD40-F	MHD40-F
40-S40-SA		MHD40-S40-A		
40-S42-SA		MHD40-S42-A		
50-S42-SA	NDMM12T308ER-T/N2/N3	MHD50-S42-A	MHD50-F	MHD50-F

■ MHD-SB Separate-type (Base Unit B + 1 Front Piece)



● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm)								Rake Angle (°)	
				φD	φd	L	ℓ	C	S1	S2		A.R.	R.R.
MHD 40-S42-SB	○	10	2	40	42	154	64	0.9	31.9	53.8		+9°	-3°
50-S42-SB	○	10	2	50	42	154	64	0.9	31.9	53.8			-1°

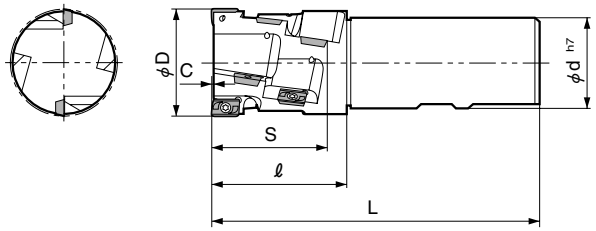
· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Applicable Insert and Composition of Toolholder

Endmill	Applicable Insert ⇨ P.389	Base Unit ⇨ P.396	Front Piece (End) ⇨ P.397
MHD 40-S42-SB	NDMM12T308ER-T/N2/N3	MHD40-S42-B	MHD40-F
50-S42-SB	NDMM12T308ER-T/N2/N3	MHD50-S42-B	MHD50-F

● : Std. Stock ○ : Check Availability

■ MHD-C Integral type



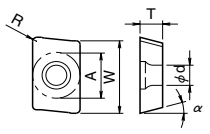
● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	ℓ	C	S	Rake Angle (°) A.R.	R.R.	Applicable Insert
MHD 20S-S20-C	●	3	1	20	20	96	24.5	0.5	17.5	+9°	-7°	NDKW090304ER NDKT0903○○(E/T)R-V
25-S25-C	●	8	2	25	25	116	41.5	0.5	34.5		-3°	NDKT090304ER-N1/N2
32-S32-C	●	10	2	32	32	132	50	0.7	41.8		-7°	NDKT090304ER-N1/N2
40-S42-C	○	10	2	40	42	154	64	0.9	53.8		-3°	NDMM12T308ER-T/N2/N3
50-S42-C	○	10	2	50	42	154	64	0.9	53.8		-1°	NDMM12T308ER-T/N2/N3

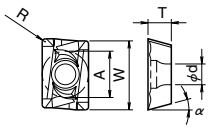
· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Applicable Insert

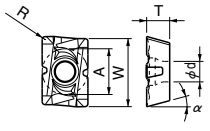
NDKW...ER



NDKT...(E/T) R-V

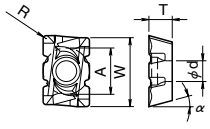


NDKT...ER-N1



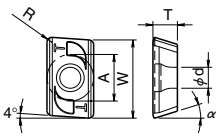
1-Nicked

NDKT...ER-N2

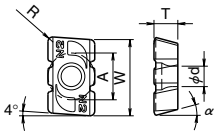


2-Nicked

NDMM...ER-T

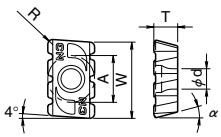


NDMM...ER-N2



2-Nicked

NDMM...ER-N3



3-Nicked

Description		Dimension (mm) A	T	φd	W	R		Angle (°) α		Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
NDKW	**090304ER**	6.35	3.18	2.8	9.5	0.4		15°		○		○		○	○			●					
NDKT	**090304ER-V**									●		●	○	●	●			●					
	090304TR-V													●	●								
	090308ER-V					0.8						●		●	●								
NDKT	**090304ER-N1**	6.35	3.18	2.8	9.5	0.4		15°		○		○	○	●	○			○					
	090304ER-N2									○		●	○	●	●			●					
NDMM	**12T308ER-T**	7.58	3.97	3.4	12.7	0.8		15°		●		●		●	●			●					
	12T308ER-N2	7.79								●		●		●	●			●					
	12T308ER-N3	7.79								●		●		●	●			●					

· IMPORTANT: See P. 402-403 for Nicked Insert's installation

Helical Endmill

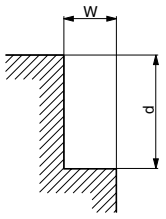
◆ Recommended Cutting Conditions

Work Material	f (mm/tooth)		Recommended Grade (V_C: m/min)									
			Cermet		PVD Coated						Carbide	
	ϕD ϕ20～ϕ32	ϕD ϕ40～ϕ50	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
Stainless Steel (SUS304, etc)	0.05~0.13	0.05~0.18	☆ 100～200			☆ 80～180	★ 60～150	☆ 80～180				
Carbon Steel (SXXC)	0.05~0.15	0.05~0.2	★ 100～200			☆ 80～180	☆ 60～150	★ 80～180				
Alloy Steel (SCM, etc.)	0.05~0.15	0.05~0.2	★ 80～180			☆ 80～180	☆ 60～150	★ 80～180				
Metal Mold Steel (SKD/NAK, etc.)	0.05~0.15	0.05~0.2	★ 80～180			☆ 60～150	☆ 60～130	★ 60～150				
Cast Iron (FC/FCD, etc.)	0.05~0.15	0.05~0.2			★ 60～150						☆ 60～130	
Non-ferrous Metal (Aluminum, etc.)	0.05~0.15	0.05~0.2									★ 100～300	

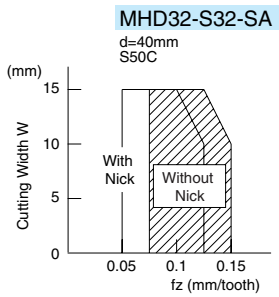
· Reduce a*p* by 20-50% at the machining with long overhang length or using long shank type
· Reduce V_C by 20-50% at the machining with multiple Front Pieces
· Compressed air is recommended for smooth in chip evacuation.

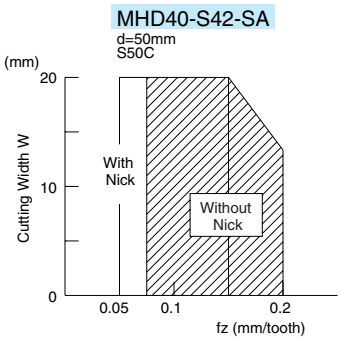
★: 1st Recommendation ☆: 2nd Recommendation

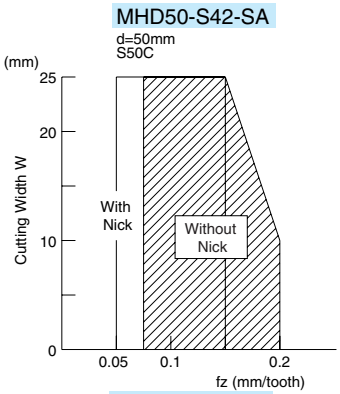
● Separate Type

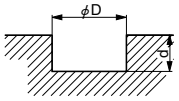


Shouldering

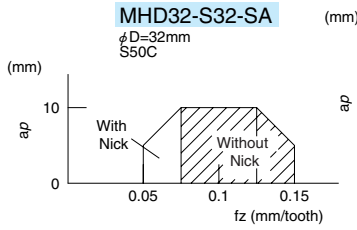


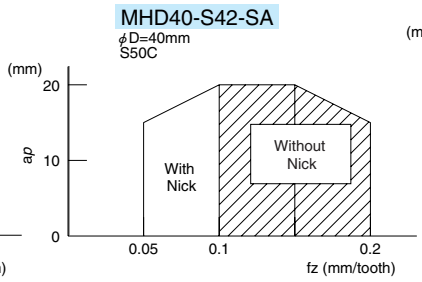


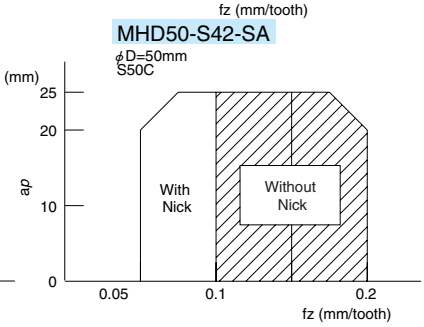




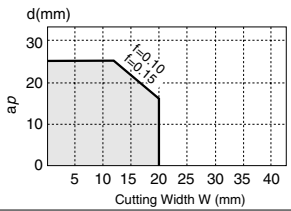
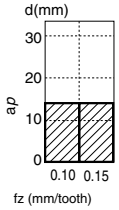
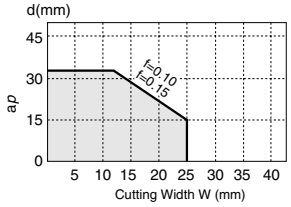
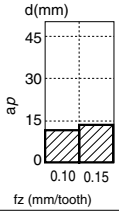
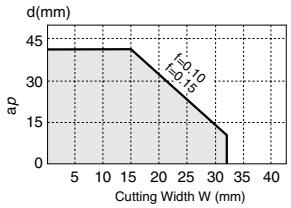
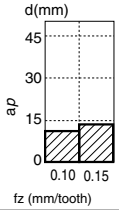
Grooving







● Integral Type

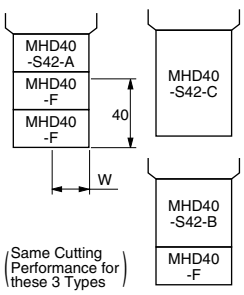
Description	Shouldering	Grooving
MHD20S-S20-C		
MHD25-S25-C		
MHD32-S32-C		

Work Material: S50C

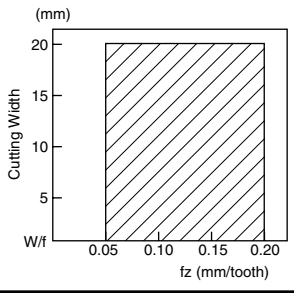
◆ Cutting Performance at Shouldering [Work Material: S50C]

Cutting Dia. ϕ40

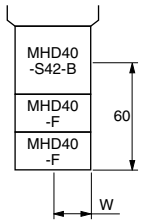
Combination	Cutting Speed	V_C=70～120m/min



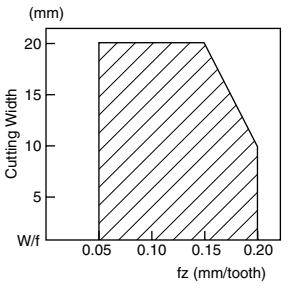
d = 40



Combination	Cutting Speed	V_C=70～120m/min

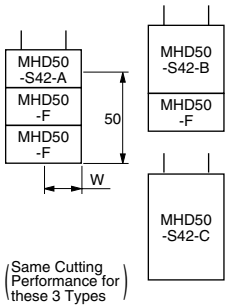


d = 60

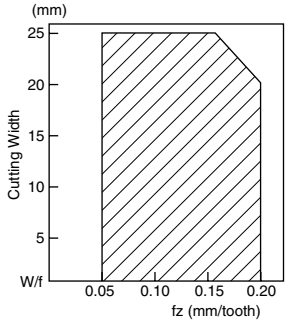


Cutting Dia. ϕ50

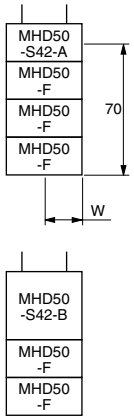
Combination	Cutting Speed	V_C=70～120m/min



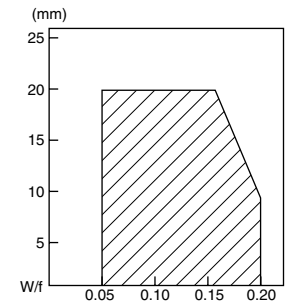
d = 50



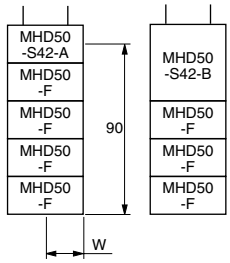
Combination	Cutting Speed	V_C=70～120m/min (W=15mm) V_C=60～90m/min (W=15～20mm)



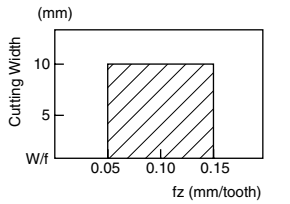
d = 70



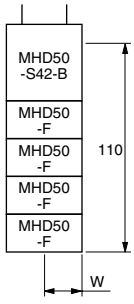
Combination	Cutting Speed	V_C=70～120m/min



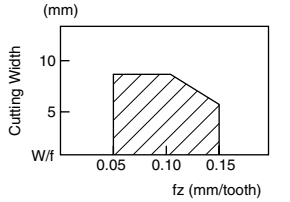
d = 90

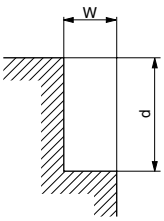


Combination	Cutting Speed	V_C=70～120m/min



d = 110





Shouldering

Insert

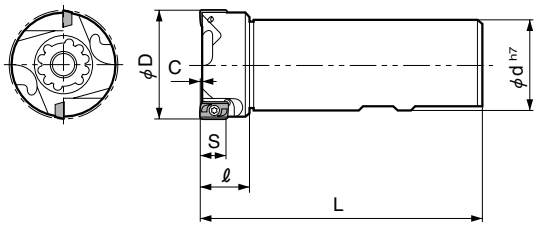
NDMM12T308ER-N2/N3

(With Nick)

PR660

Helical Endmill [ND□□ Insert]

■ MHD-A Base Unit A-type



● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	ℓ	C	S			Rake Angle (°) A.R.	R.R.
MHD 32-S32-A	○	2	2	32	32	100	18.7	0.7	9.0				-7°
40-S32-A	○	2	2	40	32	106	23	0.9	11.8				-3°
40-S40-A	○	2	2	40	40	113	23	0.9	11.8			+9°	-3°
40-S42-A	○	2	2	40	42	113	23	0.9	11.8				-3°
50-S42-A	○	2	2	50	42	113	23	0.9	11.8				-1°
MHD 32-S32-A-130	○	2	2	32	32	130	32.8	0.7	9.0				-7°
40-S32-A-150	○	2	2	40	32	150	42	0.9	11.8			+9°	-3°
50-S42-A-150	○	2	2	50	42	150	42	0.9	11.8				-1°

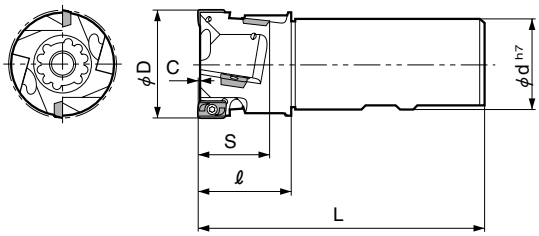
· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Applicable Insert and Front Piece

Endmill	Applicable Insert ➡ P.393	Front Piece (Middle) ➡ P.397	Front Piece (End) ➡ P.397, 430
MHD 32-S32-A	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2	MHD32-F	MHD32-F, (MHD32-4RF)
40-S32-A	NDMM12T308ER-T/N2/N3	MHD40-F	MHD40-F, (MHD40-5RF)
40-S32-A			
40-S40-A			
50-S42-A	NDMM12T308ER-T/N2/N3	MHD50-F	MHD50-F, (MHD50-6RF)
MHD 32-S32-A-130	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2	MHD32-F	MHD32-F, (MHD32-4RF)
40-S32-A-150	NDMM12T308ER-T/N2/N3	MHD40-F	MHD40-F, (MHD40-5RF)
50-S42-A-150	NDMM12T308ER-T/N2/N3	MHD50-F	MHD50-F, (MHD50-6RF)

· Component in ( ) is for Radius Plus Mill Series. ➡ P.430

■ MHD-B Base Unit B-type



● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	ℓ	C	S			Rake Angle (°) A.R.	R.R.
MHD 40-S42-B	○	6	2	40	42	133	42	0.9	32.8			+9°	-3°
50-S42-B	○	6	2	50	42	133	42	0.9	32.8				-1°

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

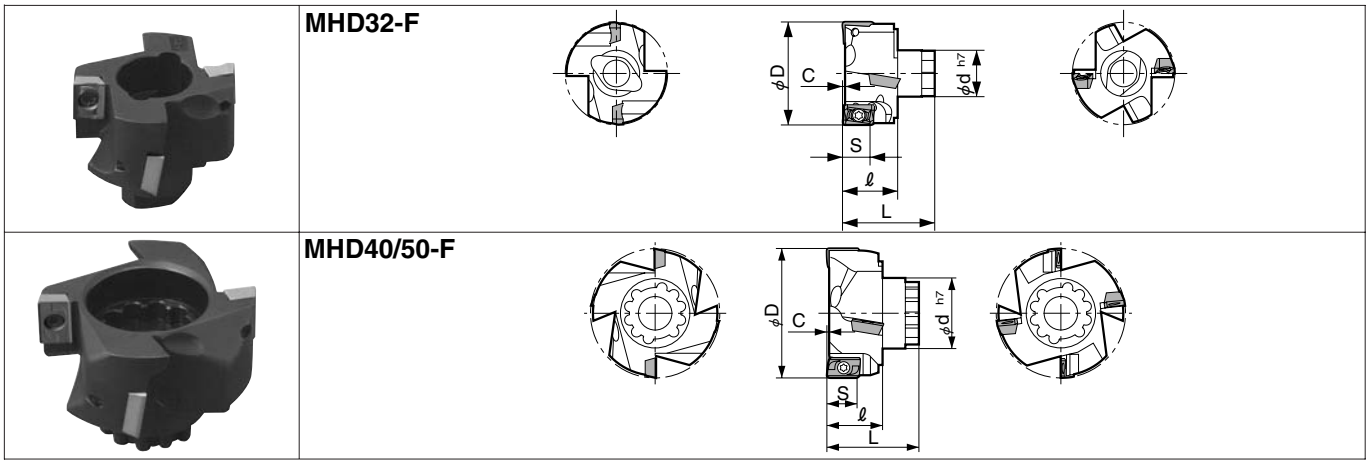
● Applicable Insert and Front Piece

Endmill	Applicable Insert ➡ P.393	Front Piece (End) ➡ P.397, 430
MHD 40-S42-B	NDMM12T308ER-T/N2/N3	MHD40-F, (MHD40-5RF)
50-S42-B	NDMM12T308ER-T/N2/N3	MHD50-F, (MHD50-6RF)

· Component in ( ) is for Radius Plus Mill Series. ➡ P.430

● : Std. Stock ○ : Check Availability

■ MHD-F Front Piece

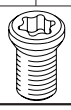
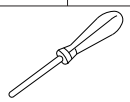
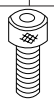


● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	ℓ	C	S	Rake Angle (°) A.R.	R.R.	Applicable Insert ⇒P.393
MHD 32-F	●	4	2	32	14.4	28.6	17.1	0.7	9.0	+9°	-7°	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2
40-F	●	4	2	40	19	35	21.9	0.9	11.8		-3°	NDMM12T308ER-T/N2/N3
50-F	●	4	2	50	27	36	21.9	0.9	11.8		-1°	NDMM12T308ER-T/N2/N3

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

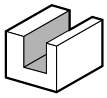
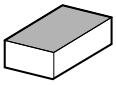
● Spare Parts

Description		Spare Parts: Clamp Screw For Bottom Insert	Clamp Screw For Middle Insert	Wrench For Bottom Insert	Wrench For Middle Insert	Clamp Bolt For 1 Front Piece	Clamp Bolt For 2 Front Pieces	Wrench	Anti-seize Compound
									
Separate type	MHD 32-S32-SA	SB-2560TR		DT-8		-	HH8X50	LW-6	MP-1
	40-S32-SA	SB-3080TR		DT-10		-	HH8X65	LW-6	
	40-S40-SA								
	40-S42-SA								
	50-S42-SA	SB-3080TR		DT-10		-	HH12X65	LW-10	
	MHD 40-S42-SB	SB-3080TR		DT-10		HH8X40	-	LW-6	MP-1
	50-S42-SB					HH12X40	-	LW-10	
Integral type	MHD 20S-S20-C	SB-2560TR		DT-8		-	-	-	MP-1
	25-S25-C								
	32-S32-C								
	40-S42-C	SB-3080TR		DT-10					
	50-S42-C								
Base Unit	MHD 32-S32-A	SB-2560TR		DT-8		-	HH12X65	LW-10	MP-1
	40-S32-A	SB-3080TR		DT-10		-	HH8X65	LW-6	
	40-S40-A								
	40-S42-A								
	50-S42-A	SB-3080TR		DT-10		-	HH12X65	LW-10	
	MHD 32-S32-A-130	SB-2560TR		DT-8		-	HH8X65	LW-6	MP-1
	40-S32-A-150	SB-3080TR		DT-10					
	50-S42-A-150					-	HH12X65	LW-10	
	MHD 40-S42-B	SB-3080TR		DT-10		HH8X40	-	LW-6	MP-1
	50-S42-B					HH12X40	-	LW-10	
Front Piece	MHD 32-F	SB-2560TR		DT-8		-	-	-	-
	40-F	SB-3080TR		DT-10					
	50-F								

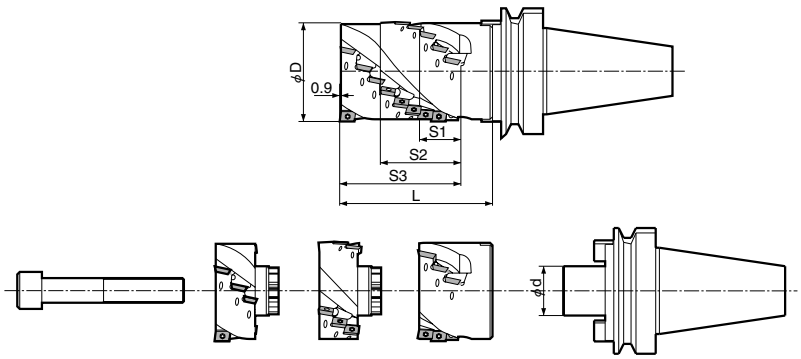
· In case of purchasing Front Piece only, Wrench (DT-8 or DT-10) is not attached to the product.
· In case of purchasing Base Unit and Front Pieces separately, Clamp Bolt and Wrench are not attached. Prepare them separately.
· Various Clamp Bolts for Front Piece attachment are ready. ⇒P.404
· Clamp Bolt for regular-type Front Piece (MHD···F) is attached to separate-type (MHD···SA/-SB) and Base Unit (MHD···A/-B)
· In case of replacing with Radius-type Front Piece (MHD···RF), different type of Clamp Bolt may be required. ⇒P.404

● : Std. Stock ○ : Check Availability

Helical Endmill [NDMM Insert]

Shouldering	Deep Grooving	Facing
		

■ MHD-FMA-SA Arbor-Free type (Base Unit + 2 Front Pieces + Clamp Bolt)



Prepare Arbor separately.

Use Nicked Insert. (-N2, -N3)

● Toolholder Dimension

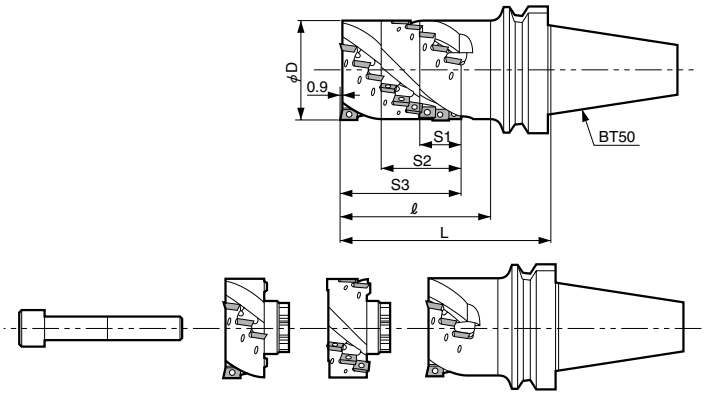
Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	C	S1	S2	S3	Rake Angle (°) A.R.	R.R.	Weight (Kg)
MHD 63-FMA-SA	○	21	3	63	31.75	102.9	0.9	31.8	52.8	74.7	+9°	0°	1.6
80-FMA-SA	○	27	3	80	38.1	123.9	0.9	31.8	63.3	95.7			3.5
100-FMA-SA	○	40	4	100	50.8	129.9	0.9	42.3	73.8	106.2			5.7

· Above weight does not include arbor's weight

● Applicable Insert and Composition of Toolholder

Endmill	Applicable Insert ➡ P.399	Base Unit ➡ P.400	Front Piece(2pcs) ➡ P.401	Applicable Arbor
MHD 63-FMA-SA	NDMM12T308ER-N2/N3	MHD63-FMA-A	MHD63-F	BT50-FMA31.75-○○
80-FMA-SA	NDMM12T308ER-N2/N3	MHD80-FMA-A	MHD80-F	BT50-FMA38.1-○○
100-FMA-SA	NDMM12T308ER-N2/N3	MHD100-FMA-A	MHD100-F	BT50-FMA50.8-○○

■ MHD-BT50-SA Integral Arbor type (Base Unit + 2 Front Pieces + Clamp Bolt)



Use Nicked Insert (-N2, -N3)

● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	L	ℓ	C	S1	S2	S3	Rake Angle (°) A.R.	R.R.	Weight (Kg)
MHD 63-BT50-SA	●	21	3	63	137	89	0.9	31.8	52.8	74.7	+9°	0°	5.3
80-BT50-SA	●	27	3	80	158	110	0.9	31.8	63.3	95.7			7.6
100-BT50-SA	○	40	4	100	168	129.9	0.9	42.3	73.8	106.2			10.2

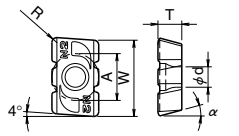
● Applicable Insert and Composition of Toolholder

Endmill	Applicable Insert ➡ P.399	Base Unit ➡ P.400	Front Piece(2pcs) ➡ P.401
MHD 63-BT50-SA	NDMM12T308ER-N2/N3	MHD63-BT50-A	MHD63-F
80-BT50-SA	NDMM12T308ER-N2/N3	MHD80-BT50-A	MHD80-F
100-BT50-SA	NDMM12T308ER-N2/N3	MHD100-BT50-A	MHD100-F

● : Std. Stock ○ : Check Availability

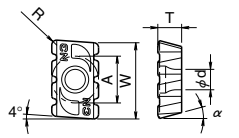
● Applicable Insert

NDMM...ER-N2



2-Nicked

NDMM...ER-N3



3-Nicked

Description	Dimension (mm)						Angle (°)		Insert Grade											
									Cermet		PVD Coated						Carbide		Diamond			
	A	T	ϕd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDMM 12T308ER-N2	7.79	3.97	3.4	12.7	0.8		15°		●		●		●	●			●					
NDMM 12T308ER-N3	7.79	3.97	3.4	12.7	0.8		15°		●		●		●	●			●					

· IMPORTANT: See P. 402-403 for Nicked Insert's installation

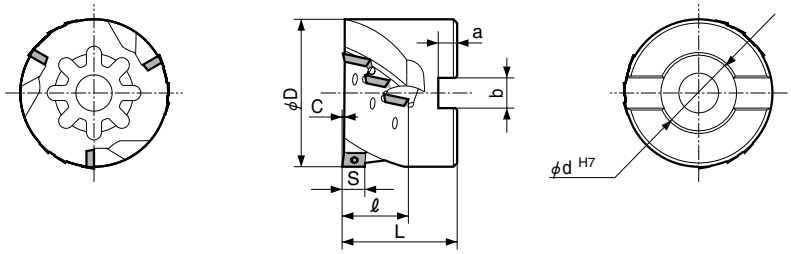
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)		Recommended Grade (V_C: m/min)									
			Cermet		PVD Coated						Carbide	
	ϕD ϕ63~ϕ100		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
Stainless Steel (SUS304, etc)	0.05~0.18		☆ 100~200			☆ 80~180	★ 60~150	☆ 80~180				
Carbon Steel (SXXC)	0.05~0.2		★ 100~200			☆ 80~180	☆ 60~150	★ 80~180				
Alloy Steel (SCM, etc.)	0.05~0.2		★ 80~180			☆ 80~180	☆ 60~150	★ 80~180				
Metal Mold Steel (SKD/NAK, etc.)	0.05~0.2		★ 80~180			☆ 60~150	☆ 60~130	★ 60~150				
Cast Iron (FC/FCD, etc.)	0.05~0.2				★ 60~150						☆ 60~130	
Non-ferrous Metal (Aluminum, etc.)	0.05~0.2										★ 100~300	

· Reduce a*p* by 20-50% at the machining with long overhang length or using long shank type
· Reduce V_C by 20-50% at the machining with multiple Front Pieces
· Compressed air is recommended for smooth in chip evacuation.

★: 1st Recommendation ☆: 2nd Recommendation

■ MHD-FMA-A Base Unit (FMA Arbor-Free type)



Use Nicked Insert. (-N2, -N3)

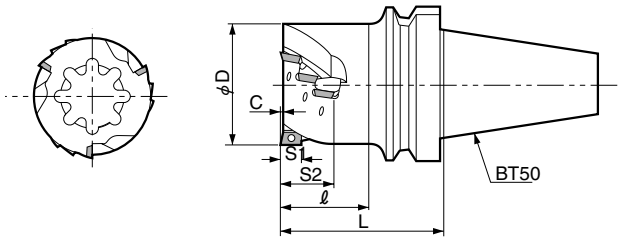
● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm)							Rake Angle (°)		Weight (Kg)
				φD	φd	L	ℓ	C	a	b	A.R.	R.R.	
MHD 63-FMA-A	○	9	3	63	31.75	60.9	32.7	0.9	8	12.7	+9°	0°	0.8
80-FMA-A	○	9	3	80	38.1	60.9	32.7	0.9	10	15.9			1.4
100-FMA-A	○	16	4	100	50.8	66.9	43.2	0.9	11	19.0			2.3

● Applicable Insert and Front Piece/Arbor

Endmill	Applicable Insert ➡ P.399	Aplicable Front Piece ➡ P.401	Applicable Arbor
MHD 63-FMA-A	NDMM12T308ER-N2/N3	MHD63-F	BT50-FMA31.75-○○
80-FMA-A	NDMM12T308ER-N2/N3	MHD80-F	BT50-FMA38.1-○○
100-FMA-A	NDMM12T308ER-N2/N3	MHD100-F	BT50-FMA50.8-○○

■ MHD-BT50-A Base Unit (BT50 Integral Arbor type)



Use Nicked Insert (-N2, -N3)

● Toolholder Dimension

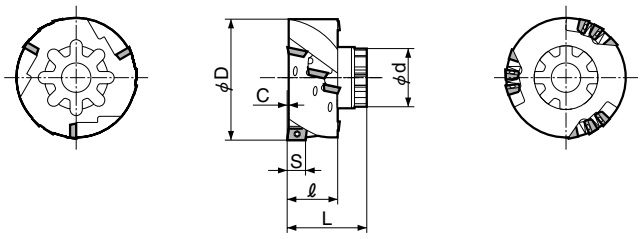
Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm)							Rake Angle (°)		Weight (Kg)
				φD	L	ℓ	C	S1	S2		A.R.	R.R.	
MHD 63-BT50-A	○	9	3	63	94.1	46.1	0.9	11.8	31.8		+9°	+0°	4.5
80-BT50-A	○	9	3	80	94.1	46.1	0.9	11.8	31.8				5.5
100-BT50-A	○	16	4	100	104	66.0	0.9	11.8	42.3				6.8

● Applicable Insert and Front Piece

Endmill	Applicable Insert ➡ P.399	Aplicable Front Piece ➡ P.401
MHD 63-BT50-A	NDMM12T308ER-N2/N3	MHD63-F
80-BT50-A	NDMM12T308ER-N2/N3	MHD80-F
100-BT50-A	NDMM12T308ER-N2/N3	MHD100-F

● : Std. Stock ○ : Check Availability

■ MHD-F Front Piece

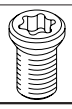
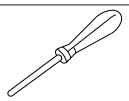
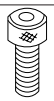
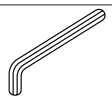
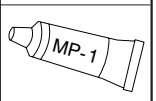


Use Nicked Insert (-N2, -N3)

● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	L	ℓ	C	S	Rake Angle (°) A.R.	R.R.	Weight (Kg)	Applicable Insert ⇒P.399
MHD 63-F	○	6	3	63	32.5	37.9	21.9	0.9	11.8	+9°	0°	0.3	NDMM12T308ER-N2/N3
80-F	○	9	3	80	42	51.9	32.4	0.9	11.8	+9°	0°	0.9	NDMM12T308ER-N2/N3
100-F	○	12	4	100	61	56.4	32.4	0.9	11.8	+9°	0°	1.4	NDMM12T308ER-N2/N3

● Spare Parts

Description		Spare Parts Clamp Screw	Wrench	Clamp Bolt	Wrench	Anti-seize Compound
						
Arbor-Free type	MHD 63-FMA-SA	SB-3080TR	DT-10	HH16X90	LW-14	MP-1
	80-FMA-SA			HH20X110	LW-17	
	100-FMA-SA			HH24X110	LW-19	
Base Unit	MHD 63-FMA-A	SB-3080TR	DT-10	HH16X90	LW-14	MP-1
	80-FMA-A			HH20X110	LW-17	
	100-FMA-A			HH24X110	LW-19	
Integral Arbor type	MHD 63-BT50-SA	SB-3080TR	DT-10	HH16X65	LW-14	MP-1
	80-BT50-SA			HH20X90	LW-17	
	100-BT50-SA			HH24X90	LW-19	
Base Unit	MHD 63-BT50-A	SB-3080TR	DT-10	HH16X65	LW-14	MP-1
	80-BT50-A			HH20X90	LW-17	
	100-BT50-A			HH24X90	LW-19	
Front Piece	MHD 63-F	SB-3080TR	DT-10	-	-	-
	80-F					
	100-F					

· In case of purchasing Front Piece only, Wrench (DT-10) is not attached to the product.
· In case of purchasing Base Unit and Front Pieces separately, Clamp Bolt and Wrench are not attached. Prepare them separately.
· Various Clamp Bolts for Front Piece attachment are ready. ⇒P.404

Caution at Using Nicked Insert

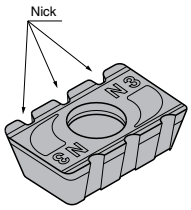
● Caution at installing Nicked Insert

When installing Nicked Insert, It is important to install it in the correct position.
When it is installed wrong, the Tool cannot machine the work and it may damage the toolholder body.

Description	Applicable Toolholder	
	Case A : With Insert Position Mark	Case B: No Insert Position Mark
NDKT 090304ER-N1/N2	MHD25, 32	MEA
NDKT 150408ER-N3	–	MEB, MFB
NDMM 12T308ER-N2/N3	MHD40, 50, 63, 80, 100 ; MSM	–

[Case A]

Pay Attention to followings at Insert Installation
1) NDMM12T308ER-N2 or -N3 to the Insert Pocket with Projection (only MHD40/50)
2) ND□□○○○○○○ER-N2 to the Insert Pocket marked ②
3) ND□□○○○○○○ER-N3 to the Insert Pocket marked ③

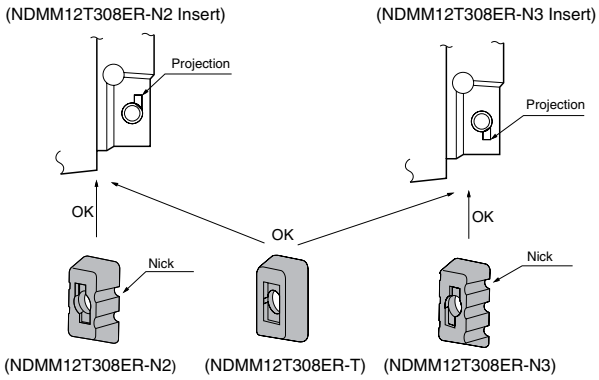


Nicked Insert (-N3)

● Effect of Nicked Insert

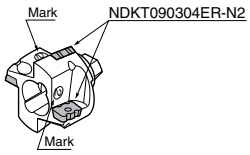
1. Cutting Force Reduction
2. Good Chip Control
3. Anti-Chattering

1. How to Install (MHD40, 50)

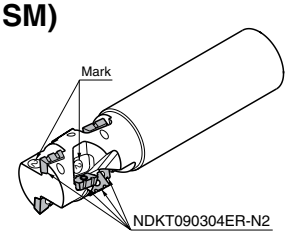


2. How to Install (MHD25, 32, 63, 80, 100 ; MSM)

• NDKT090304ER-N1/N2
※ Insert with "-N1" can be installed to the Position for other than "-N2".

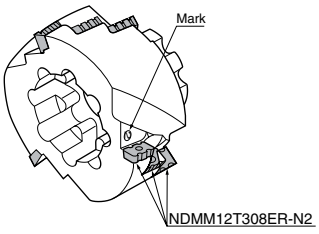


MHD32-F

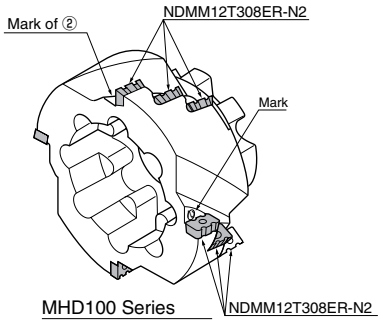


MHD25, 32 Series
(MHD25-S25-C Shown)

• NDMM12T308ER-N2/N3
※ Insert with "-N3" can be installed to the Position for other than "-N2".



MHD63, 80 ; MSM Series
(MHD63-F Shown)



MHD100 Series
(MHD100-F Shown)

[Case B]

It is impossible to use only one type of Insert (-N1 only, -N2 only, -N3 only).
It is necessary to use them in combination.

● : Std. Stock ○ : Check Availability

No. of Insert for Plus Mill / Hurricane Endmill

■ No. of Insert to be Installed to Plus Mill

Description		No. of Insert	No. of Edge Line	NDK□09 Type			FPMT09 Type	RPMT10 Type
				Without Nick	With Nick N1	With Nick N2		
Separate type	MHD 32-S32-SA	10	2	-	5	5	-	-
	MHD 32-S32-4RSA	10	2	-	4	4	2	-
Base Unit	MHD 32-S32-A	2	2	-	1	1	-	-
Front Piece	MHD 32-F	4	2	-	2	2	-	-
	MHD 32-4RF	4	2	-	1	1	2	-
Integral type	MHD 20S-S20-C	3	1	3	-	-		
	25-S25-C	8	2	-	4	4	-	-
	32-S32-C	10	2	-	5	5		
	MHD 20-S20-4RC	3	1	2	-	-	1	-
	25S-S25-4RC	4	1	2	-	-	2	-
	32-S32-5RC	10	2	-	4	4	-	2

Description		No. of Insert	No. of Edge Line	NDMM12 Type		RPMT10 Type	RPMT12 Type
				With Nick N2	With Nick N3		
Separate type	MHD 40-S32-SA	10	2	5	5		
	40-S42-SA	10	2	5	5		
	50-S42-SA	10	2	5	5		
	MHD 63-FMA-SA	21	3	7	14		
	80-FMA-SA	27	3	9	18	-	-
	100-FMA-SA	40	4	20	20		
	MHD 63-BT50-SA	21	3	7	14		
	80-BT50-SA	27	3	9	18		
	100-BT50-SA	40	4	20	20		
	MHD 40-S32-5RSA	10	2	4	4	2	-
	40-S42-5RSA	10	2	4	4	2	-
	50-S42-6RSA	10	2	4	4	-	2
	MHD 40-S42-SB	10	2	5	5	-	-
	50-S42-SB	10	2	5	5		
Base Unit	MHD 40-S32-A	2	2	1	1		
	40-S42-A	2	2	1	1		
	50-S42-A	2	2	1	1		
	MHD 63-FMA-A	9	3	3	6		
	80-FMA-A	9	3	3	6		
	100-FMA-A	16	4	8	8	-	-
	MHD 63-BT50-A	9	3	3	6		
	80-BT50-A	9	3	3	6		
	100-BT50-A	16	4	8	8		
	MHD 40-S42-B	6	2	3	3		
	50-S42-B	6	2	3	3		
Front Piece	MHD 40-F	4	2	2	2		
	50-F	4	2	2	2		
	63-F	6	3	2	4	-	-
	80-F	9	3	3	6		
	100-F	12	4	6	6		
	MHD 40-4RF	4	2	1	1	2	-
	50-5RF	4	2	1	1	-	2
Integral type	MHD 40-S42-C	10	2	5	5	-	-
	50-S42-C	10	2	5	5		
	MHD 40-S42-5RC	10	2	4	4	2	-
	50-S42-6RC	10	2	4	4	-	2

■ No. of Insert to be Installed to Hurricane Endmill

Description		No. of Insert	No. of Edge Line	NDMM12 Type	
				With Nick N2	With Nick N3
Standard type	MSM 63	16	4	8	8
	80	16	4	8	8
	100	24	6	12	12

■ No. of Insert to be Installed to Hurricane Endmill

Description		No. of Insert	NDK□09 Type		
			Without Nick	With Nick N1	With Nick N2
Standard type	MEA 12-S10	1	1	-	-
	12-S16	1	1	-	-
	13-S12	1	1	-	-
	14-S12	1	1	-	-
	16-S12	2	-	1	1
	17-S16	2	-	1	1
	18-S16	2	-	1	1
	19-S16	2	-	1	1
	20-S16	3	-	2	1
	21-S20	3	-	2	1
	22-S20	3	-	2	1
	24-S20	3	-	2	1
	25-S20	3	-	2	1
	28-S25	3	-	2	1
	30-S25	4	-	2	2
	32-S25	4	-	2	2
	40-S32	5	-	3	2
	50-S32	6	-	3	3
	63-S32	8	-	4	4
	80-S32	8	-	4	4
Same Shank Size-type	MEA 10-S10	1	1	-	-
	16-S16	2	-	1	1
	20-S20-Z2	2	-	1	1
	20-S20	3	-	2	1
	25-S25	3	-	2	1
	32-S32	4	-	2	2
Long Shank type	MEA 20-S20-130	2	-	1	1
	25-S25-140	3	-	2	1
	32-S25-160	4	-	2	2
	40-S32-200	4	-	2	2

Description		No. of Insert	NDK□15 Type	
			Without Nick	With Nick N3
Standard type	MEB 25-S20	2	1	1
	25-S25	2	1	1
	32-S25	3	2	1
	32-S32	3	2	1
	40-S32	4	2	2
	50-S32	4	2	2
	63-S32	5	3	2
	80-S32	6	3	3

Description		No. of Insert	NDK□15 Type	
			Without Nick	With Nick N3
Standard type	MFB 63R	6	3	3
	80R	7	4	3
	100R	8	4	4
	125R	9	5	4
	160R	10	5	5

Cutting Edge Length of Plus Mill

Base Unit Description	No. of Edge Line	No. of Insert	Plus Mill ⇒ P.392				Radius Plus Mill ⇒ P.428					
			Front Piece (Middle/End)		Cutting Edge Length (mm)	Clamp Bolt Description	Front Piece (Middle)		Radius Front Piece (End)		Cutting Edge Length (mm)	Clamp Bolt Description
			Description	Q'ty			Description	Q'ty	Description	Q'ty		
MHD32-S32-A	2	6	MHD32-F	1	25.4	HH8X35	MHD32-F	0	MHD32-RF	1	25.6	HH8X35
		10		2	41.8	HH8X50		1		1	42.0	HH8X50
		14		3	58.2	HH8X70		2		1	58.4	HH8X65
MHD40-S32-A	2	6	MHD40-F	1	32.8 (53.8)	HH8X40	MHD40-F	0	MHD40-RF	1	27.2 (48.2)	HH8X35
(MHD40-S32-B)		10		2	53.8 (74.8)	HH8X65		1		1	48.2 (69.2)	HH8X55
MHD40-S40-A		10		3	74.8 (95.8)	HH8X85		2		1	69.2 (90.2)	HH8X80
MHD40-S42-A		14		3	74.8 (95.8)	HH8X85		2		1	69.2 (90.2)	HH8X80
(MHD40-S42-B)		18		4	95.8(116.8)	HH8X110		3		1	90.2(111.2)	HH8X100
MHD50-S42-A	2	6	MHD50-F	1	32.8 (53.8)	HH12X40	MHD50-F	0	MHD50-RF	1	28.2 (49.2)	HH12X40
(MHD50-S42-B)		10		2	53.8 (74.8)	HH12X65		1		1	49.2 (70.2)	HH12X55
		14		3	74.8 (95.8)	HH12X85		2		1	70.2 (91.2)	HH12X80
		18		4	95.8(116.8)	HH12X110		3		1	91.2(112.2)	HH12X100
		22		5	116.8(137.8)	HH12X130		4		1	112.2(133.2)	HH12X120
		26		6	137.8(158.8)	HH12X150		5		1	133.2(154.2)	HH12X140
MHD63-FMA-A	3	9	MHD63-F	0	32.7	HH16X45	-	-	-	-	-	-
		15		1	53.7	HH16X65						
		21		2	74.7	HH16X90						
		27		3	95.7	HH16X110						
		33		4	116.7	HH16X130						
MHD80-FMA-A	3	9	MHD80-F	0	32.7	HH20X40	-	-	-	-	-	-
		18		1	64.2	HH20X75						
		27		2	95.7	HH20X110						
		36		3	127.2	HH20X140						
		45		4	158.7	HH20X170						
MHD100-FMA-A	3	16	MHD100-F	0	43.2	HH24X40	-	-	-	-	-	-
		28		1	74.7	HH24X75						
		40		2	106.2	HH24X110						
		52		3	137.7	HH24X140						
		64		4	169.2	HH24X170						
MHD63-BT50-A	3	15	MHD3-F	1	53.7	HH16X45	-	-	-	-	-	-
		21		2	74.7	HH16X65						
		27		3	95.7	HH16X90						
		33		4	116.7	HH16X110						
MHD80-BT50-A	3	18	MHD80-F	1	64.2	HH20X55	-	-	-	-	-	-
		27		2	95.7	HH20X90						
		36		3	127.2	HH20X120						
		45		4	158.7	HH20X150						
MHD100-BT50-A	4	28	MHD100-F	1	74.7	HH24X60	-	-	-	-	-	-
		40		2	106.2	HH24X90						
		52		3	137.7	HH24X120						
		64		4	169.2	HH24X150						

· Dimension in ( ) is for Base Unit B
· Clamp Bolt Description (HH○○×□□): ○○ means screw standard (M○○), □□ means bolt's nominal length (mm)
· Clamp Bolt Description is common to both Base Unit A and B.

●Difference of Cutting Edge Length between Radius Plus Mill and Plus Mill

Plus Mill's cutting edge length of Front Piece (ℓ1) is different from that (ℓ2) of Radius Plus Mill as shown in Fig. 1.

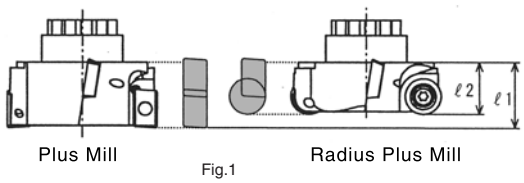


Fig.1

Note: Q'ty of Front Piece to Radius Plus Mill and Plus Mill may be different depending on the *ap*

●Difference of Clamp Bolt Length in the Front Piece

Radius Plus Mill's inserts are sticking out from the bottom of the body for the function of Ramping or Helical Milling, as well as the difference of Front Piece Length.
From this function design, Radius Plus Mill's Clamp Bolt Length in Front Piece becomes shorter than that of Plus Mill as shown in Fig. 2.

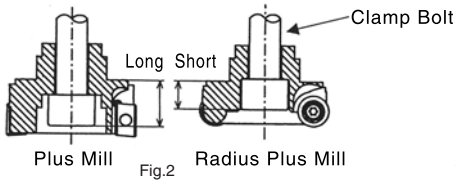
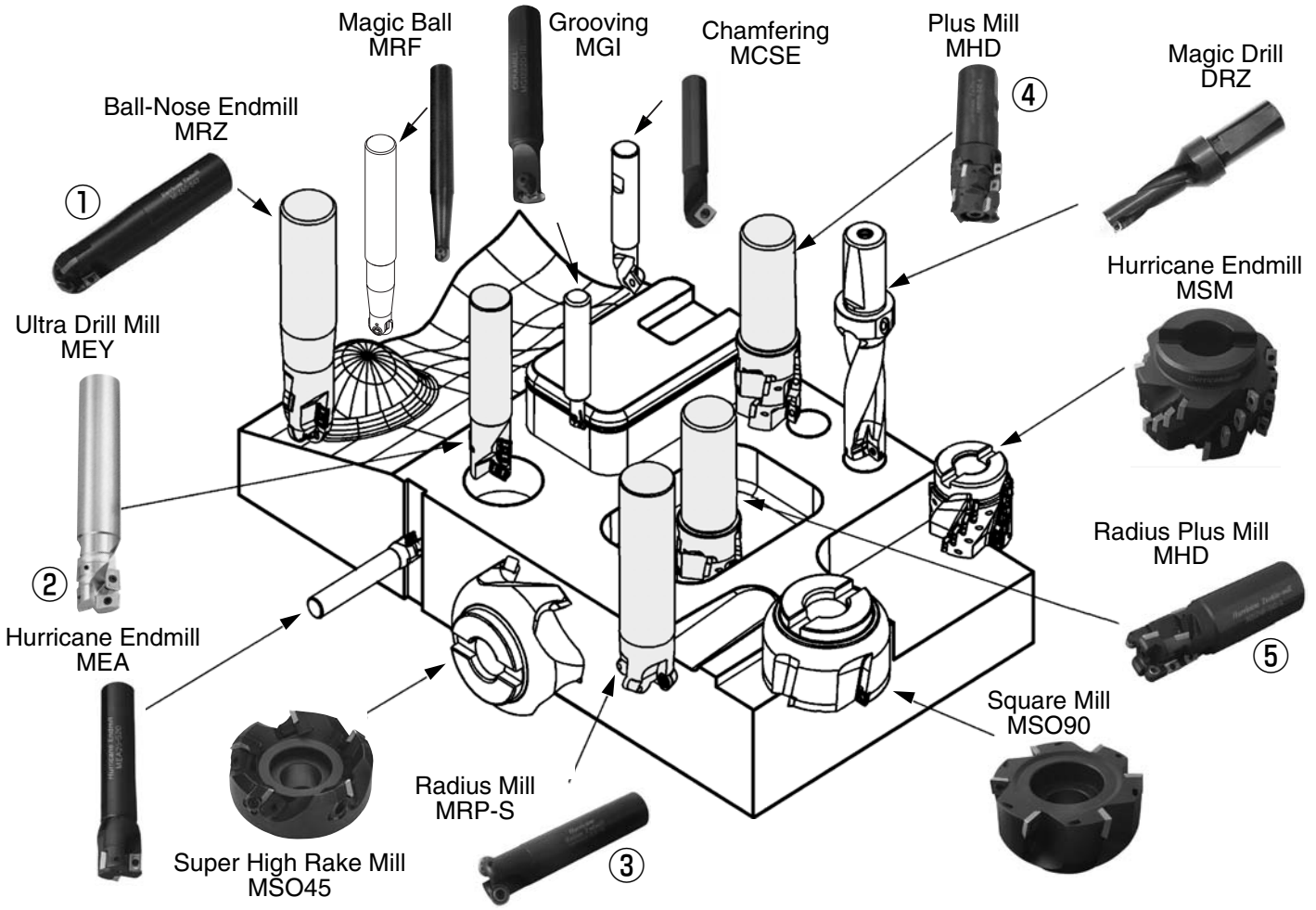


Fig.2

When using Radius Plus Mill's Front Piece, be careful for the difference of Clamp Bolt Length as mentioned above. If too long Clamp Bolt is used, the Front Piece is not fixed well, even if the Bolt is fastened. It will cause troubles to the tool and be sure to confirm the Clamp Bolt Length when installing the Front Piece.

Total Tooling



① Profiling
Ball-Nose Endmill
MRZ40-S42
RCGT40ER(PR660)
YCMT4004ER(PR660)
NEMT16T308ER-D(PR660)
N=3500min^{-1}
F=2400 mm/min

④ Shouldering
Plus Mill
MHD50-S42-SA
NDMM12T308ER-N2/N3
(PR660)
V_C=100 m/min
d×w=36×24 (1pass)
f=0.1 mm/tooth

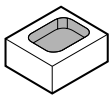
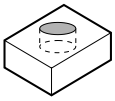
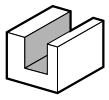
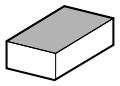
Helical Milling
Ultra Drill Mill
MEY32-S32
JOMT160408ER-D(PR830)
GOMT160408ER-D(PR830)
V_C=150 m/min
a_p=8mm
F=450 mm/min(f=0.15 mm/tooth)
②

③ Ramping
Radius Endmill
MRP050-S42-16
RPMT1606MO-H(TN100M)
V_C=180 m/min
f=0.4 mm/tooth

Pocketing+Ramping
Radius Plus Mill
MHD50-S42-6RSA
V_C=80 m/min
Depth: 36mm (18mm×2)
f=0.25 mm/tooth
Ramping Angle : 8°max
⑤

High Efficiency Machining with CERATIP

3-D Machining Endmill

Pocketing	Drilling	Shouldering	Deep Grooving	Facing
				

■ MEY

Standard (Straight)

Long Head (Straight)

Long Shank (Straight)

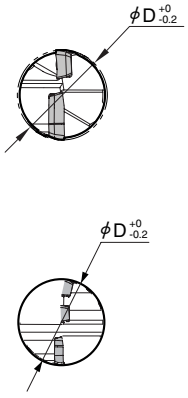
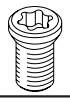


Fig.1

Fig.2

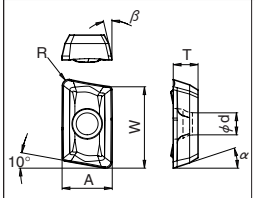
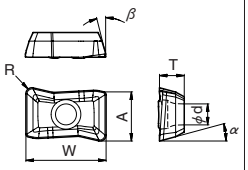
● Toolholder Dimension

Description			Stock	No. of Insert	No.of Edge Line	Dimension (mm)						Rake Angle (°)		Shape	Spare Parts			
						φD	φd	L	ℓ	S	S1	A.R.	R.R.		Clamp Screw	Wrench		Anti-seize Compound
																		
Standard (Straight)	MEY	16-S16	○	4	2	16	16	120	31	19	4.5	+11°	-11°	Fig.1	SB-2040TRG	FT-6	–	MP-1
		17-S16	○	4	2	17	16	120	31	19	4.5	+11°	-11°		SB-2040TRG	FT-6	–	
		20-S20	○	4	2	20	20	130	35	22	6	+13°	- 9°		SB-2555TRG	–	DT-8	
		21-S20	○	4	2	21	20	130	35	22	6	+13°	- 9°		SB-2555TRG	–	DT-8	
		25-S25	○	4	2	25	25	140	40	28	7.5	+13°	-11°		SB-3070TRG	–	DT-10	
		26-S25	○	4	2	26	25	140	40	28	7.5	+13°	-11°		SB-3070TRG	–	DT-10	
		32-S32	○	4	2	32	32	150	50	36	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
		33-S32	○	4	2	33	32	150	50	36	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
		40-S32	○	7	2	40	32	160	55	42	7.5	+13°	-11°	Fig.2	SB-3070TRG	–	DT-10	
		50-S42	○	7	2	50	42	170	70	54	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
Long Head (Straight)	MEY	16-S16-140H	○	4	2	16	16	140	51	19	4.5	+11°	-11°	Fig.1	SB-2040TRG	FT-6		MP-1
		20-S20-150H	○	4	2	20	20	150	53	22	6	+13°	- 9°		SB-2555TRG	–	DT-8	
		25-S25-170H	○	4	2	25	25	170	70	28	7.5	+13°	-11°		SB-3070TRG	–	DT-10	
		32-S32-180H	○	4	2	32	32	180	80	36	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
Long Shank (Straight)	MEY	16-S16-190	○	4	2	16	16	190	61	19	4.5	+11°	-11°	Fig.1	SB-2040TRG	FT-6	–	MP-1
		17-S16-190	○	4	2	17	16	190	31	19	4.5	+11°	-11°		SB-2040TRG	FT-6	–	
		20-S20-200	○	4	2	20	20	200	63	22	6	+13°	- 9°		SB-2555TRG	–	DT-8	
		21-S20-200	○	4	2	21	20	200	35	22	6	+13°	- 9°		SB-2555TRG	–	DT-8	
		25-S25-220	○	4	2	25	25	220	80	28	7.5	+13°	-11°		SB-3070TRG	–	DT-10	
		26-S25-220	○	4	2	26	25	220	40	28	7.5	+13°	-11°		SB-3070TRG	–	DT-10	
		32-S32-230	○	4	2	32	32	230	90	36	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
		33-S32-230	○	4	2	33	32	230	50	36	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	
		40-S32-240	○	7	2	40	32	240	55	42	7.5	+13°	-11°	Fig.2	SB-3070TRG	–	DT-10	
		50-S42-250	○	7	2	50	42	250	70	54	9.5	+13°	- 9°		SB-4070TRG	–	DT-15	

· S1 shows the edge length of the complete 2-flute part.

● : Std. Stock ○ : Check Availability

● Applicable Insert

JOMT...ER-D	GOMT...ER-D
	
Side Edge	Center Edge

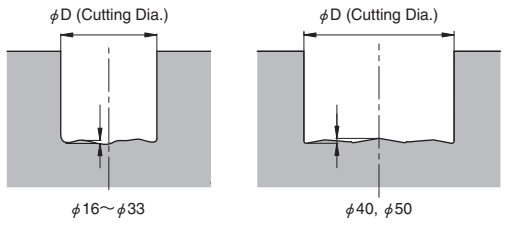
Endmill		Insert			
		Side Edge	Q'ty	Center Edge	Q'ty
MEY	16-S16(-···)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
	17-S16(-···)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
	20-S20(-···)	JOMT100308ER-D	3	GOMT100308ER-D	1
	21-S20(-···)	JOMT100308ER-D	3	GOMT100308ER-D	1
	25-S25(-···)	JOMT13T308ER-D	3	GOMT13T308ER-D	1
	26-S25(-···)	JOMT13T308ER-D	3	GOMT13T308ER-D	1
	32-S32(-···)	JOMT160408ER-D	3	GOMT160408ER-D	1
	33-S32(-···)	JOMT160408ER-D	3	GOMT160408ER-D	1
	40-S32(-···)	JOMT13T308ER-D	6	GOMT13T308ER-D	1
	50-S42(-···)	JOMT160408ER-D	6	GOMT160408ER-D	1

Description	Dimension (mm)						Angle (°)		Insert Grade													
									Cermet		PVD Coated						Carbide		Diamond			
	A	T	ϕd	W	R		α	β	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
JOMT 08T208ER-D	5.14	2.78	2.3	8.5	0.8		17°	13°							○							
100308ER-D	6.42	3.18	2.8	10.2	0.8										○							
13T308ER-D	8.05	3.70	3.4	13.2	0.8										○							
160408ER-D	9.67	4.76	4.4	16.7	0.8										○							
GOMT 08T208ER-D	5.21	2.78	2.3	8.7	0.8		13°	17°							○							
100308ER-D	6.56	3.30	2.8	10.7	0.8										○							
13T308ER-D	8.36	3.85	3.4	13.2	0.8										○							
160408ER-D	10.03	4.76	4.4	16.7	0.8										○							

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)		Recommended Grade (V_C: m/min)
	Drilling	Shouldering / Grooving	PVD Coated
			PR830
Stainless Steel (SUS304, etc)	0.08～0.12	0.05～0.15	100～180
Carbon Steel (SXXC)	0.08～0.15	0.05～0.25	120～200
Alloy Steel (SCM, etc.)	0.08～0.15	0.05～0.25	100～180
Metal Mold Steel (SKD/NAK, etc.)	0.08～0.12	0.05～0.15	80～150

◆ Bottom Shape of Drilled Hole



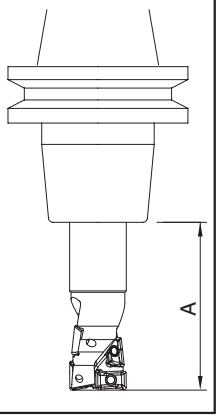
Cutting Dia.	ϕ16, ϕ17	ϕ20, ϕ21	ϕ25, ϕ26	ϕ32, ϕ33	ϕ40	ϕ50
a (mm)	0.5	0.64	0.85	1.12	1.54	1.65

3-D Machining Endmill

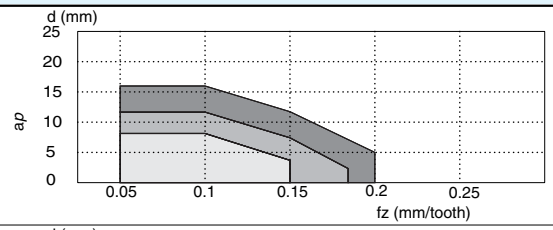
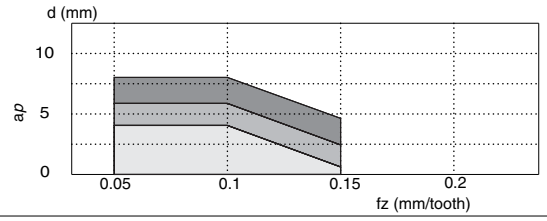
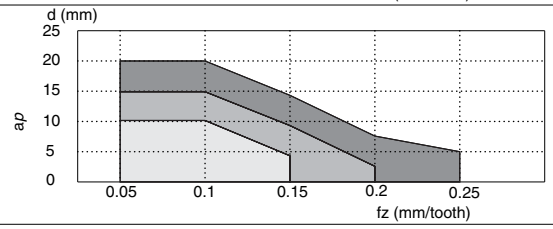
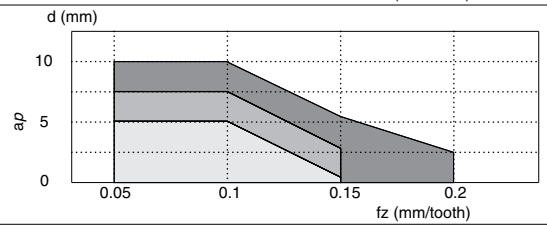
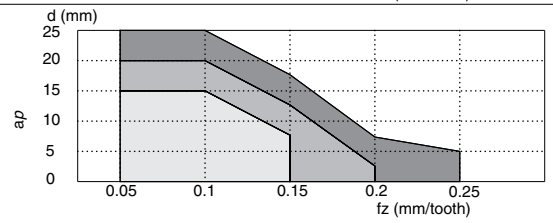
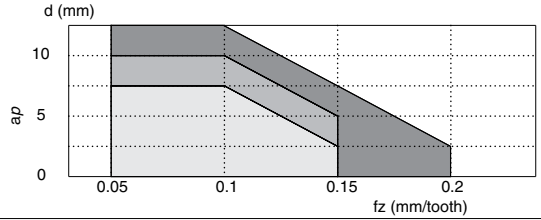
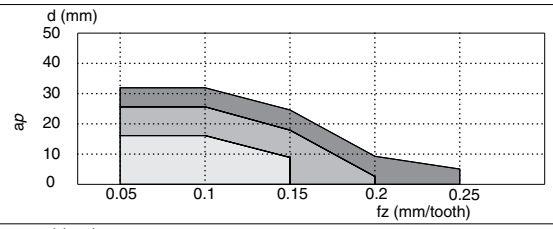
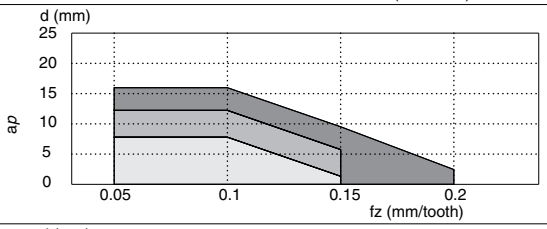
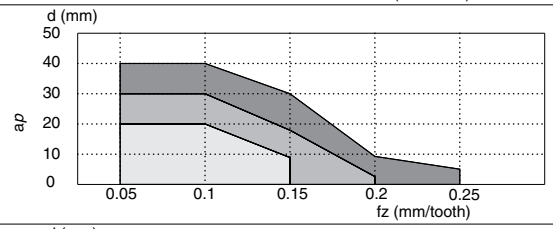
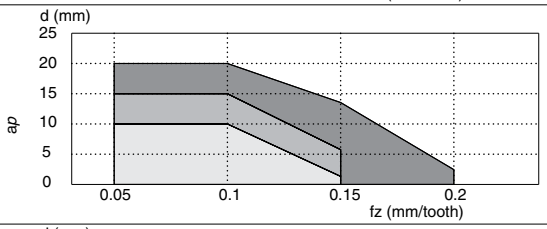
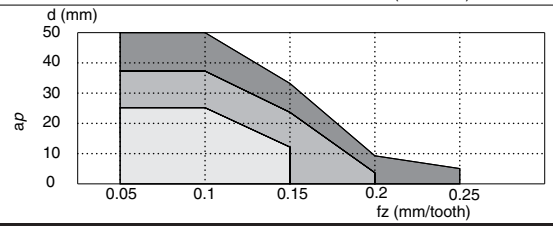
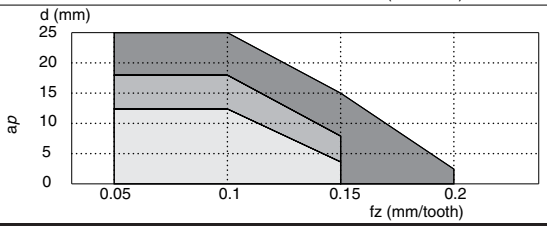
◆ Cutting Performance of Ultra Drill Mill 〈Work Material: S50C〉

Cutting Dia.	Description	Overhang Length: A (mm)		
ϕ16	MEY16-S16	31	[~61]	(N.R.)
	MEY16-S16-140H	–	~61	[~91]
	MEY16-S16-190	–	61	~91
ϕ17	MEY17-S16	31	[~61]	(N.R.)
	MEY17-S16-190	31	~61	~91
ϕ20	MEY20-S20	35	[~65]	(N.R.)
	MEY20-S20-150H	–	~65	[~95]
	MEY20-S20-200	–	65	~95
ϕ21	MEY21-S20	35	[~65]	(N.R.)
	MEY21-S20-200	35	~65	~95
ϕ25	MEY25-S25	40	[~70]	(N.R.)
	MEY25-S25-170H	–	70	[~100]
	MEY25-S25-220	–	~80	~100
ϕ26	MEY26-S25	40	[~70]	(N.R.)
	MEY26-S25-220	40	~70	~100
ϕ32	MEY32-S32	50	[~80]	(N.R.)
	MEY32-S32-180H	–	~80	[~110]
	MEY32-S32-230	–	90	~110
ϕ33	MEY33-S32	50	[~80]	(N.R.)
	MEY33-S32-230	50	~80	~110
ϕ40	MEY40-S32	55	[~85]	[~115]
	MEY40-S32-240	55	~85	~115
ϕ50	MEY50-S42	70	[~100]	[~130]
	MEY50-S42-250	70	~100	~130

Shape

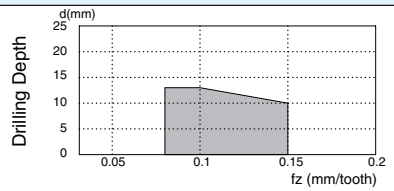


· (N.R.) means Not Recommended.
· When using in [ ] dimension, be careful that Chucking Length to the shank becomes short.

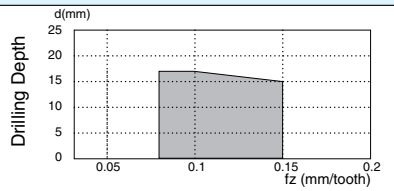
Description	■ Shouldering (Cutting Width W=ϕD/2) Part W=ϕD/4	■ Grooving ■ Ramping · Helical Milling
MEY16-S16 MEY17-S16		
MEY20-S20 MEY21-S20		
MEY25-S25 MEY26-S25		
MEY32-S32 MEY33-S32		
MEY50-S42		
MEY50-S42		

■ Drilling Depth (Standard · Long Head · Long Shank : S50C)

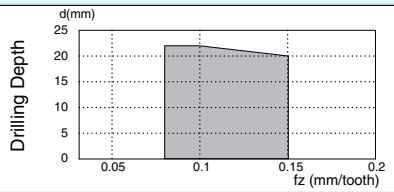
MEY16-S16
MEY17-S16



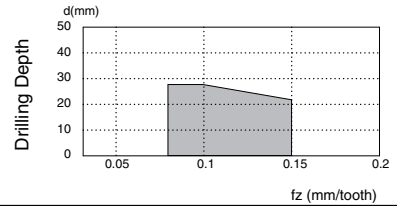
MEY20-S20
MEY21-S20



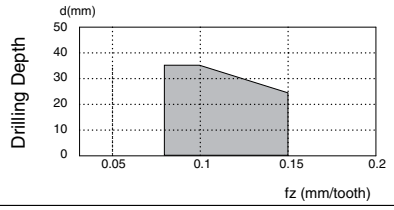
MEY25-S25
MEY26-S25



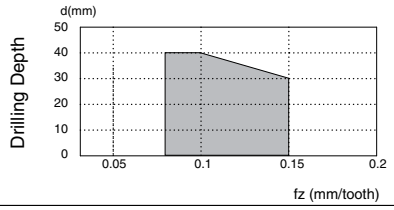
MEY32-S32
MEY33-S32



MEY40-S32



MEY50-S42



◆ How to Use Ultra Drill Mill Effectively

Drilling

- Drilling conditions shall be calculated as one Edge line.
- Use compressed air during Drilling
- Carbon Steel other than low carbon steel can be drilled to depth of 0.5D without step feed method.
  For soft steel or sticky material such as stainless steel, Step Feed Drilling (0.5-1.0mm) is recommended.
- For stainless steel drilling, Wet Cutting is recommended.
- See below table for Max. hole depth

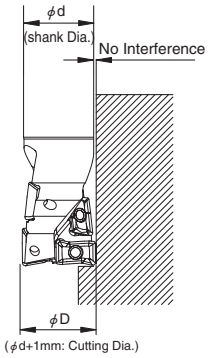
Cutting Dia.	Max. Depth
ϕ16	**13**
ϕ17	**13**
ϕ20	**17**
ϕ21	**17**
ϕ25	**22**
ϕ26	**22**
ϕ32	**29**
ϕ33	**29**

Endmilling

- Tools with larger cutting dia. by 1 mm than shank dia. are available.
  High Wall Shouldering is available.

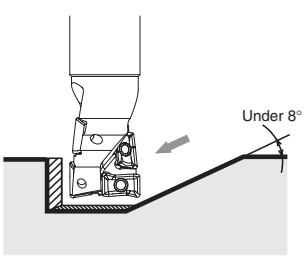
- Lineup

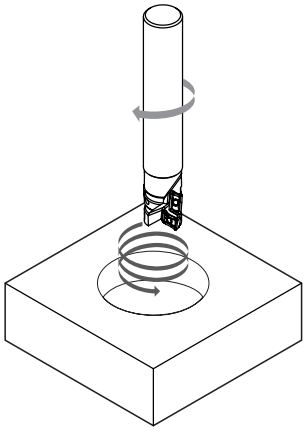
Description	ϕD	ϕd
MEY17-S16	**17**	**16**
MEY21-S20	**21**	**20**
MEY26-S25	**26**	**25**
MEY33-S32	**33**	**32**
MEY17-S16-190	**17**	**16**
MEY21-S20-200	**21**	**20**
MEY26-S25-220	**26**	**25**
MEY33-S32-230	**33**	**32**



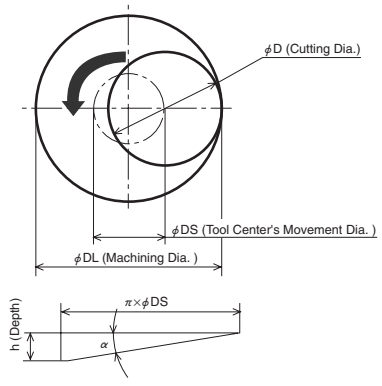
Ramping • Helical Milling

- Ramping Angle is recommended to be under 8°
- Plunge Depth per revolution at Helical Milling shall be under 1/2D.
- Use compressed air during Drilling.





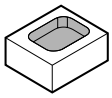
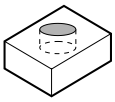
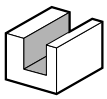
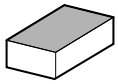
■ How to Find Factors at Helical Milling



● How to Find "ϕDS"
ϕDS=ϕDL−ϕD

● How to Find "h"
h=π×ϕDS×tanα
(α shall be under 8°)

3-D Machining Endmill

Pocketing	Drilling	Shouldering	Deep Grooving	Facing
				

■ MEZ-G

Standard (Straight)

Standard (Weldon)

Long Head (Straight)

Long Shank (Straight)

With Coolant Hole (Weldon)

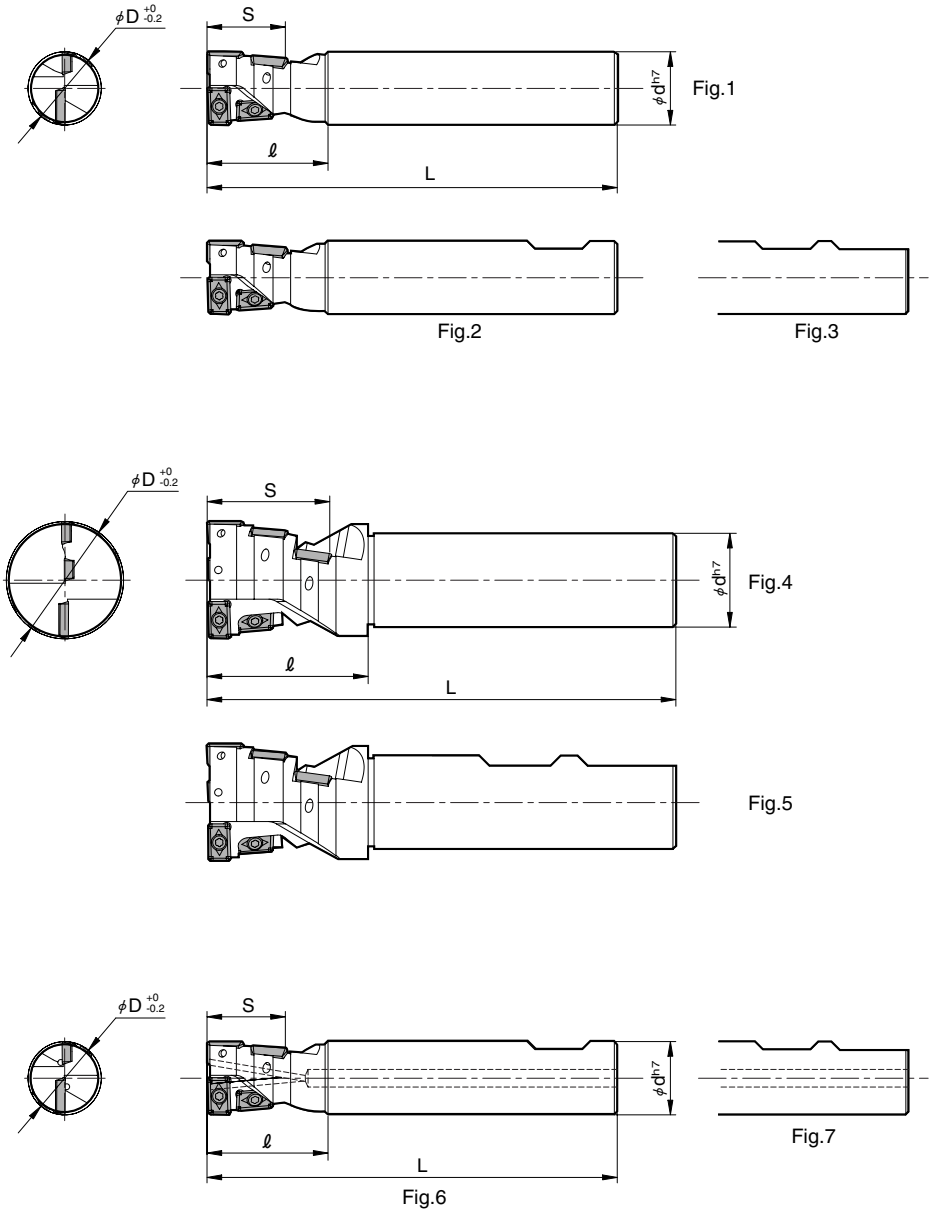


Fig.1

Fig.2

Fig.3

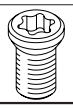
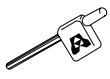
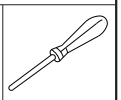
Fig.4

Fig.5

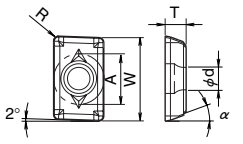
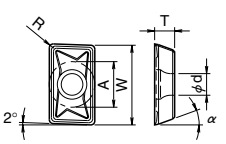
Fig.6

Fig.7

● Toolholder Dimension

Description		Stock	No. of Insert	No. of Edge Line	Dimension (mm)					Rake Angle (°)		Shape	Spare Parts		
													Clamp Screw	Wrench	
					φD	φd	L	ℓ	S	A.R.	R.R.				
Standard (Straight)	MEZ 16-S16G	●	4	2	16	16	120	31	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20G	●	4	2	20	20	130	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25G	●	4	2	25	25	140	40	25		-5°		SB-3070TRG	-	DT-10
	32-S32G	●	4	2	32	32	150	50	33		-2°		SB-4070TRG	-	DT-15
	40-S32G	●	7	2	39	32	160	55	39		-3°	Fig.4	SB-3070TRG	-	DT-10
	50-S42G	○	7	2	49	42	170	70	51		-2°		SB-4070TRG	-	DT-15
Standard (Weldon)	MEZ 16-S16-120GW	●	4	2	16	16	120	31	16	+9°	-5°	Fig.2	SB-2040TRG	FT-6	-
	20-S20-130GW	●	4	2	20	20	130	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25-140GW	●	4	2	25	25	140	40	25		-4°	Fig.3	SB-3070TRG	-	DT-10
	32-S32-150GW	●	4	2	32	32	150	50	33		-5°		SB-4070TRG	-	DT-15
	40-S32-160GW	●	7	2	39	32	160	55	39		-4°	Fig.5	SB-3070TRG	-	DT-10
	50-S40-170GW	●	7	2	49	40	170	70	51		-5°		SB-4070TRG	-	DT-15
Long Head (Straight)	MEZ 16-S16-140HG	○	4	2	16	16	140	51	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20-150HG	○	4	2	20	20	150	53	21		-4°		SB-2555TRG	-	DT-8
	25-S25-170HG	○	4	2	25	25	170	70	25		-5°		SB-3070TRG	-	DT-10
	32-S32-180HG	○	4	2	32	32	180	80	33		-2°		SB-4070TRG	-	DT-15
Long Shank (Straight)	MEZ 16-S16-190G	●	4	2	16	16	190	61	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20-200G	●	4	2	20	20	200	63	21		-4°		SB-2555TRG	-	DT-8
	25-S25-220G	●	4	2	25	25	220	80	25		-5°		SB-3070TRG	-	DT-10
	32-S32-230G	●	4	2	32	32	230	90	33		-2°		SB-4070TRG	-	DT-15
	40-S32-240G	●	7	2	39	32	240	55	39		-3°	Fig.4	SB-3070TRG	-	DT-10
	50-S42-250G	○	7	2	49	42	250	70	51		-2°		SB-4070TRG	-	DT-15
With Coolant Hole (Weldon)	MEZ 16-S16-80GW-H	●	4	2	16	16	80	31	16	+9°	-5°	Fig.6	SB-2040TRG	FT-6	-
	20-S20-85GW-H	●	4	2	20	20	85	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25-95GW-H	●	4	2	25	25	95	40	25		-4°	Fig.7	SB-3070TRG	-	DT-10
	32-S32-110GW-H	●	4	2	32	32	110	50	33		-5°		SB-4070TRG	-	DT-15

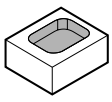
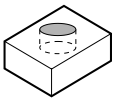
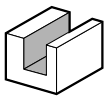
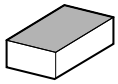
● Applicable Insert

N(D/E)MT...ER-DH	N(D/E)MT...ER-D
	
Tough Edge	Low Cutting Force

Endmill		Insert	
MEZ	16-S16(-···)	NDMT080208ER-DH	NDMT080208ER-D
	20-S20(-···)	NDMT10T208ER-DH	NDMT10T208ER-D
	25-S25(-···)	NEMT120308ER-DH	NEMT120308ER-D
	32-S32(-···)	NEMT16T308ER-DH	NEMT16T308ER-D
	40-S32(-···)	NEMT120308ER-DH	NEMT120308ER-D
	50-S42(-···)	NEMT16T308ER-DH	NEMT16T308ER-D

Description		Dimension (mm)						Angle (°)		Insert Grade													
										Cermet		PVD Coated						Carbide		Diamond			
		A	T	φd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDMT	080208ER-DH	5.086	2.38	2.2	8.5	0.8		15°		○		●		●	●			●					
	10T208ER-DH	6.276	2.78	2.8	10.2					○		●		●	●			●					
NEMT	120308ER-DH	7.669	3.18	3.4	12.7	0.8		20°		○		●		●	●			●					
	16T308ER-DH	9.254	3.97	4.4	16.2					○		●		●	●			●					
NEMT	080208ER-D	5.086	2.38	2.2	8.5	0.8		15°		○		●	○	●	●			●					
	10T208ER-D	6.276	2.78	2.8	10.2					○		●	○	●	●			●					
NEMT	120308ER-D	7.669	3.18	3.4	12.7	0.8		20°		○		●	○	●	●			●					
	16T308ER-D	9.254	3.97	4.4	16.2					○		●	○	●	●			●					

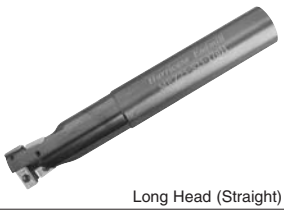
3-D Machining Endmill

Pocketing	Drilling	Shouldering	Deep Grooving	Facing
				

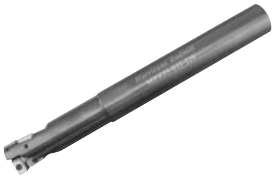
■ MEZ

Standard (Straight)

Standard (Weldon)

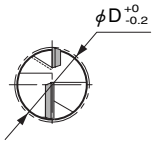


Long Head (Straight)



Long Shank (Straight)

With Coolant Hole (Weldon)



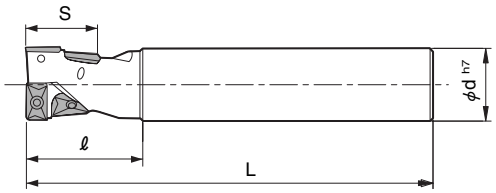


Fig.1

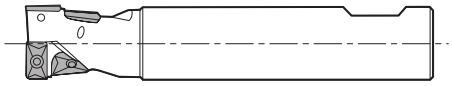
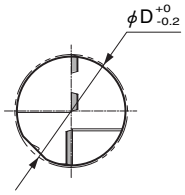


Fig.2

Fig.3



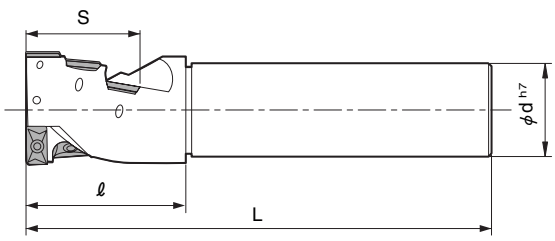


Fig.4

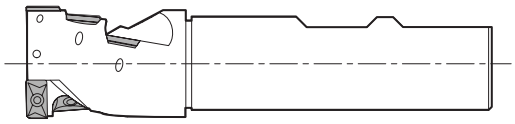
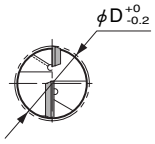


Fig.5



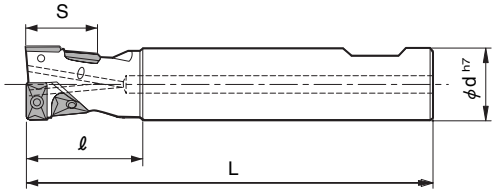
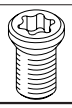
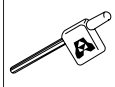
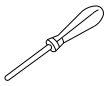


Fig.6

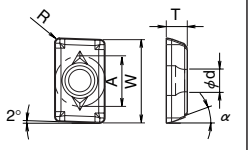
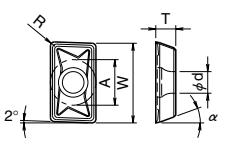
Fig.7

● : Std. Stock ○ : Check Availability

● Toolholder Dimension

Description		Stock	No. of Insert	No. of Edge Line	Dimension (mm)					Rake Angle (°)		Shape	Spare Parts		
													Clamp Screw	Wrench	
					φD	φd	L	ℓ	S	A.R.	R.R.				
Standard (Straight)	MEZ 16-S16	○	4	2	16	16	120	31	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20	○	4	2	20	20	130	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25	○	4	2	25	25	140	40	25		-5°		SB-3070TRG	-	DT-10
	32-S32	○	4	2	32	32	150	50	33		-2°		SB-4070TRG	-	DT-15
	40-S32	○	7	2	39	32	160	55	39		-3°	Fig.4	SB-3070TRG	-	DT-10
	50-S42	○	7	2	49	42	170	70	51		-2°		SB-4070TRG	-	DT-15
Standard (Weldon)	MEZ 16-S16-W	●	4	2	16	16	120	31	16	+9°	-5°	Fig.2	SB-2040TRG	FT-6	-
	20-S20-W	●	4	2	20	20	130	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25-W	●	4	2	25	25	140	40	25		-5°	Fig.3	SB-3070TRG	-	DT-10
	32-S32-W	●	4	2	32	32	150	50	33		-2°		SB-4070TRG	-	DT-15
	40-S32-W	●	7	2	39	32	160	55	39		-3°	Fig.5	SB-3070TRG	-	DT-10
	50-S40-W	●	7	2	49	40	170	70	51		-2°		SB-4070TRG	-	DT-15
Long Head (Straight)	MEZ 16-S16-140H	○	4	2	16	16	140	51	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20-150H	○	4	2	20	20	150	53	21		-4°		SB-2555TRG	-	DT-8
	25-S25-170H	●	4	2	25	25	170	70	25		-5°		SB-3070TRG	-	DT-10
	32-S32-180H	○	4	2	32	32	180	80	33		-2°		SB-4070TRG	-	DT-15
Long Shank (Straight)	MEZ 16-S16-190	●	4	2	16	16	190	61	16	+9°	-5°	Fig.1	SB-2040TRG	FT-6	-
	20-S20-200	●	4	2	20	20	200	63	21		-4°		SB-2555TRG	-	DT-8
	25-S25-220	●	4	2	25	25	220	80	25		-5°		SB-3070TRG	-	DT-10
	32-S32-230	●	4	2	32	32	230	90	33		-2°		SB-4070TRG	-	DT-15
	40-S32-240	●	7	2	39	32	240	55	39		-3°	Fig.4	SB-3070TRG	-	DT-10
	50-S42-250	○	7	2	49	42	250	70	51		-2°		SB-4070TRG	-	DT-15
With Coolant Hole (Weldon)	MEZ 16-S16-80W-H	●	4	2	16	16	80	31	16	+9°	-5°	Fig.6	SB-2040TRG	FT-6	-
	20-S20-85W-H	●	4	2	20	20	85	33	21		-4°		SB-2555TRG	-	DT-8
	25-S25-95W-H	●	4	2	25	25	95	40	25		-5°	Fig.7	SB-3070TRG	-	DT-10
	32-S32-110W-H	●	4	2	32	32	110	50	33		-2°		SB-4070TRG	-	DT-15

● Applicable Insert

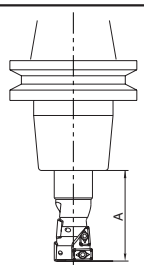
N(D/E)MT...ER-DH	N(D/E)MT...ER-D
	
Tough Edge	Low Cutting Force

Endmill		Insert	
MEZ	16-S16(----)	NDMT080208ER-DH	NDMT080208ER-D
	20-S20(----)	NDMT10T208ER-DH	NDMT10T208ER-D
	25-S25(----)	NEMT120308ER-DH	NEMT120308ER-D
	32-S32(----)	NEMT16T308ER-DH	NEMT16T308ER-D
	40-S32(----)	NEMT120308ER-DH	NEMT120308ER-D
	50-S42(----)	NEMT16T308ER-DH	NEMT16T308ER-D

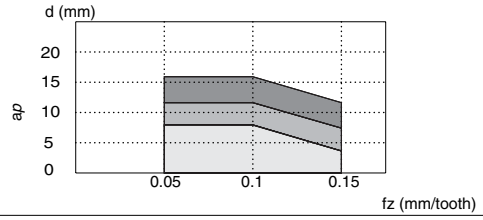
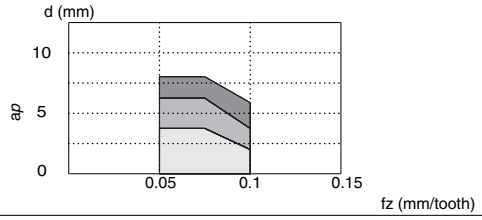
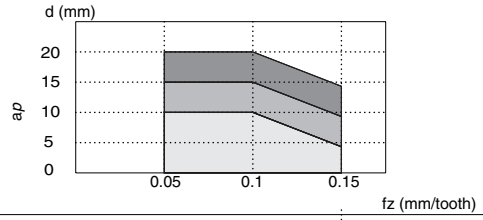
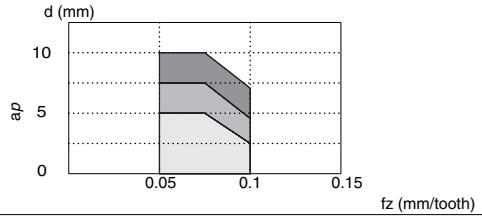
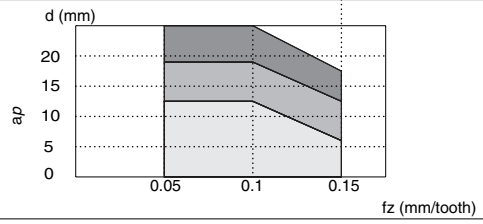
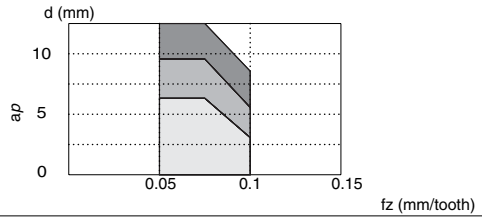
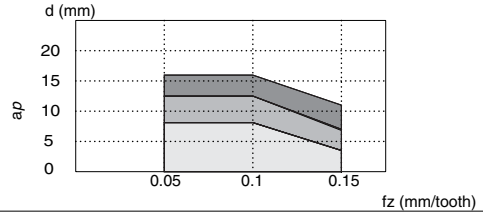
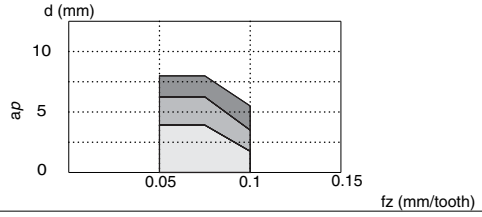
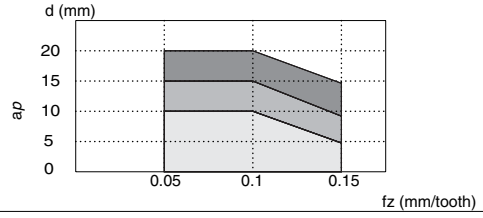
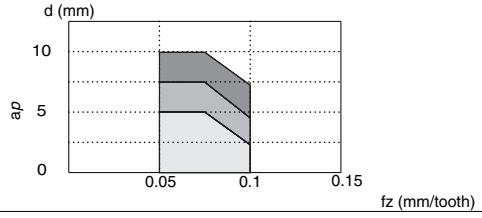
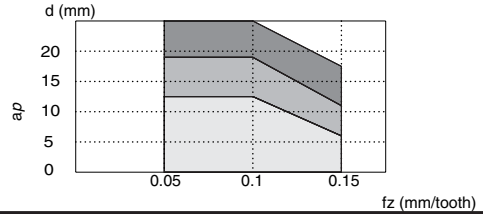
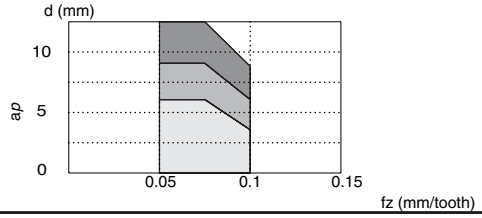
Description		Dimension (mm)						Angle (°)		Insert Grade												
										Cermet		PVD Coated						Carbide		Diamond		
		A	T	φd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDMT	080208ER-DH	5.086	2.38	2.2	8.5	0.8		15°		●		●		●	●			●					
	10T208ER-DH	6.276	2.78	2.8	10.2					●		●		●	●			●					
NEMT	120308ER-DH	7.669	3.18	3.4	12.7	0.8		20°		●		●		●	●			●					
	16T308ER-DH	9.254	3.97	4.4	16.2					●		●		●	●			●					
NEMT	080208ER-D	5.086	2.38	2.2	8.5	0.8		15°		●		●	○	●	●			●					
	10T208ER-D	6.276	2.78	2.8	10.2					●		●	○	●	●			●					
NEMT	120308ER-D	7.669	3.18	3.4	12.7	0.8		20°		●		●	○	●	●			●					
	16T308ER-D	9.254	3.97	4.4	16.2					●		●	○	●	●			●					

3-D Machining Endmill

◆ Cutting Performance of Drill Mill Silver & Drill Mill 〈Work Material: S50C〉

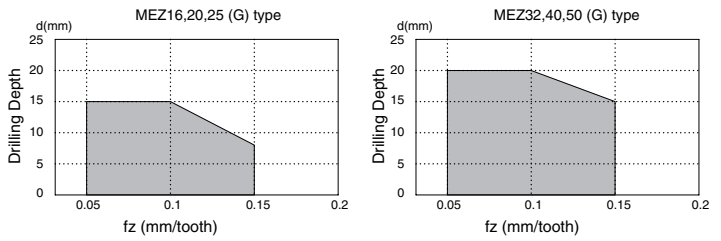
Cutting Dia.	Description	Overhang Length: A (mm)			Cutting Dia.	Description	Overhang Length: A (mm)			Shape
φ16	**MEZ16-S16(G)**	31	[~61]	(N.R.)	φ32	**MEZ32-S32(G)**	50	[~80]	(N.R.)	
	MEZ16-S16-140H(G)	-	~61	[~91]		**MEZ32-S32-180H(G)**	-	80	[~110]	
	MEZ16-S16-190(G)	-	61	~91		**MEZ32-S32-230(G)**	-	90	~110	
φ20	**MEZ20-S20(G)**	33	[~63]	(N.R.)	φ40	**MEZ40-S32**	55	[~85]	[~115]	
	MEZ20-S20-150H(G)	-	~63	[~93]		-	-	-	-	
	MEZ20-S20-200(G)	-	63	~93		**MEZ40-S32-240(G)**	55	~85	~115	
φ25	**MEZ25-S25(G)**	40	[~70]	(N.R.)	φ50	**MEZ50-S42(G)**	70	[~100]	[~130]	
	MEZ25-S25-170H(G)	-	70	[~100]		-	-	-	-	
	MEZ25-S25-220(G)	-	80	~100		**MEZ50-S42-250(G)**	70	~100	~130	

· (N.R.) means Not Recommended.
· When using in [ ] dimension, be careful that chucking length to the shank becomes short.

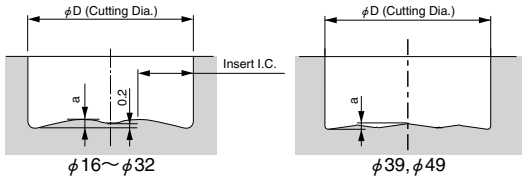
Description	■ Shouldering (Cutting Width W=φD/2) Part W=φD/4	■ Grooving ■ Ramping · Helical Milling
MEZ16-S16G MEZ16-S16		
MEZ20-S20G MEZ20-S20		
MEZ25-S25G MEZ25-S25		
MEZ32-S32G MEZ32-S32		
MEZ40-S32G MEZ40-S32		
MEZ50-S42G MEZ50-S42		

● : Std. Stock ○ : Check Availability

■ Drilling Depth (Standard · Long Head · Long Shank)



Bottom Shape of Drilled Hole (ϕ16～ϕ49)

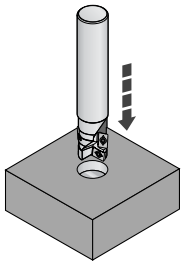


Cutting Dia.	ϕ16	ϕ20	ϕ25	ϕ32	ϕ39	ϕ49
a (mm)	0.30	0.33	0.38	0.45	0.68	0.74

◆ How to Use Drill Mill Silver (MEZ-G) and Drill Mill (MEZ) Effectively

Drilling

- Step Feed Method is recommended to cut chips short (Depth approx. 1mm).
- Drill depth is recommended to be under 0.5D. (D: Drilling Dia.)
- Use compressed air during Drilling
- PR660 is recommended for heavy usage of Drilling



Endmilling

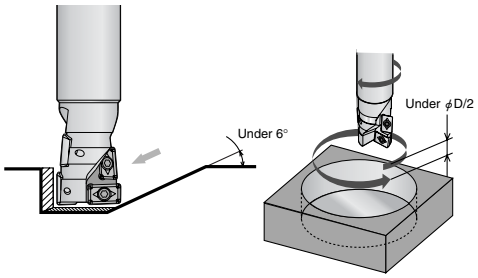
- Tough Edge Insert is recommended to high load endmilling with High f, large a*p*. If chattering happens, change the insert to low cutting force type.

N(D/E)MT...ER-DH (Tough Edge type)

N(D/E)MT...ER-D (Low Cutting Force type)

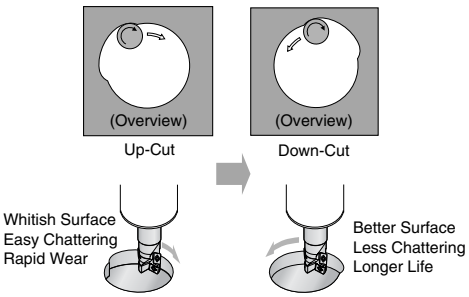
Ramping · Helical Milling

- Ramping Angle is recommended to be under 6°
- Plunge Depth per revolution at Helical Milling shall be under 1/2D.
- Use compressed air during Drilling.



Others

- Down Cut is recommended for the improvement of tool life and surface finish.
- Compressed air is recommended for smooth chip evacuation.

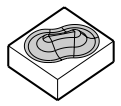
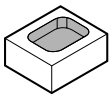


◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)		Recommended Insert Grade (V_C: m/min)									
			Cermet		PVD Coated						Carbide	
	Drilling	Shouldering Grooving	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
Stainless Steel (SUS304, etc)	0.05~0.12	0.05~0.15	☆ 120~200			☆ 120~200	★ 100~180	☆ 120~200				
Carbon Steel (SXXC)	0.05~0.2	0.05~0.2	★ 120~200			☆ 120~200	☆ 100~180	★ 120~200				
Alloy Steel (SCM, etc.)	0.05~0.2	0.05~0.2	★ 100~180			☆ 100~180	☆ 80~150	★ 100~180				
Metal Mold Steel (SKD/NAK, etc.)	0.05~0.12	0.05~0.15	★ 100~180			☆ 80~150	☆ 60~130	★ 80~150				
Cast Iron (FC/FCD, etc.)	0.05~0.2	0.05~0.2			★ 100~180						☆ 80~150	
Non-ferrous Metal (Aluminum, etc.)	0.05~0.2	0.05~0.2									★ 100~300	

· Drilling Conditions shall be calculated as one Edge line. Step Feed (0.5-0.1mm) is recommended.
· Wet Cutting is recommended at Drilling of stainless steel/cast iron
· PR660 is recommended for heavy usage of Drilling.

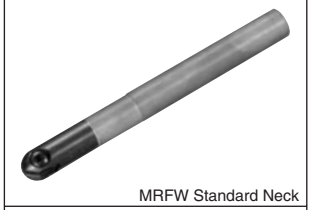
★: 1st Recommendation ☆: 2nd Recommendation

Contouring / Profiling	Pocketing
	
Finishing	Finishing

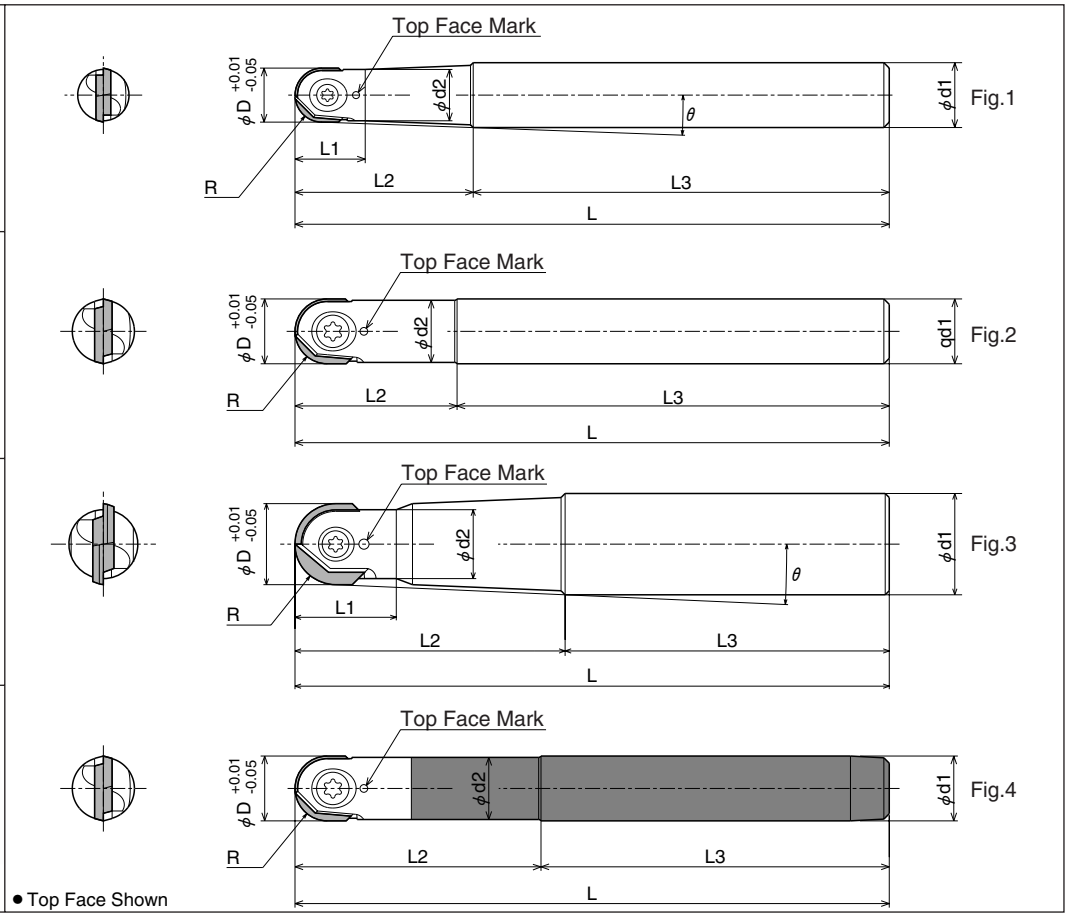
■ MRF · MRFW(Carbide Shank)


MRF Standard Neck


MRF Long Neck


MRFW Standard Neck


MRFW Long Neck



● Top Face Shown

● Toolholder Dimension

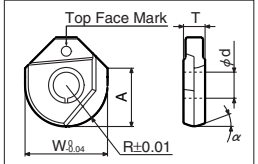
Description			Stock	No. of Insert	Dimension (mm)								θ	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Spare Parts: Anti-seize Compound	Applicable Insert
					R	φD	φd1	φd2	L	L1	L2	L3						
Standard Neck	MRF	08-S12	●	1	4	8	12	7.5	100	10	22	78	6˚20'	Fig.1	SC-30067	DT-8	MP-1	RDFG08FR
		10-S12	●	1	5	10	12	9.5	100	13	25	75	3˚	Fig.1	SC-35085	DT-10		RDFG10FR
		12-S12	●	1	6	12	12	11.5	110	–	30	80	–	Fig.2	SC-40100	DT-15		RDFG12FR
		16-S20	●	1	8	16	20	14	130	20	50	80	2˚50'	Fig.1	SC-50130	DT-20		RDFG16FR
		20-S25	●	1	10	20	25	17	140	25	60	80	3˚	Fig.3	SC-60160	TT-25		RDFG20FR
		25-S32	●	1	12.5	25	32	22	150	31	70	80	3˚30'	Fig.3	SC-60210	TT-30		RDFG25FR
Long Neck	MRF	08-S12-130	●	1	4	8	12	7.5	130	10	50	80	2˚30'	Fig.1	SC-30067	DT-8	MP-1	RDFG08FR
		10-S16-150	●	1	5	10	16	9.5	150	15	50	100	3˚50'	Fig.1	SC-35085	DT-10		RDFG10FR
		12-S16-160	●	1	6	12	16	11.5	160	16	60	100	2˚10'	Fig.1	SC-40100	DT-15		RDFG12FR
		16-S20-160	●	1	8	16	20	14	160	20	65	95	2˚	Fig.1	SC-50130	DT-20		RDFG16FR
		20-S25-180	●	1	10	20	25	17	180	25	80	100	2˚10'	Fig.3	SC-60160	TT-25		RDFG20FR
		25-S32-200	●	1	12.5	25	32	22	200	31	90	110	2˚40'	Fig.3	SC-60210	TT-30		RDFG25FR
Standard Neck	MRFW	08-S08	○	1	4	8	8	7.4	100	–	30	70	–	Fig.1	SC-30067	DT-8	MP-1	RDFG08FR
		10-S10	○	1	5	10	10	9.5	100	–	35	65	–		SC-35085	DT-10		RDFG10FR
		12-S12	○	1	6	12	12	11.5	110	–	45	65	–		SC-40100	DT-15		RDFG12FR
Long Neck	MRFW	08-S08-130	○	1	4	8	8	7.4	130	–	65	65	–	Fig.1	SC-30067	DT-8	MP-1	RDFG08FR
		10-S10-140	○	1	5	10	10	9.5	140	–	75	65	–		SC-35085	DT-10		RDFG10FR
		12-S12-150	○	1	6	12	12	11.5	150	–	85	65	–		SC-40100	DT-15		RDFG12FR

· θ (Toolholder's interference angle) is the angle formed by the tangential line from insert dia. to toolholder's shank dia.

● : Std. Stock ○ : Check Availability

● Applicable Insert

RDFG...FR



● Top Face Shown

Description		Dimension (mm)						Angle (°)		Insert Grade				
										PVD Coated				
		A	T	φd	W	R		α		PR510	PR630	PR660	PR730	PR915
RDFG	08FR	6.6	2.1	3.1	8.0	4		15°						●
	10FR	8.0	2.7	3.6	10.0	5		15°						●
	12FR	9.4	3.2	4.1	12.0	6		15°						●
	16FR	11.3	4.2	5.1	16.0	8		10°						●
	20FR	14.1	5.2	6.1	20.0	10		10°						●
	25FR	15.5	6.2	6.1	25.0	12.5		10°						●

● **Confirm the Top Face Mark of both insert and toolholder**

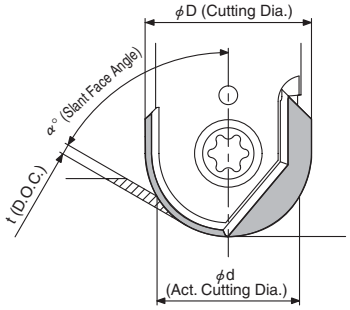
◆ Recommended Cutting Conditions (At Tool's Biggest Dia.)

Work Material	Insert Grade	Vc (m/min)	fz (mm/tooth)	φ8		φ10		φ12	
				Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)	Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)	Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)
Carbon Steel (SxxC)	PR915	100～200	0.1～0.3	150 (5970)	0.2 (2930)	150 (4770)	0.2 (1190)	150 (3980)	0.2 (1590)
Alloy Steel (SCM, etc.)	PR915	80～180	0.1～0.3	130 (5170)	0.2 (2070)	130 (4140)	0.2 (1660)	130 (3450)	0.2 (1380)
Metal Mold Steel (SKD/NAK, etc.) under 45HRC	PR915	50～150	0.1～0.2	100 (3980)	0.15 (1190)	100 (3180)	0.15 (950)	100 (2650)	0.15 (800)
Cast Iron (FC/FCD, etc.)	PR915	100～200	0.2～0.4	150 (5970)	0.3 (3580)	150 (4770)	0.3 (2860)	150 (3980)	0.3 (2390)
Stainless Steel (SUS304, etc)	PR915	50～150	0.1～0.2	100 (3980)	0.15 (1190)	100 (3180)	0.15 (950)	100 (2650)	0.15 (800)
Work Material	Insert Grade	Vc (m/min)	fz (mm/tooth)	φ16		φ20		φ25	
				Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)	Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)	Vc (m/min) (n: min^{-1})	fz (mm/tooth) (fv: mm/min)
Carbon Steel (SxxC)	PR915	100～200	0.1～0.3	150 (2980)	0.2 (1190)	150 (2390)	0.2 (950)	150 (1910)	0.2 (760)
Alloy Steel (SCM, etc.)	PR915	80～180	0.1～0.3	130 (2950)	0.2 (1030)	130 (2070)	0.2 (830)	130 (1660)	0.2 (660)
Metal Mold Steel (SKD/NAK, etc.) under 45HRC	PR915	50～150	0.1～0.2	100 (1990)	0.15 (600)	100 (1590)	0.15 (480)	100 (1270)	0.15 (380)
Cast Iron (FC/FCD, etc.)	PR915	100～200	0.2～0.4	150 (2980)	0.3 (1790)	150 (2390)	0.3 (1430)	150 (1910)	0.3 (1150)
Stainless Steel (SUS304, etc)	PR915	50～150	0.1～0.2	100 (1990)	0.15 (600)	100 (1590)	0.15 (480)	100 (1270)	0.15 (380)

◆ Actual V_C Conversion Coefficient Table

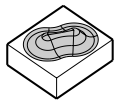
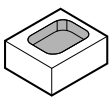
The actual V_C varies depending on a*p* and slant face angle.

The actual V_C can be obtained by dividing the conversion coefficient into the recommended cutting speed.

Model	Cutting Dia. (φD)		φ8		φ10		φ12	
	a*p* (t: mm)		0.1	0.2	0.1	0.2	0.2	0.5
	Slant Face Angle (α°)	15°	1.00	1.00	1.00	1.00	1.00	1.00
		30°	1.05	1.02	1.05	1.03	1.04	1.01
		45°	1.18	1.12	1.20	1.14	1.16	1.07
		60°	1.47	1.34	1.51	1.38	1.42	1.24
		75°	2.15	1.82	2.24	1.92	2.02	1.60
		90° (Horizontal Plane)	4.48	3.22	5.06	3.57	3.92	2.50
	Cutting Dia. (φD)		φ16		φ20		φ25	
	a*p* (t: mm)		0.2	0.5	0.5	1	0.5	1
	Slant Face Angle (α°)	15°	1.00	1.00	1.00	1.02	1.00	1.01
		30°	1.05	1.01	1.02	1.00	1.03	1.00
		45°	1.18	1.10	1.12	1.06	1.14	1.08
		60°	1.47	1.30	1.34	1.21	1.38	1.25
		75°	2.14	1.73	1.83	1.53	1.93	1.62
		90° (Horizontal Plane)	4.48	2.87	3.20	2.29	3.57	2.55

e.g.: Suppose tool dia. 8mm, a*p* 0.1mm, slant face angle 90°, The actual cutting speed Vd for carbon steel machining, when the V_C is 150m/min at the biggest diameter, Vd can be obtained as Vd=150 4.48=33.5m/min

Ball-Nose Endmill

Contouring / Profiling	Pocketing
	
Finishing	Finishing

■ MRZ

Standard (Straight)

Standard (Weldon)

Standard (Combination)

Standard (MK)

Long Shank (Straight)

Long Shank (Combination)

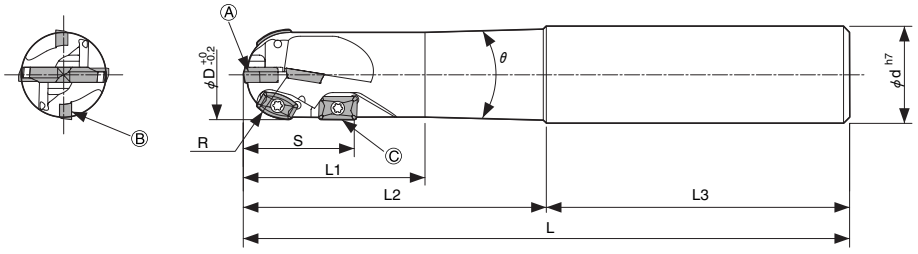


Fig.1

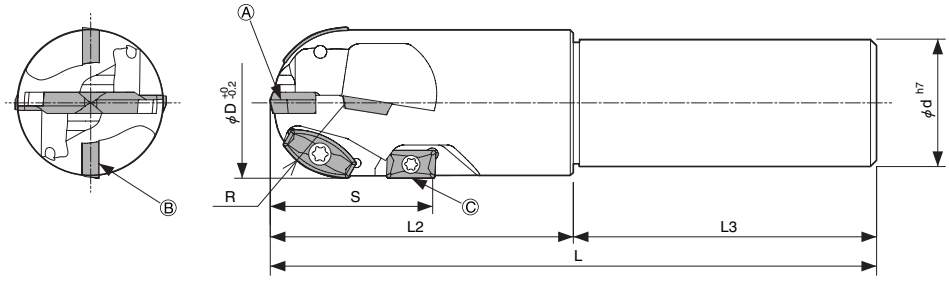


Fig.2

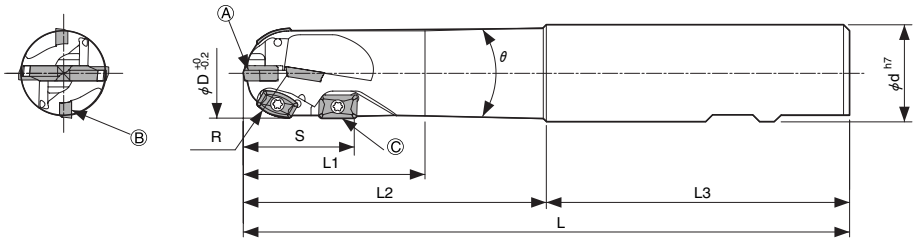


Fig.3

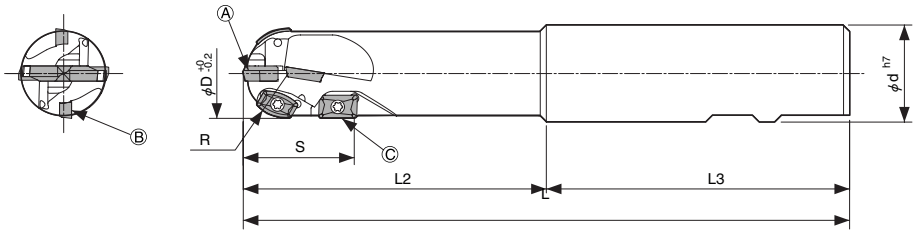


Fig.4

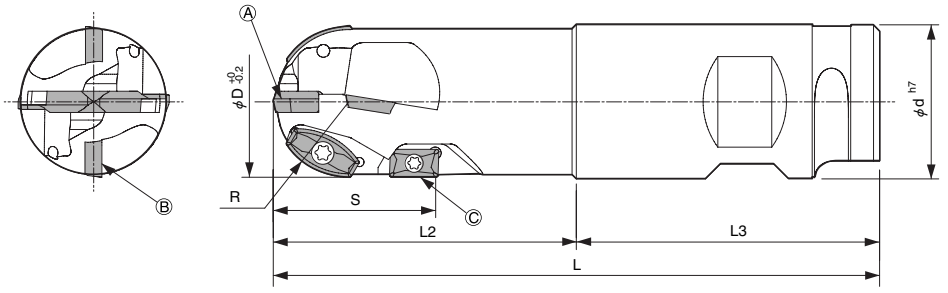


Fig.5

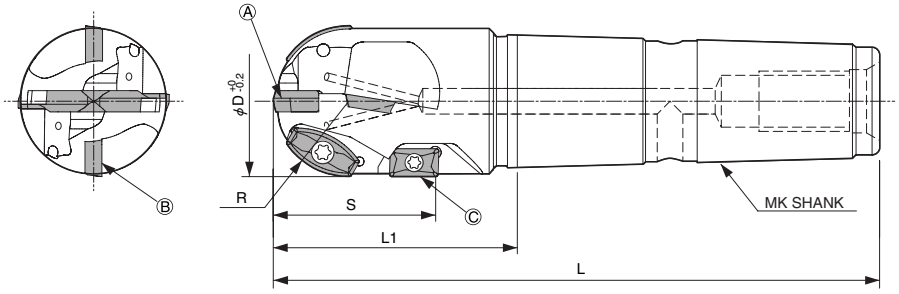


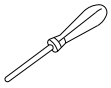
Fig.6

● : Std. Stock ○ : Check Availability

● Toolholder Dimension

Description		Stock	Dimension (mm)									Angle (°)	Shape
			R	φD	φd	L	L1	L2	L3	S		θ	
Standard (Straight)	MRZ 30S-S32	●	15	30	32	160	50	80	80	25		7.5°	Fig.1
	30-S32	●	15	30	32	200	60	100	100	36		5°	
	MRZ 40-S42	●	20	40	42	200	70	100	100	48		7.5°	
	MRZ 50-S42	●	25	50	42	200	-	100	100	53		-	Fig.2
Standard (Weldon)	MRZ 30S-W32	○	15	30	32	160	50	80	80	25		7.5°	Fig.3
	30-W32	○	15	30	32	200	60	100	100	36		5°	
	MRZ 30-S32-W	●	15	30	32	130	-	70	60	36		-	Fig.4
	MRZ 40-S40-W	●	20	40	40	145	-	75	70	48			
Standard (Combination)	MRZ 50-C508	○	25	50	50.8	200	-	100	100	53		-	Fig.5
	50-S50.8-CS		25	50	50.8	155	-	75	80	53			
Standard (MK)	MRZ 32-164-MK4	●	16	32	-	164	62	-	-	36		-	Fig.6
	32-194-MK4	●	16	32	-	194	92	-	-	36			
	MRZ 40-172-MK4	●	20	40	-	172	70	-	-	48			
	40-212-MK4	●	20	40	-	212	110	-	-	48			
	MRZ 50-204-MK5	●	25	50	-	204	75	-	-	53			
	50-244-MK5	●	25	50	-	244	115	-	-	53			
Long Shank (Straight)	MRZ 30-S32-350	○	15	30	32	350	60	100	250	36		5°	Fig.1
	MRZ 40-S42-350	○	20	40	42	350	-	150	200	48		-	
Long Shank (Combination)	MRZ 50-C508-250	○	25	50	50.8	250	-	150	100	53		-	Fig.5

● Spare Parts

Description	Clamp Screw			Wrench		
						
	For Nose Insert	For Side Insert	For Straight insert	For Nose Insert	For Side Insert	For Straight insert
MRZ 30S-S32 30-S32	SB-3060TRG	SB-3080TR	SB-3080TR	DT-10	DT-10	DT-10
MRZ 40-S42	SB-4065TR	SB-4085TR	SB-4085TR	DT-15	DT-15	DT-15
MRZ 50-S42	SB-4085TR	SB-5090TR	SB-4085TR	DT-15	DT-20	DT-15
MRZ 30S-W32 30-W32	SB-3060TRG	SB-3080TR	SB-3080TR	DT-10	DT-10	DT-10
MRZ 30-S32-W	SB-3060TRG	SB-3080TR	SB-3080TR	DT-10	DT-10	DT-10
MRZ 40-S40-W	SB-4065TR	SB-4085TR	SB-4085TR	DT-15	DT-15	DT-15
MRZ 50-C508 50-S50.8-CS	SB-4085TR	SB-5090TR	SB-4085TR	DT-15	DT-20	DT-15
MRZ 32-164-MK4 32-194-MK4	SB-3060TRG	SB-3080TR	SB-3080TR	DT-10	DT-10	DT-10
MRZ 40-172-MK4 40-212-MK4	SB-4065TR	SB-4085TR	SB-4085TR	DT-15	DT-15	DT-15
MRZ 50-204-MK5 50-244-MK5	SB-4085TR	SB-5090TR	SB-4085TR	DT-15	DT-20	DT-15
MRZ 30-S32-350	SB-3060TRG	SB-3080TR	SB-3080TR	DT-10	DT-10	DT-10
MRZ 40-S42-350	SB-4065TR	SB-4085TR	SB-4085TR	DT-15	DT-15	DT-15
MRZ 50-C508-250	SB-4085TR	SB-5090TR	SB-4085TR	DT-15	DT-20	DT-15

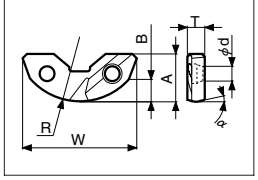
● Applicable Insert

Endmill	Insert		
	Nose R Insert	Side R Insert	Straight Edge Insert
MRZ30S-····	Ⓐ: RCGT30ER 1pc	Ⓑ: YCMT30T3ER 2pcs	Ⓒ: NEMT120308ER-D(H) 1pcs
MRZ30-····	Ⓐ: RCGT30ER 1pc	Ⓑ: YCMT30T3ER 2pcs	Ⓒ: NEMT120308ER-D(H) 3pcs
MRZ32-····	Ⓐ: RCGT32ER 1pc	Ⓑ: YCMT32T3ER 2pcs	Ⓒ: NEMT120308ER-D(H) 3pcs
MRZ40-····	Ⓐ: RCGT40ER 1pc	Ⓑ: YCMT4004ER 2pcs	Ⓒ: NEMT16T308ER-D(H) 3pcs
MRZ50-····	Ⓐ: RCGT50ER 1pc	Ⓑ: YCMT5005ER 2pcs	Ⓒ: NEMT16T308ER-D(H) 3pcs

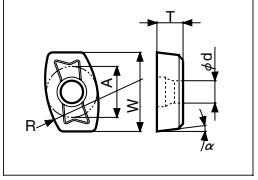
Ball-Nose Endmill MRZ

● Applicable Insert

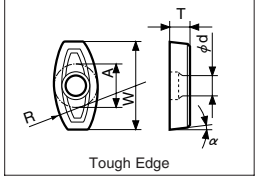
RCGT...ER



YCMT...ER

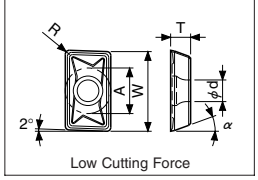


YCMT...ER-H



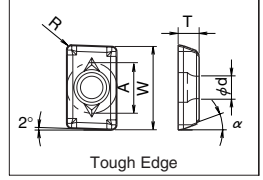
Tough Edge

NEMT...ER-D



Low Cutting Force

NEMT...ER-DH



Tough Edge

Description		Dimension (mm)						Angle (°)		Insert Grade													
										Cermet		PVD Coated						Carbide		Diamond			
		A	T	ϕd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
RCGT	30ER	11.5	5.0	3.4	26.6	15		7°						●	●			●					
	32ER	11.5	5.0	3.4	27.6	16									●								
	40ER	14.0	6.0	4.4	34.6	20								●	○			●					
	50ER	15.0	7.0	4.4	41.3	25								●	○			○					
YCMT	30T3ER	7.74	3.97	3.4	12.0	15		7°						●	●			●					
	32T3ER	7.94	3.97	3.4	13.2	16									●								
	4004ER	9.88	4.76	4.4	18.0	20								●	○			●					
	5005ER	11.90	5.56	5.5	24.0	25								●	○			○					
	5005ER-H	11.90	5.56	5.5	24.0	25								○	○			○					
NEMT	120308ER-D	7.669	3.18	3.4	12.7	0.8		20°		○		●	○	●	●			●					
	16T308ER-D	9.254	3.97	4.4	16.2	0.8				○		●	○	●	●			●					
NEMT	120308ER-DH	7.669	3.18	3.4	12.7	0.8				○		●		●	●			●					
	16T308ER-DH	9.254	3.97	4.4	16.2	0.8				○		●		●	●			●					

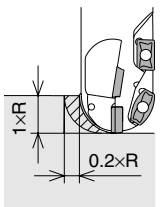
◆ Recommended Cutting Conditions

Work Material	f (mm/tooth)		Recommended Insert Grade (V_C: m/min)									
			Cermet		PVD Coated						Carbide	
	Side Machining	Grooving	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
Stainless Steel (SUS304, etc)	0.08~0.2	0.08~0.25					★ 100~180	☆ 120~200				
Carbon Steel (SXXC)	0.15~0.6	0.2~0.5					☆ 100~180	★ 130~250				
Alloy Steel (SCM, etc.)	0.15~0.6	0.2~0.5					☆ 100~180	★ 130~250				
Metal Mold Steel (SKD/NAK, etc.) under 35HRC	0.1~0.5	0.15~0.4					☆ 80~180	★ 120~200				
Metal Mold Steel (SKD/NAK, etc.) under 45HRC	0.07~0.15	0.1~0.2					☆ 60~80	★ 80~100				
Cast Iron (FC/FCD, etc.)	0.15~0.6	0.2~0.5									★ 150~300	

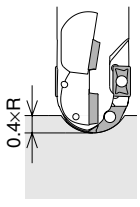
· V_C and f in the above table are based on the conditions below.
When machining at the larger a*p*, reduce the f.

★: 1st Recommendation ☆: 2nd Recommendation

Side Machining



Grooving

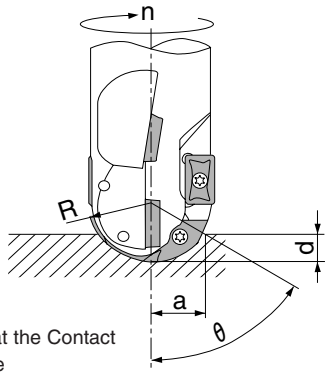


"R" Indicates the R-dimension of the Nose-R insert (RCGT···).

· V_C and Spindle Revolution of Ball-Nose Endmill

$$Va = \frac{2\times\pi\times\sqrt{a(2R-d)}\times n}{1000}$$

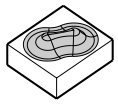
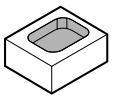
$$n = \frac{1000\times Va}{2\times\pi\times\sqrt{a(2R-d)}}$$



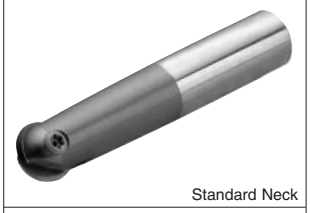
R : Ball Radius (mm)
a : Radius of the Circle at the Contact Point to Work Surface
d : a*p* (mm)
Va : V_C at Point "a" (m/min)
n : Revolution (min-1)

● : Std. Stock ○ : Check Availability

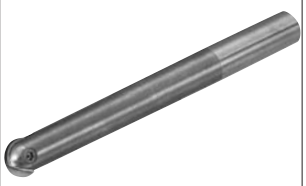
CBN Ball-Nose Endmill

Contouring / Profiling	Pocketing
 Finishing	 Finishing

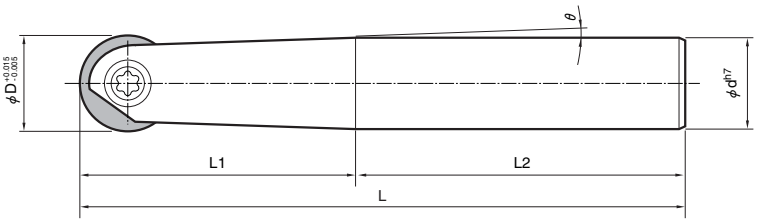
■ MHM



Standard Neck



Long Neck

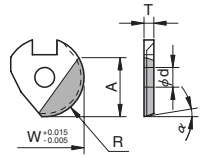


● Toolholder Dimension

Description			Stock	No. of Insert	Dimension (mm)						θ	Spare Parts		Applicable Insert
					R	φD	φd	L	L1	L2		Clamp Screw	Wrench	
Standerd Neck	MHM	12Y1	●	2	6	12	12	81	36	45	1°90"	SB-1403TR	DT-15	RY1200
		16Y1	●	2	8	16	16	96	48	48	1°40"	SB-1404TR	DT-20	RY1600
		20Y1	●	2	10	20	20	110	60	50	1°20"	SB-1405TR	DT-20	RY2000
Long Neck	MHM	12Y2	●	2	6	12	12	131	81	50	0°80"	SB-1403TR	DT-15	RY1200
		16Y2	●	2	8	16	16	163	108	55	0°60"	SB-1404TR	DT-20	RY1600
		20Y2	●	2	10	20	20	190	140	50	0°50"	SB-1405TR	DT-20	RY2000

● Applicable Insert

RY...



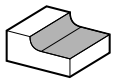
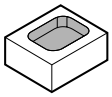
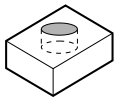
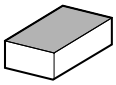
Description		Dimension (mm)						Angle (°)		Insert Grade CBN					
		A	T	φd	W	R		α		KBN10B	KBN25B	KBN65B	KBN900	KBN22Y	KBN62Y
RY	1200	9.0	1.8	3.5	12.0	6		8°						●	●
	1600	12.0	2.0	4.0	16.0	8								●	●
	2000	14.0	2.5	5.0	20.0	10								●	●

◆ Recommended Cutting Conditions

Work Material	ap (mm)	fz (mm/tooth)	Insert Grade (V_C: m/min) CBN					
			KBN10B	KBN25B	KBN65B	KBN9000	KBN22Y	KBN62Y
Alloy Steel (SCM, etc.)	0.2~0.4	0.15~0.40						★ 800~1800
Gray Cast Iron (FC, etc.)	0.2~0.5	0.15~0.40						★ 1200~1600
Ductile Cast Iron (FCD, etc.)	0.2~0.4	0.15~0.30						★ 800~1800
High Hard Mat'l 35-50HRC	0.1~0.7	0.15~0.60					★ 1000~2500	
High Hard Mat'l 58-64HRC	0.1~0.2	0.15~0.40					★ 600~1600	

★: 1st Recommendation ☆: 2nd Recommendation

Radius Endmill [RDMT / RPMT Insert]

Curved Facing	Pocketing	Drilling	Facing
			

■ MRP-S

Standard (Straight)

Standard (Welden)

Long Shank (Straight)

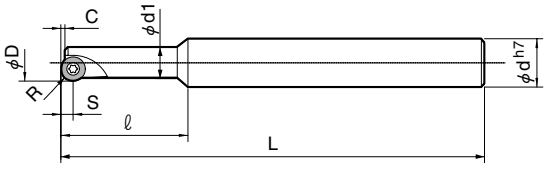


Fig.1

Fig.2

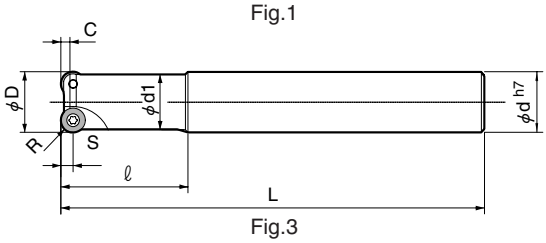


Fig.3

Fig.4

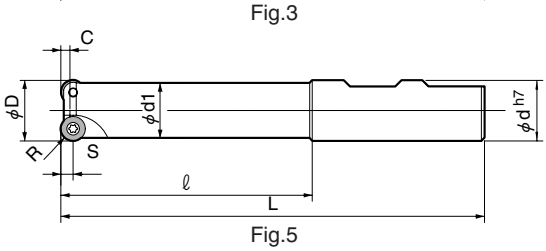


Fig.5

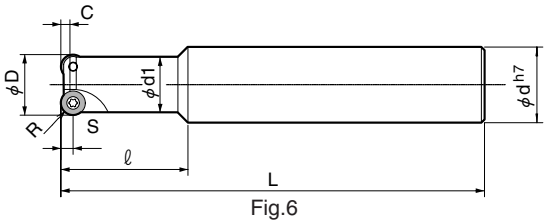


Fig.6

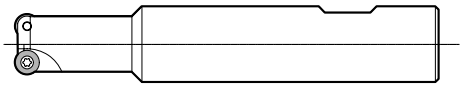


Fig.7

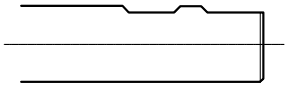


Fig.8

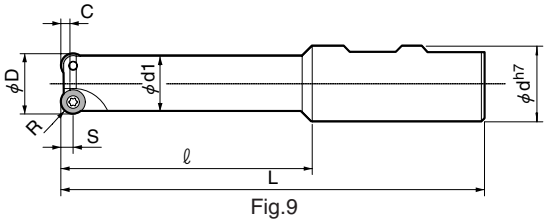


Fig.9

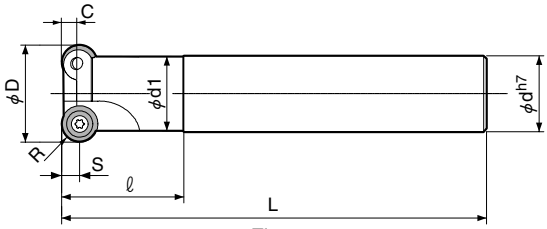


Fig.10

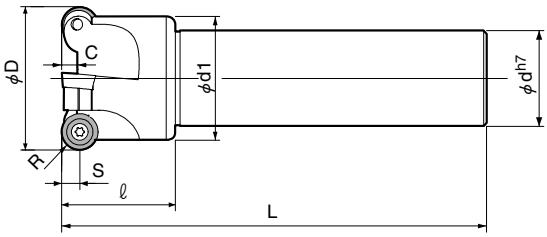


Fig.11

● : Std. Stock ○ : Check Availability

● Toolholder Dimension

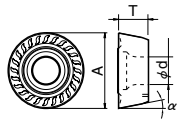
	Description		Stock	No. of Insert	Dimension (mm)									Rake Angle (°)		Shape	Spare Parts		Applicable Insert
					R	φD	φd	φd1	L	ℓ	C	Pd	S	A.R.	R.R.		Clamp Screw	Wrench	
Standard (Straight)	MRP	012-S16-08 NEW	○	1	4	12	16	10.4	110	40	3.0	N.A.	4	-8.5°	-5.5°	Fig.1	SB-3060TR	DT-10	RDMT08T2M0-H
		016-S16-08 NEW	○	2	4	16	16	14.4	110	40	3.0	0.5	4	0°	-5.5°	Fig.3			
		020-S20-08 NEW	○	2	4	20	20	17.0	120	40	3.0	2.0	4	+5°	-4°				
	MRP	025-S25-10-3T NEW	○	3	5	25	25	21.0	120	40	3.5	2.5	5	+2°	-6°	Fig.3	SB-3080TR	DT-10	RPMT10T3M0
		032-S32-10-4T NEW	○	4	5	32	32	28.0	140	40	3.5	2.5	5	+2°	-6°				
	MRP	032-S25-12	○	2	6	32	25	24.4	140	40	5.0	4.0	6	+5°	-4°	Fig.10	SB-4085TR	DT-15	RPMT1204M0-H RPMT1204M0
		040-S32-12	○	3	6	40	32	31.4	160	40	5.0	4.0	6	+5°	-5°				
		040-S32-12-4T NEW	○	4	6	40	32	31.4	140	40	4.5	3.5	6	+5°	-5°				
		050-S42-12	○	4	6	50	42	41.4	170	40	5.0	4.0	6	+5°	-5°		SB-40115TR		
	MRP	040-S32-16	○	2	8	40	32	31.4	160	40	7.0	6.0	8	+5°	-3°	Fig.10	SB-50120TR	DT-20	RPMT1606M0-H
		050-S42-16	○	3	8	50	42	41.4	170	40	7.0	6.0	8	+5°	-3°				
		063-S42-16	○	4	8	63	42	54.4	170	50	7.0	6.0	8	+5°	-3°	Fig.11			
Standard (Weldon)	MRP	012-W16-1T042-90	●	1	4	12	16	-	90	42	3.0	2.0	4.0	-8.5°	-5.5°	Fig.2	SB-3060TR	DT-10	RDMT08T2M0-H
		012-W16-1T042-130	●	1	4	12	16	-	130	42	3.0	2.0	4.0	-8.5°	-5.5°				
		016-W16-2T042-90	●	2	4	16	16	-	90	42	3.0	2.0	4.0	0°	-5.5°	Fig.4			
		016-W20-2T042-132	●	2	4	16	20	-	132	42	3.0	2.0	4.0	0°	-5.5°	Fig.7			
		016-W25-2T042-183	●	2	4	16	25	-	183	42	3.0	2.0	4.0	0°	-5.5°	Fig.8			
		020-W20-2T042-92	●	2	4	20	20	-	92	42	3.0	2.0	4.0	+5°	-4°	Fig.4			
		020-W25-2T082-138	●	2	4	20	25	-	138	82	3.0	2.0	4.0	+5°	-4°	Fig.9			
		020-W25-2T082-183	●	2	4	20	25	-	183	82	3.0	2.0	4.0	+5°	-4°				
	MRP	025-W32-3T082-142	●	3	5	25	32	21	142	82	3.5	2.5	5.0	+2°	-6°	Fig.9	SB-3080TR	DT-10	RPMT10T3M0
		025-W32-3T127-187	●	3	5	25	32	21	187	127	3.5	2.5	5.0	+2°	-6°				
		032-W32-4T082-142	●	4	5	32	32	28	142	82	3.5	2.5	5.0	+2°	-6°	Fig.5			
		032-W32-4T127-187	●	4	5	32	32	28	187	127	3.5	2.5	5.0	+2°	-6°				
Long Shank (Straight)	MRP	012-S16-08-160 NEW	○	1	4	12	16	10.4	160	40	3.0	N.A.	4	-8.5°	-5.5°	Fig.1	SB-3060TR	DT-10	RDMT08T2M0-H
		016-S16-08-160 NEW	○	2	4	16	16	14.4	160	40	3.0	0.5	4	0°	-5.5°	Fig.3			
		020-S20-08-180 NEW	○	2	4	20	20	17.0	180	40	3.0	2.0	4	+5°	-4°				
	MRP	025-S25-10-3T-180 NEW	○	3	5	25	25	21.0	180	40	3.5	2.5	5	+2°	-6°	Fig.3	SB-3080TR	DT-10	RPMT10T3M0
		032-S32-10-4T-200 NEW	○	4	5	32	32	28.0	200	40	3.5	2.5	5	+2°	-6°				
	MRP	032-S25-12-300	○	2	6	32	25	24.4	300	40	5.0	4.0	6	+5°	-4°	Fig.10	SB-4085TR	DT-15	RPMT1204M0-H RPMT1204M0
		040-S32-12-300	○	3	6	40	32	31.4	300	40	5.0	4.0	6	+5°	-5°				
		040-S32-12-4T-200 NEW	○	4	6	40	32	31.4	200	40	4.5	3.5	6	+5°	-5°				
		050-S42-12-300	○	4	6	50	42	41.4	300	40	5.0	4.0	6	+5°	-5°		SB-40115TR		
	MRP	040-S32-16-300	○	2	8	40	32	31.4	300	40	7.0	6.0	8	+5°	-3°	Fig.10	SB-50120TR	DT-20	RPMT1606M0-H
		050-S42-16-300	○	3	8	50	42	41.4	300	40	7.0	6.0	8	+5°	-3°				
		063-S42-16-300	○	4	8	63	42	54.4	300	50	7.0	6.0	8	+5°	-3°	Fig.11			

· Pd : Max. *ap* at Drilling

Radius Endmill

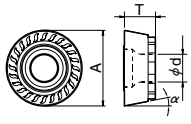
● Applicable Insert

RDMT08T2M0-H



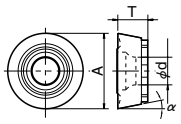
Tough Edge

RPMT...-H



Tough Edge

RPMT...

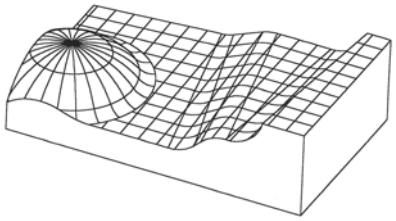


Low Cutting Force

Endmill	Insert	
MRP····-08	RDMT08T2M0-H	-
MRP····-10	-	RPMT10T3M0
MRP····-12	RPMT1204M0-H	RPMT1204M0
MRP····-16	RPMT1606M0-H	-

Description		Dimension (mm)					Angle (°)		Insert Grade													
									Cermet			PVD Coated						Carbide		Diamond			
		A	T	ϕd	W	R	α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
RDMT	08T2M0-H	8.0	2.78	3.4	-	-	15°		●		●		○	●			○					
RPMT	10T3M0	10.0	3.97	3.4	-	-	11°		●		●		●	●			○					
RPMT	1204M0-H	12.0	4.76	4.4	-	-	11°		●		●		●	●			○					
	1204M0										●		●	●			○					
RPMT	1606M0-H	16.0	6.35	5.5	-	-	11°		●		●		●	●			○					

Any Curved Facing Available



Top Face

Low Cutting Force and Good Chip Evacuation by New Chipbreaker Design. "H" type insert has a land at cutting edge and secured the sufficient edge strength.

New ratchet design prevents the insert's movement and holds the insert firmly on the insert pocket even at the heavy machining.

Bottom Face

Insert	Land at Edge	Feature	Remarks
FPMT090340ER RPMT10T3M0 RPMT1204M0	No	Low Cutting Force (Suitable for Radius Plus Mill)	Radius Plus Mill It has long cutting edge and normally low cutting force insert is used. Radius Endmill, Radius Face Mill In case that work's clamp is weak, work is thin or small M/C is used, sharp cutting performance and less chatteing is obtained.
RPMT08T2M0-H RPMT1204M0-H RPMT1606M0-H RPMT2006M0-H	Parallel Land of 0.2mm Width	Tough Edge (Suitable for Radius Endmill/Radius Face Mill)	Radius Endmill, Radius Face Mill Used in General Roughing. Radius Plus Mill Used in the machining which requires strong edge such as heavy interrupted cutting.

◆ Recommended Cutting Conditions

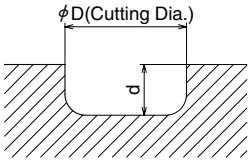
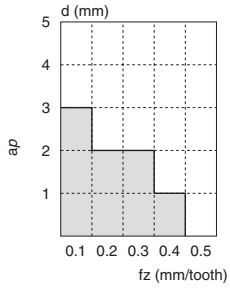
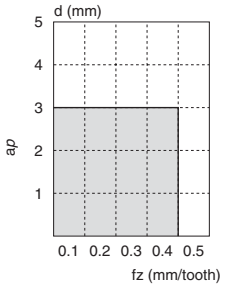
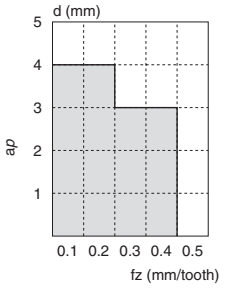
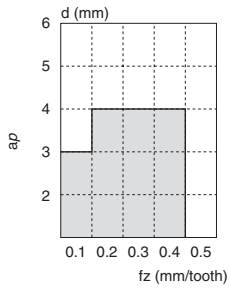
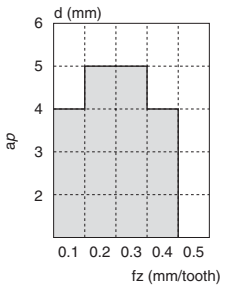
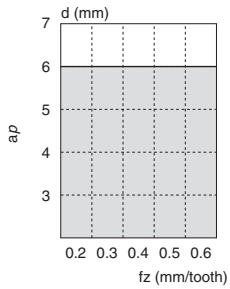
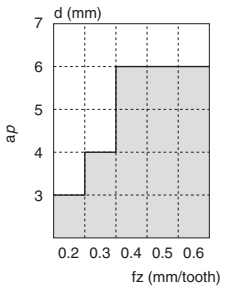
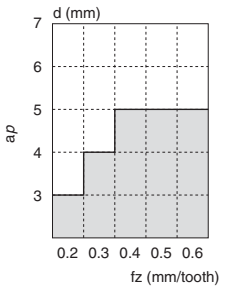
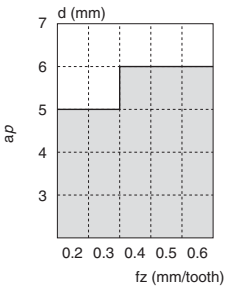
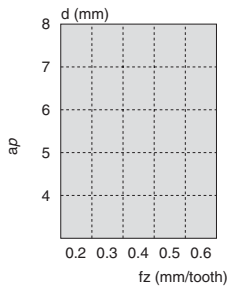
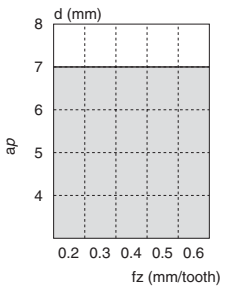
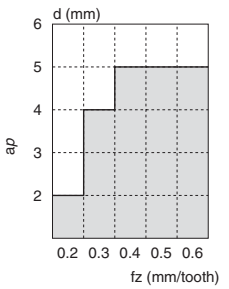
Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min)													
		Cermet		PVD Coated						Carbide		Diamond			
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304, etc)	~0.25	☆ 120~200				★ 100~180	☆ 120~200								
Carbon Steel (SXXC)	~0.3	★ 120~200				☆ 100~180	★ 120~200								
Alloy Steel (SCM, etc.)	~0.3	★ 100~180				☆ 80~150	★ 100~180								
Metal Mold Steel (SKD/NAK, etc.)	~0.25	★ 100~180				☆ 60~130	★ 80~150								
Cast Iron (FC/FCD, etc.)	~0.3			★ 100~180						☆ 80~150					
Non-ferrous Metal (Aluminum, etc.)	~0.4									★ 100~300					

·Reduce the a*p* by 20-50% at the machining with long overhang length or using long shank type

★: 1st Recommendation ☆: 2nd Recommendation

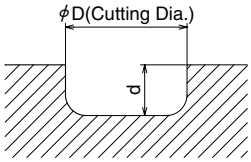
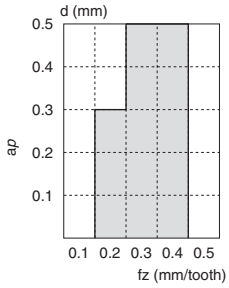
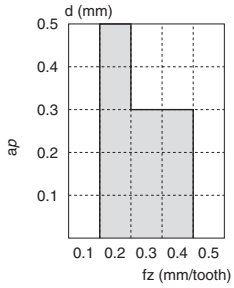
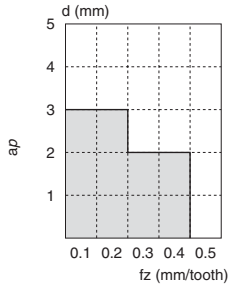
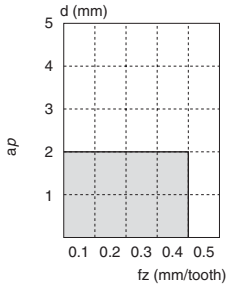
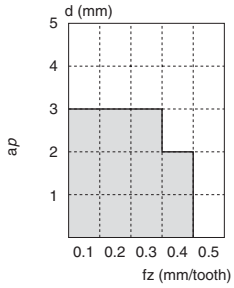
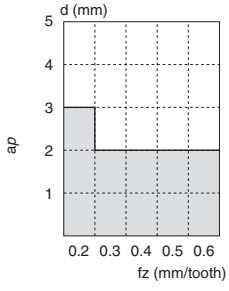
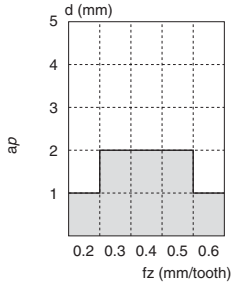
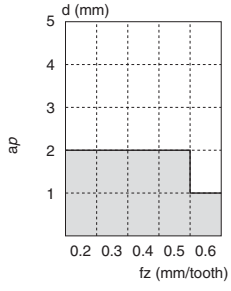
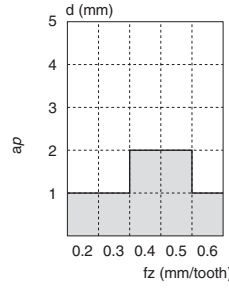
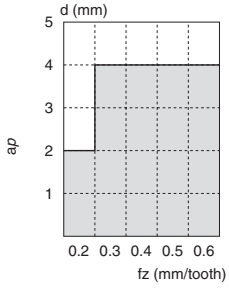
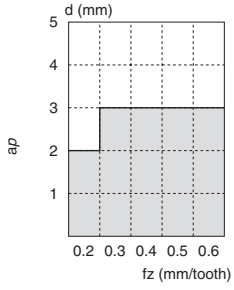
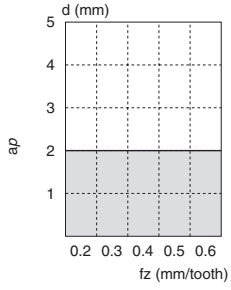
● : Std. Stock ○ : Check Availability

◆ Cutting Performance of Radius Mill (Standard-type)

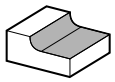
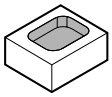
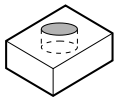
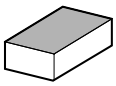
Work Material	Grooving			
S50C	 ● Cutting Conditions Tooholder: Standard V_C=120～150m/min (See below table) a*p*=varied f=varied Dry Overhang Length = L_1			
Insert				
08 Type (RDMT08T2MO-H)	MRP012-S16-08 n=3980min^{-1}(V=150) L_1=42mm	MRP016-S16-08 n=2980min^{-1}(V=150) L_1=42mm	MRP020-S20-08 n=2390min^{-1}(V=150) L_1=42mm	
				
10 Type (RPMT10T3M0)	MRP025-S25-10-3T n=1910min^{-1}(V_C=150) L_1=60mm	MRP032-S32-10-4T n=1490min^{-1}(V_C=150) L_1=80mm		
				
12 Type (RPMT1204M0-H)	MRP032-S25-12 n=1490min^{-1}(V_C=150) L_1=80mm	MRP040-S32-12 n=1195min^{-1}(V_C=150) L_1=80mm	MRP040-S32-12-4T n=1195min^{-1}(V_C=150) L_1=80mm	MRP050-S42-12 n=765min^{-1}(V_C=120) L_1=80mm
				
16 Type (RPMT1606M0-H)	MRP040-S32-16 n=1195min^{-1}(V_C=150) L_1=90mm	MRP050-S42-16 n=765min^{-1}(V_C=120) L_1=90mm	MRP063-S42-16 n=605min^{-1}(V_C=120) L_1=90mm	
				

Radius Endmill MRP-S

◆ Cutting Performance of Radius Mill (Long Shank type)

Work Material	Grooving
S50C	 ● Cutting Conditions Tooholder: Standard V_C=120～150m/min (See below table) a*p*=varied f=varied Dry Overhang Length = L_1
Insert	
08 Type (RDMT08T2MO-H)	MRP012-S16-08-160 n=3980min^{-1}(V_C=150) L_1=80mm  MRP016-S16-08-160 n=2980min^{-1}(V_C=150) L_1=80mm  MRP020-S20-08-180 n=2390min^{-1}(V_C=150) L_1=90mm 
10 Type (RPMT10T3M0)	MRP025-S25-10-3T-180 n=1910min^{-1}(V_C=150) L_1=90mm  MRP032-S32-10-4T-200 n=1490min^{-1}(V_C=150) L_1=100mm 
12 Type (RPMT1204M0-H)	MRP032-S25-12-300 n=1490min^{-1}(V_C=150) L_1=150mm  MRP040-S32-12-300 n=1195min^{-1}(V_C=150) L_1=150mm  MRP040-S32-12-4T-200 n=1195min^{-1}(V_C=150) L_1=100mm  MRP050-S42-12-300 n=765min^{-1}(V_C=120) L_1=150mm 
16 Type (RPMT1606M0-H)	MRP040-S32-16-300 n=1195min^{-1}(V_C=150) L_1=150mm  MRP050-S42-16-300 n=765min^{-1}(V_C=120) L_1=150mm  MRP063-S42-16-300 n=605min^{-1}(V_C=120) L_1=150mm 

Radius Endmill [RPMT Insert]

Curved Facing	Pocketing	Drilling	Facing
			

■ MRP-SC

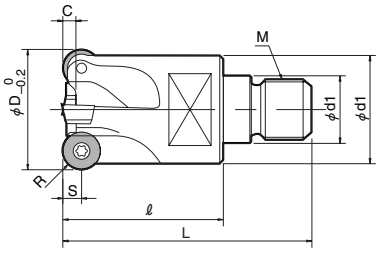


Fig.1

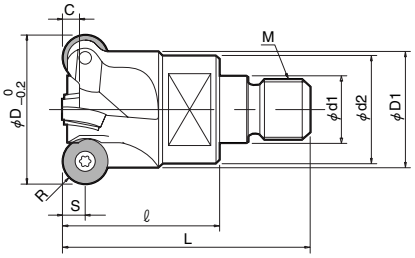


Fig.2

● Toolholder Dimension

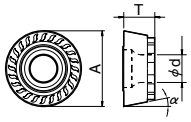
Applicable Adapter P.385

Description	Stock	No. of Insert	Dimension (mm) R	φD	φD1	φd1	φd2	L	ℓ	C	Pd	M	S	Rake Angle (°) A.R.	R.R.	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Applicable Insert
MRP 025R-SC	●	3	5	25	21.0	12.5	-	57	35	3.5	2.5	M12	5.0	+2°	-6°	Fig.1	**SB-3080TR**	**DT-10**	RPMT10T3M0
032R-SC	●	4	5	32	29.0	17.0	-	67	43	3.5	2.5	M16	5.0						
040R-SC	●	4	6	40	31	17.0	29	67	43	4.5	3.5	M16	6.0	+5°	-5°	Fig.2	**SB-4085TR**	**DT-15**	RPMT1204M0 RPMT1204M0-H

· Pd : Max. D.O.C. at Drilling

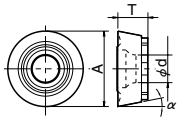
● Applicable Insert

RPMT...-H



Tough Edge

RPMT...



Low Cutting Force

Description	Dimension (mm) A	T	φd	W	R		Angle (°) α		Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
RPMT 10T3M0	10.0	3.97	3.4	-	-		11°		●		●		●	●			○					
RPMT 1204M0	12.0	4.76	4.4	-	-		11°		●		●		●	●			○					
1204M0-H	12.0	4.76	4.4	-	-						●		●	●			○					

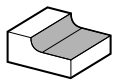
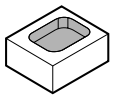
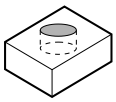
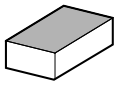
◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C: m/min) Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30	Diamond KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304, etc)	~0.25	☆ 120~200				★ 100~180	☆ 120~200								
Carbon Steel (SXXC)	~0.3	★ 120~200				☆ 100~180	★ 120~200								
Alloy Steel (SCM, etc.)	~0.3	★ 100~180				☆ 80~150	★ 100~180								
Metal Mold Steel (SKD/NAK, etc.)	~0.25	★ 100~180				☆ 80~130	★ 80~150								
Cast Iron (FC/FCD, etc.)	~0.30			★ 100~180						☆ 80~150					
Non-ferrous Metal (Aluminum, etc.)	~0.40									★ 100~300					

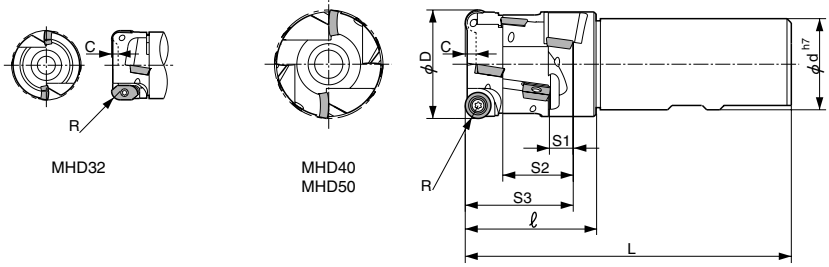
★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

Radius Helical Endmill

Curved Facing	Pocketing	Drilling	Facing
			

■ MHD-RSA Separate-type (Base Unit A + Front Piece + Radius Front Piece)



● Toolholder Dimension

Description	Stock	No. of Insert		No. of Edge Line	Dimension (mm)										Rake Angle (°)	
		Bottom Edge	Middle Edge		R	φD	φd	L	ℓ	C	S1	S2	S3		A.R.	R.R. Bottom Edge	R.R. Middle Edge
MHD 32-S32-4RSA	●	2	8	2	4	32	32	133	50	3.0	8.3	24.7	42.0		+9°	-5°	-7°
40-S32-5RSA	○	2	8	2	5	40	32	143	58	4.0	10.9	31.9	48.2			-3°	-3°
40-S42-5RSA	●	2	8	2	5	40	42	149	58	4.0	10.9	31.9	48.2			-3°	-3°
50-S42-6RSA	○	2	8	2	6	50	42	150	59	5.0	10.9	31.9	48.2			0°	-1°

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Applicable Insert and Composition of Toolholder

Endmill	Applicable Insert ➡ P.429		Base Unit ➡ P.396	Front Piece (Middle) ➡ P.397	Front Piece (End) ➡ P.430
	Bottom Edge	Middle Edge			
MHD 32-S32-4RSA	FPMR090340ER	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2	MHD32-S32-A	MHD32-F	MHD32-4RF
40-S32-5RSA **40-S42-5RSA**	RPMT10T3M0	NDMM12T308ER-T/N2/N3	MHD40-S32-A MHD40-S42-A	MHD40-F	MHD40-5RF
50-S42-6RSA	RPMT1204M0 RPMT1204M0-H	NDMM12T308ER-T/N2/N3	MHD50-S42-A	MHD50-F	MHD50-6RF

■ MHD-RC Integral type

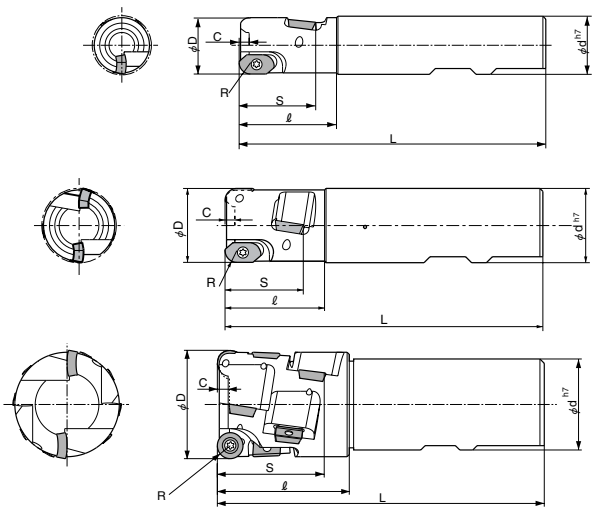


Fig.1

Fig.2

Fig.3

● Toolholder Dimension

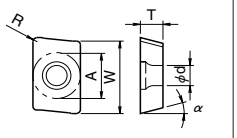
Description	Stock	No. of Insert		No. of Edge Line	Dimension (mm)							Rake Angle (°)			Shape	Applicable Insert ➡ P.429	
		Bottom Edge	Middle Edge		R	φD	φd	L	ℓ	C	S	A.R.	R.R. Bottom Edge	R.R. Middle Edge		Bottom Edge	Middle Edge
MHD 20-S20-4RC	○	1	2	1	4	20	20	106	33.5	3	25.8	+9°	-9°	-7°	Fig.1	FPMT090340ER	NDKW090304ER NDKT0903○○(E/T)R-V
25S-S25-4RC	○	2	2	1	4	25	25	106	33.5	3	25.8		-7°	-3°	Fig.2		
32-S32-5RC	○	2	8	2	5	32	32	126	46	4	38.0		-5°	-7°	Fig.3	RPMT10T3M0	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2
40-S32-5RC	○	2	8	2	5	40	32	139	58	4	48.3		-3°	-3°		RPMT1204M0	NDMM12T308ER-T/N2/N3
50-S42-6RC	○	2	8	2	6	50	42	150	59	5	49.3		0°	-1°		RPMT1204M0 RPMT1204M0-H	NDMM12T308ER-T/N2/N3

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

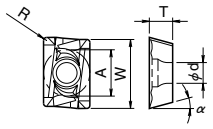
● : Std. Stock ○ : Check Availability

● Applicable Insert

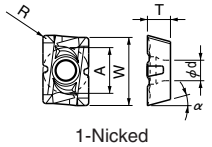
NDKW...ER



NDKT...(E/T)R-V

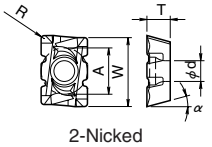


NDKT...ER-N1



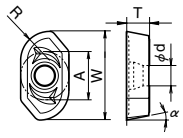
1-Nicked

NDKT...ER-N2

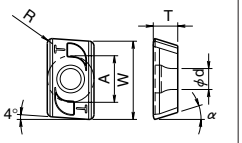


2-Nicked

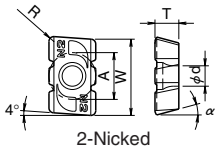
FPMT...ER



NDMM...ER-T

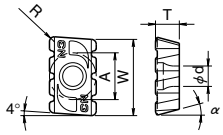


NDMM...ER-N2



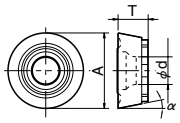
2-Nicked

NDMM...ER-N3



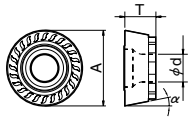
3-Nicked

RPMT...



Low Cutting Force

RPMT...-H



Tough Edge

Description		Dimension (mm)						Angle (°)		Insert Grade													
										Cermet		PVD Coated						Carbide		Diamond			
		A	T	ϕd	W	R		α		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
NDKW	090304ER	6.35	3.18	2.8	9.5	0.4		15°		○		○		○	○			●					
NDKT	090304ER-V	6.35	3.18	2.8	9.5	0.4		15°		●		●	○	●	●			●					
	090304TR-V													●	●								
	090308ER-V					0.8						●		●	●								
NDKT	090304ER-N1	6.35	3.18	2.8	9.5	0.4		15°		○		○	○	●	○			○					
	090304ER-N2									○		●	○	●	●			○					
NDMM	12T308ER-T	7.58	3.97	3.4	12.7	0.8		15°		●		●		●	●			●					
	12T308ER-N2	7.79								●		●		●	●			●					
	12T308ER-N3	7.79								●		●		●	●			●					
FPMT	090340ER	6.64	3.18	2.8	9.2	4.0		11°				●		●	○			○					
RPMT	10T3M0	10.0	3.97	3.4	-	5		11°		●		●		●	●			○					
	1204M0	12.0	4.76	4.4	-	6						●		●	●			○					
	1204M0-H	12.0	4.76	4.4	-	6				●		●		●	●			○					

IMPORTANT: See P. 402-403 for Nicked Insert's installation

◆ Recommended Cutting Conditions (MHD-RSA type)

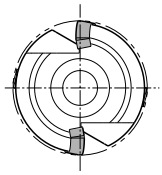
Application	Description	Work Material: S50C				Work Material: FC and FCD			
		V_C (m/min)	fz (mm/tooth)	Max. Condition Depth (mm)	Max. Condition Width (mm)	V_C (m/min)	fz (mm/tooth)	Max. Condition Depth (mm)	Max. Condition Width (mm)
Shouldering	MHD 32-S32-4RSA	100	0.1	40	1/2 of Cutting Dia.	120	0.15	45	1/2 of Cutting Dia.
	40-S32-5RSA	100	0.1	45	1/2 of Cutting Dia.				
	40-S42-5RSA								
	50-S42-6RSA								
Grooving	MHD 32-S32-4RSA	80	0.1	1/2 of Cutting Dia.		100	0.15	1/2 of Cutting Dia.	
	40-S32-5RSA								
	40-S42-5RSA								
	50-S42-6RSA								
Slant Shouldering	MHD 32-S32-4RSA	80	0.1	40	1/2 of Cutting Dia.	80	0.1	45	1/2 of Cutting Dia.
	40-S32-5RSA	80	0.1	45	1/2 of Cutting Dia.				
	40-S42-5RSA								
	50-S42-6RSA								
Slant Grooving	MHD 32-S32-4RSA	80	0.1	1/2 of Cutting Dia.		80	0.1	1/2 of Cutting Dia.	
	40-S32-5RSA								
	40-S42-5RSA								
	50-S42-6RSA								

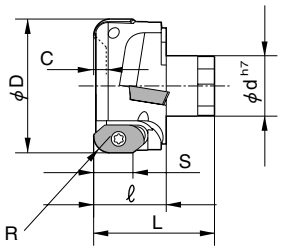
· MHD32-S32-4RSA is not suitable for grooving and slant grooving to general steel and alloy steel.

● : Std. Stock ○ : Check Availability

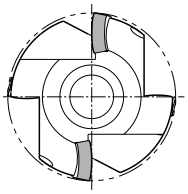
■ MHD-RF Radius Front Piece

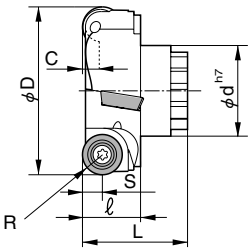
MHD32-RF





MHD40/50-RF



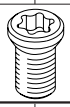
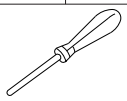
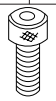


● Toolholder Dimension

Description	Stock	No. of Insert: Bottom Edge	No. of Insert: Middle Edge	No. of Edge Line	Dimension (mm): R	φD	φd	L	ℓ	C	S	Rake Angle (°): A.R.	R.R.: Bottom Edge	R.R.: Middle Edge	Applicable Insert ➡ P.429: Bottom Edge	Middle Edge
MHD 32-4RF	●	2	2	2	4	32	14.4	28.8	17.3	3	9.2	+9°	-5°	-7°	FPMT090340ER	NDKW090304ER NDKT0903○○(E/T)R-V NDKT090304ER-N1/N2
40-5RF	●	2	2	2	5	40	19	29.3	16.3	4	5		-3°	-3°	RPMT10T3M0	NDMM12T308ER-T/N2/N3
50-6RF	○	2	2	2	5	32	32	126	46	4	38.0		-5°	-7°	RPMT1204M0 RPMT1204M0-H	NDMM12T308ER-T/N2/N3

· When using "-T" insert, finished diameter will become smaller by approx. 0.2mm

● Spare Parts

Description		Spare Parts: Clamp Screw: For Bottom Insert	Clamp Screw: For Middle Insert	Wrench: For Bottom Insert	Wrench: For Middle Insert	Clamp Bolt: For 1 Front Piece	Clamp Bolt: For 2 Front Piece	Wrench	Anti-seize Compound
									
Separate type	**MHD 32-S32-4RSA**	SB-2560TR	SB-2560TR	DT-8	DT-8	-	HH8X50	LW-6	MP-1
	40-S32-5RSA **40-S42-5RSA**	SB-3080TR	SB-3080TR	DT-10	DT-10	-	HH8X55	LW-6	
	50-S42-6RSA	SB-4085TR	SB-3080TR	DT-15	DT-10	-	HH12X55	LW-10	
Base Unit	**MHD 32-S32-A**	SB-2560TR		DT-8		-	HH8X50	LW-6	MP-1
	40-S32-A **40-S42-A**	SB-3080TR		DT-10		-	HH8X65	LW-6	
	50-S42-A	SB-3080TR		DT-10		-	HH12X65	LW-10	
Front Piece	**MHD 32-F**	SB-2560TR		DT-8		-	-	-	-
	40-F **50-F**	SB-3080TR		DT-10					
Radius Front Piece	**MHD 32-4RF**	SB-2560TR	SB-2560TR	DT-8	DT-8	-	-	-	-
	40-5RF	SB-3080TR	SB-3080TR	DT-10	DT-10				
	50-6RF	SB-4085TR	SB-3080TR	DT-15	DT-10				
Integral type	**MHD 20-S20-4RC** **25S-S25-4RC**	SB-2560TR		DT-8		-	-	-	MP-1
	32-S32-5RC	SB-3080TR	SB-2560TR	DT-10	DT-8				
	40-S32-5RC	SB-3080TR	SB-3080TR	DT-10	DT-10				
	50-S42-6RC	SB-4085TR	SB-3080TR	DT-15	DT-10				

· In case of purchasing Front Piece only, Wrench (DT-8 or DT-10) is not attached to the product.
· In case of purchasing Base Unit and Front Pieces separately, Clamp Bolt and Wrench are not attached. Prepare them separately.
· Various Clamp Bolts for Front Piece attachment are ready. ➡ P.404
· Clamp Bolt for regular-type Front Piece (MHD···F) is attached to separate-type (MHD···SA/-SB) and Base Unit (MHD···A/-B)
· In case of replacing with Radius-type Front Piece (MHD···RF), different type of Clamp Bolt may be required. ➡ P.404

● : Std. Stock ○ : Check Availability

● Guide for Drilling

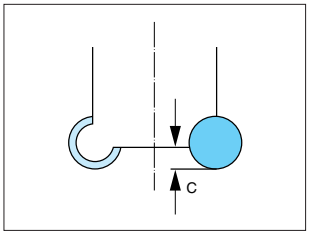
[Depth of Drilling]

- Radius Endmill : MRP-S

  See "Pd" value of the table in P.422. (Pd: Max. Plunge Depth)

- Radius Helical Endmill : MHD-RSA / MHD-RC

Insert	C-dimension (Distance from body bottom to insert end: mm)	Recommended D.O.C. at Drilling
FPMT090340ER	3mm	2mm
RPMT10T3M0	4mm	3mm
RPMT1204M0 RPMT1204M0-H	5mm	4mm
RPMT1606M0-H	7mm	6mm



· Set up the a*p* considering approx. 1mm clearance from C-dimension at Drilling.

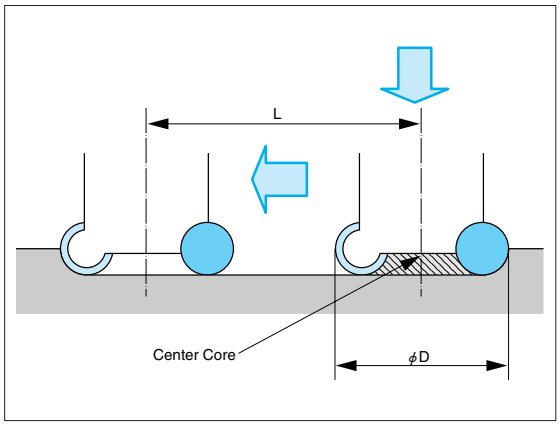
[Traversing after Drilling]

When traversing subsequent to drilling,

① Decrease the table feed down to the half of the normal traversing, until the center core part is completely milled off. (Because the internal cutting edge's radial rake angle is large to the negative direction)

② Min. transfer length "L" becomes as follows to make the work surface flat.

Insert	L (mm)
FPMT090340ER	ϕD-7
RDMT08T2M0-H	ϕD-7
RPMT10T3M0	ϕD-9
RPMT1204M0 RPMT1204M0-H	ϕD-11
RPMT1606M0-H	ϕD-15



● Guide for Ramping

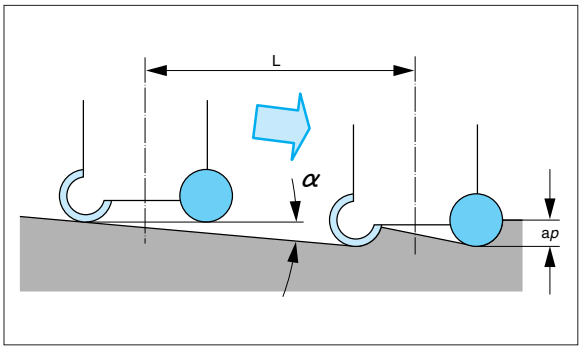
The transfer length "L" at the maximam slant angle α in the ramping operation depends on a*p*

Endmill	Angle α (°)	tan α
MHD32-S32-4RSA (MHD32-4R)	6°	0.105
40-S32-5RSA (MHD40-5R)	8°	0.141
40-S42-5RSA (MHD40-5R)	8°	0.141
50-S42-6RSA (MHD50-6R)	8°	0.141
MHD20-S20-4RC	17°	0.306
25S-S25-4RC	11°	0.194
32-S32-5RC	13°	0.231
40-S32-5RC	9°	0.158
50-S42-6RC	8°	0.141
MRP012-S16-08 (-160)	No Ramping Available	
016-S16-08 (-160)	4°	0.070
020-S20-08 (-180)	14°	0.249
025-S25-10-3T (-180)	14°	0.249
032-S32-10-4T (-200)	8°	0.141
032-S25-12 (-300)	15°	0.268
040-S32-12 (-300)	10°	0.176
040-S32-12-4T (-200)	9°	0.158
050-S42-12 (-300)	7°	0.123
040-S32-16 (-300)	20°	0.364
050-S42-16 (-300)	13°	0.231
063-S42-16 (-300)	8°	0.141
MRP012-W16-1T042-90 012-W16-1T042-130	No Ramping Available	
016-W16-2T042-90 016-W20-2T042-132 016-W25-2T042-183	11.5°	0.203
020-W20-2T042-92 020-W25-2T082-138 020-W25-2T082-183	14°	0.249
025-W32-3T082-142 025-W32-3T127-187	14°	0.249
032-W32-4T082-147 032-W32-4T127-187	9°	0.158
MRP025R-SC	14°	0.249
032R-SC	9°	0.158
040R-SC	9°	0.158

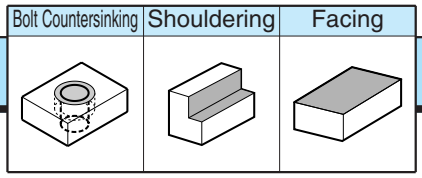
· Above is the value considering the clearance 1mm between the tool body and the work.

Formula of the Transfer Length "L" at Max. Slant Angle

$$L = \frac{ap}{\tan \alpha}$$



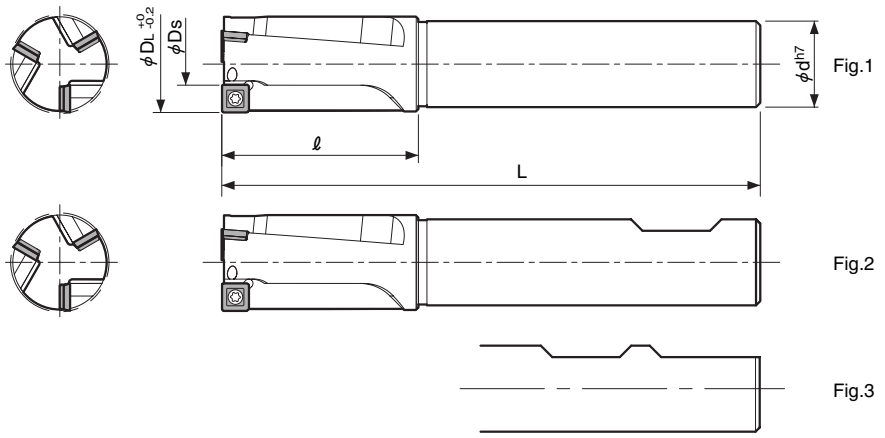
Bolt Countersink Endmill [SPMT Insert]



■ MEF


Standard (Straight)


Standard (Weldon)



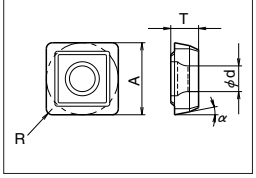
● Toolholder Dimension

Description		Stock	No. of Insert	Dimension (mm) φD	φDs	φd	L	ℓ	Rake Angle (°) A.R.	R.R.	Shape	Objective Bolt Size	Spare Parts: Clamp Screw	Spare Parts: Wrench	Applicable Insert
Standard (Straight)	MEF 14-S12	●	1	14	3.6	12	108	28	+5°	-13°	Fig.1	M8	SB-2260TR	DT-7	SPMT060204E-Z
	17-S16	●	2	17.5	6.5	16	115	35		-13°		M10			
	20-S16	●	3	20	8.3	16	120	40		-12°		M12			
	23-S20	●	3	23	11.6	20	126	46		-12°		M14			
	26-S25	●	3	26	9.8	25	132	52		-13°		M16	SB-3080TR	DT-10	SPMT090308E-Z
	29-S25	●	3	29	12.6	25	138	58		-13°		M18			
	32-S25	●	3	32	15.5	25	144	64		-13°		M20			
	35-S32	●	3	35	18.4	32	150	70		-13°		M22			
	39-S32	●	4	39	22.3	32	158	78		-13°		M24			
	43-S32	●	4	43	26.2	32	166	86		-12°		M27			
	48-S32	●	4	48	31.1	32	176	96		-12°		M30			
Standard (Weldon)	MEF 15-S12-80W	●	1	15	4.6	12	80	30	+5°	-13°	Fig.2	M8	SB-2260TR	DT-7	SPMT060204E-Z
	18-S16-90W	●	2	18	7.5	16	90	36	+5°	-13°		M10			
	20-S16-90W	●	3	20	8.3	16	90	40	+5°	-12°		M12			
	26-S25-120W	●	3	26	9.8	25	120	52	+5°	-13°	Fig.3	M16	SB-3080TR	DT-10	SPMT090308E-Z
	33-S25-140W	●	3	33	16.5	25	140	66	+5°	-13°		M20			
	40-S32-160W	●	4	40	23.3	32	160	80	+5°	-13°		M30			

· Before machining, the work must have the hole with diameter larger than φDs.

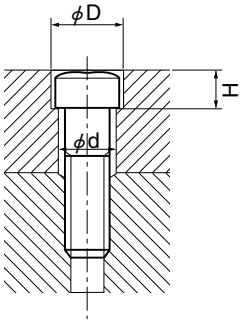
● Applicable Insert

SPMT...E-Z



Description		Dimension (mm) A	T	φd	W	R		Angle (°) α	Insert Grade: Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30
SPMT	060204E-Z	6.35	2.38	2.5	-	0.4		11°			●		○	●			●	
	090308E-Z	9.525	3.18	3.4	-	0.8					●		○	●			○	

◆ Bolt Hole Standard



Nominal Screw Size	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
φD (mm)	14	17.5	20	23	26	29	32	35	39	43	48
H (mm)	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
φd (mm)	9	11	14	16	18	20	22	24	26	30	33
Applicable Tool	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

● : Std. Stock ○ : Check Availability

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Grade (V_C: m/min)													
		Cermet		PVD Coated						Carbide		Diamond			
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304, etc)	0.05~0.1					★ 60~120	☆ 60~120								
Carbon Steel (SXXC)	0.1~0.15					☆ 60~130	★ 80~150								
Alloy Steel (SCM, etc.)	0.1~0.15					☆ 60~130	★ 80~150								
Metal Mold Steel (SKD/NAK, etc.)	0.05~0.1					☆ 70~120	★ 70~120								
Cast Iron (FC/FCD, etc.)	0.1~0.2			★ 80~150						☆ 80~120					
Non-ferrous Metal (Aluminum, etc.)	0.1~0.2									★ 100~300					

★: 1st Recommendation ☆: 2nd Recommendation

◆ Points at Bolt Countersink Milling

①Carbon Steel (S55C, etc)

Increase the feed rate to f=0.1~0.15mm/t to avoid the uncurled chip at low feed rate.
Chip control becomes good when setting the V_C 80m/min for MEF14 ~ MEF23, and 120m/min for MEF26 ~ MEF48.

Description	V_C (m/min)	fz (mm/tooth)
MEF14~MEF23	80	0.1~0.15
MEF26~MEF48	120	0.1~0.15

②Sticky Materials (SS400, etc.)

Step feed is recommended to cut chips short
Increase the feed rate to f=0.1~0.15mm/t to avoid the uncurled chip at low feed rate such as f=0.05mm/tooth.
However, use the machine cover to avoid the accident or injury by thick chips at higher feed rate.

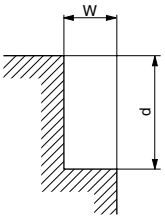
Description	V_C (m/min)	fz (mm/tooth)	Step Feed (mm)
MEF14~MEF48	80~150	0.1~0.15	0.5~1.5

③Stainless Steel (SUS304, etc.)

Set Cutting Speed lower. Higher Cutting Speed causes chattering.

◆ Cutting Performance at Shouldering

MEF Bolt Counter Sink Endmill is available for Shouldering, too.



V_C=80~120m/min
S55C
DRY
Overhang Length: Same as ℓ in the dimension table

· At shouldering, both side edge and bottom edge function.
Both edges wear at the same time depending on a*p*
and the insert becomes 2-corner use instead of 4-corner use
(See Fig. 1)

· MEF type's side edge is designed to have a slight clearance for the countersink milling.
Therefore, worked side wall is approx. 1° inclined against the vertical face.

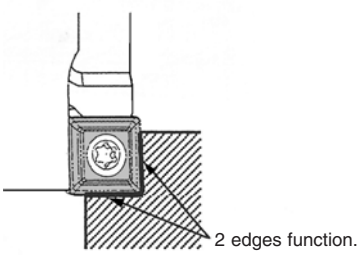


Fig.1

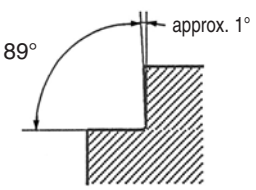
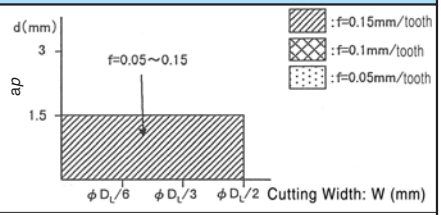
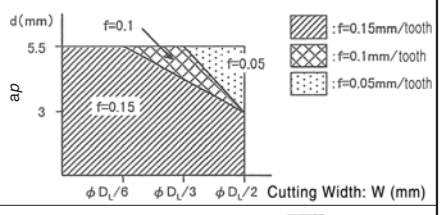
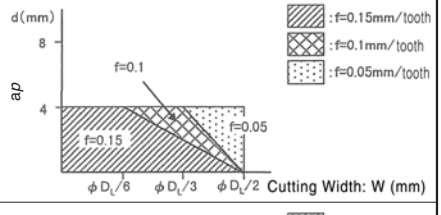
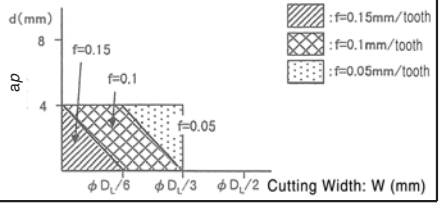


Fig.2

Description	Cutting Range
MEF14-S12 MEF17-S16	
MEF20-S16 MEF23-S20	
MEF26-S25 MEF29-S25 MEF32-S25 MEF35-S32	
MEF39-S32 MEF43-S32 MEF48-S32	

● : Std. Stock ○ : Check Availability

T-Slot Endmill [SDMT Insert]

■ METS

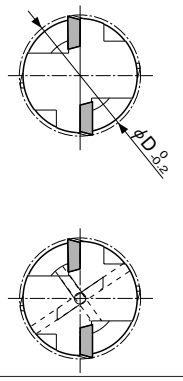


Fig.1

Fig.2

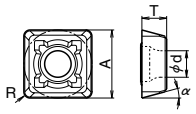
● Toolholder Dimension

Description	Stock	No. of Insert	No. of Edge Line	Dimension (mm) φD	φd	φd1	ℓ	L1	L2	L3	L4	L5	Rake Angle (°) A.R.	R.R.	Shape	Spare Parts Clamp Screw	Wrench	Applicable Insert
METS 21-S25	○	2	1	21	25	10.5	9	109	29	32	12	17						
25-S25	●	4	2	25	25	12.5	11	112	32	32	12	17		-10°				
32-S32	○	4	2	32	32	15.5	14	120	38	36	14	19	+9°		Fig.1	SB-2560TR	DT-8	SDMT060304E-K
40-S32	○	4	2	40	32	20.5	18	130	50	36	14	19		-12°		SB-3060TR	DT-10	SDMT080308E-K
50-S32	○	4	2	50	32	26.5	22	140	60	36	14	19				SB-4085TR	DT-15	SDMT120408E-K
METS 21-S25-H	●	2	1	21	25	10.5	9	109	29	32	12	17						
25-S25-H	●	4	2	25	25	12.5	11	112	32	32	12	17		-10°		SB-2560TR	DT-8	SDMT060304E-K
32-S32-H	●	4	2	32	32	15.5	14	120	38	36	14	19	+9°		Fig.2	SB-3060TR	DT-10	SDMT080308E-K
40-S32-H	●	4	2	40	32	20.5	18	130	50	36	14	19		-12°		SB-4085TR	DT-15	SDMT120408E-K
50-S32-H	●	4	2	50	32	26.5	22	140	60	36	14	19						

· METS····H type has Air Holes.

● Applicable Insert

SDMT...E-K

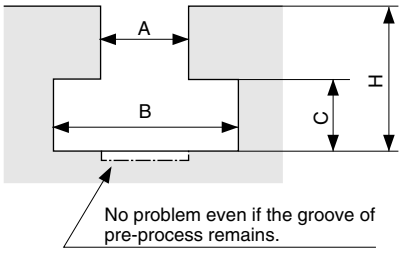


Description		Dimension (mm) A	T	φd	W	R		Angle (°) α	Insert Grade Cermet TN100M	TC60	PVD Coated PR510	PR630	PR660	PR730	PR830	PR930	Carbide KW10	PW30
SDMT	060304E-K	6.35	3.18	2.8	-	0.4					○		○	●			○	
	080308E-K	8.00	3.18	3.4	-	0.8		15°			○		○	●			○	
	120408E-K	12.70	4.76	3.4	-	0.8					●		●	●			○	

◆ JIS Standard of T-Slot (Extracted from B0952)

A (Nominal Size)	B	C	H Max.	H Min.
12	19 $^{+2}_{0}$	8 $^{+1}_{0}$	25	20
14	23 $^{+2}_{0}$	9 $^{+2}_{0}$	28	23
18	30 $^{+2}_{0}$	12 $^{+2}_{0}$	26	30
22	37 $^{+3}_{0}$	16 $^{+3}_{0}$	45	38
28	46 $^{+4}_{0}$	20 $^{+4}_{0}$	56	48

(Unit: mm)

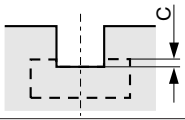
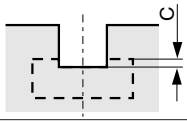
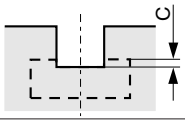
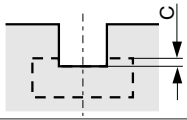
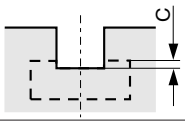
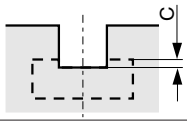
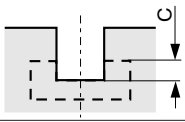
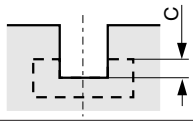
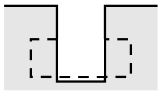


● : Std. Stock ○ : Check Availability

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C: m/min)													
		Cermet		PVD Coated						Carbide		Diamond			
		TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30	KPD025	KPD010	KPD002	KPD001
Stainless Steel (SUS304, etc)	-														
Carbon Steel (SXXC)	0.1～0.15					☆ 60～130	★ 80～150								
Alloy Steel (SCM, etc.)	0.08～0.12					☆ 60～130	★ 80～150								
Metal Mold Steel (SKD/NAK, etc.)	0.05～0.1					★ 60～100	☆ 60～100								
Cast Iron (FC/FCD, etc.)	0.1～0.15			★ 80～150						☆ 80～120					
Non-ferrous Metal (Aluminum, etc.)	0.1～0.15									★ 100～300					

★: 1st Recommendation ☆: 2nd Recommendation

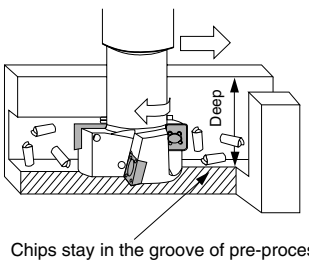
Description (T Slot Nominal Size)	Steel			Cast Iron		
	Recommended Groove Shape at Pre-process	Recommended T-Slotting Conditions	Recommended Conditions against Chattering	Recommended Groove Shape at Pre-process	Recommended T-Slotting Conditions	Recommended Conditions against Chattering
METS21-S25(-H) (Nominal Size12)	C=1～3mm 	V_C= 120 fz= 0.1 (n= 1820) (fv= 182)	V_C= 60 fz= 0.15 (n= 920) (fv= 137)	C=1mm over 	V_C= 120 fz= 0.12 (n= 1820) (fv= 218)	V_C= 80 fz= 0.15 (n= 1210) (fv= 182)
METS25-S25(-H) (Nominal Size14)	C=1～3mm 	V_C= 120 fz= 0.1 (n= 1530) (fv= 306)	V_C= 60 fz= 0.15 (n= 760) (fv= 228)	C=1mm over 	V_C= 120 fz= 0.12 (n= 1530) (fv= 367)	V_C= 80 fz= 0.15 (n= 1020) (fv= 306)
METS32-S32(-H) (Nominal Size18)	C=1～3mm 	V_C= 100 fz= 0.1 (n= 1000) (fv= 200)	V_C= 60 fz= 0.15 (n= 600) (fv= 180)	C=1mm over 	V_C= 120 fz= 0.12 (n= 1190) (fv= 286)	V_C= 80 fz= 0.15 (n= 800) (fv= 240)
METS40-S32(-H) (Nominal Size22)	C=9mm 	V_C= 80 fz= 0.15 Easy to Chatter when C is less than 9mm	V_C= 60 fz= 0.15 (n= 480) (fv= 144)	C=9mm over 	V_C= 120 fz= 0.15 (n= 960) (fv= 228)	V_C= 80 fz= 0.15 (n= 640) (fv= 192)
METS50-S32(-H) (Nominal Size28)	Not recommended to steel because of chattering				V_C= 120 fz= 0.15 (n= 760) (fv= 228)	V_C= 80 fz= 0.15 (n= 510) (fv= 153)

[Cutting Speed: V_C(m/min), Spindle Revolution: N(min^{-1}), Feed Rate: f (mm/tooth), Table Feed: F(mm/min)]

· Easy to chatter when f is less than 0.1mm/t. Keep feed rate between f=0.1-0.15.
At cast iron machining, the bigger the C-dimension becomes, the less chattering happens.

◆ How to Avoid Biting Chips at Steel machining

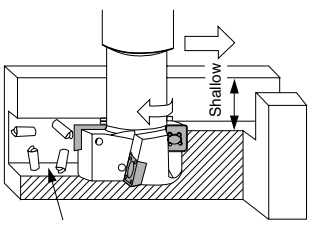
Before Improvement (Deep Groove at Pre-Process)



Chips stay in the groove of pre-process.

Improvement

After Improvement (Shallow Groove at Pre-Process)



Chips are evacuated backward and chances of biting chips are less.

Make pre-process grooving shallower to avoid the tool damage from biting chips.
Use compressed air for smooth in chip evacuation.

■ MCSE


Standard (Straight)


Standard (Weldon)

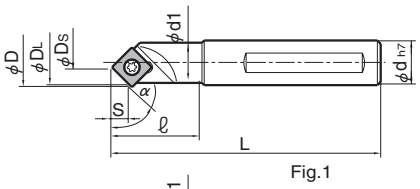


Fig.1

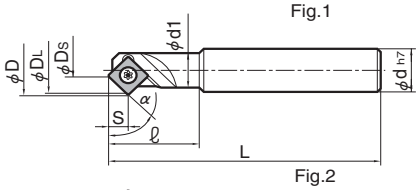


Fig.2

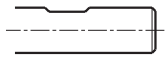


Fig.3

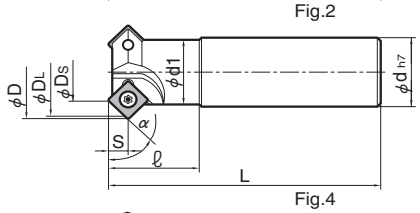


Fig.4

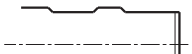


Fig.5

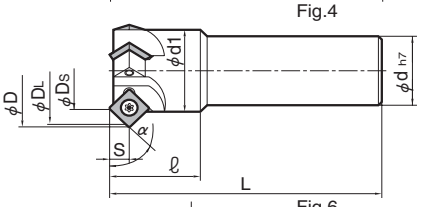


Fig.6


Fig.7

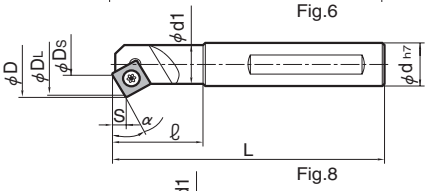


Fig.8

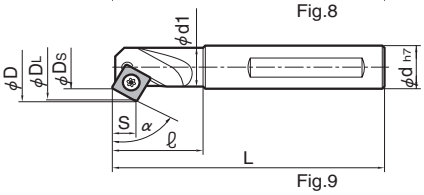
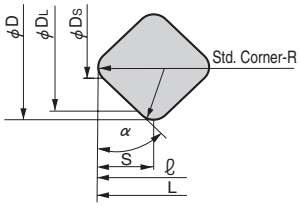


Fig.9



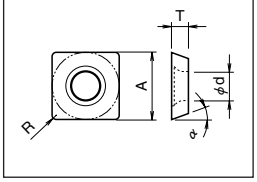
● Toolholder Dimension

Description			Stock	No. of Insert	Dimension (mm)							Std. Corner-R	Angle (°)	Rake Angle (°)		Shape	Spare Parts		Applicable Insert
					ϕD	ϕDL	ϕDs	ϕd	ϕd1	L	ℓ	S		α	A.R.	R.R.		Clamp Screw	Wrench	
Standard (Straight)	MCSE	104 NEW	●	1	16	15	4	16	15	85	30	6.5	0.4	45°	0°	-4.5°	Fig.1	SB-3060TR	DT-10	SDKW09 SDMT09
		106	●	1	22	21	6	20	16	120	40	8.6	0.8			-1°	Fig.2	SB-5090TR	LTW-20	SEKW12 SEMT12
		115	●	1	31	30	15	20	18	120	40	8.6				+5°				
		227	○	2	43	42	27	32	30	120	40	8.6				+8°	Fig.4			
		336	○	3	52	51	36	32	38	120	40	8.6				+10°	Fig.6			
Standard (Weldon)	MCSE	106-W	●	1	22	21	6	20	16	92	40	8.6	0.8	45°	0°	-1°	Fig.3	SB-5090TR	LTW-20	SEKW12 SEMT12
		115-W	●	1	31	30	15	20	18	92	40	8.6				+5°				
		227-W	●	2	43	42	27	32	30	120	40	8.6				+8°	Fig.5			
		336-W	●	3	52	51	36	32	38	105	45	8.6				+10°	Fig.7			
Standard (Straight)	MCSE	104-30D NEW	●	1	19	18	4	16	15	85	30	4.7	0.4	30°	0°	-4°	Fig.8	SB-3060TR	DT-10	SDKW09 SDMT09
		108-30D NEW	●	1	28	27	8	20	19	110	40	6.3	0.8			-2.5°		SB-5090TR	LTW-20	SEKW12 SEMT12
		110-30D	●	1	30	28	10	20	18	120	40	6.3				0°				
	MCSE	108-60D NEW	●	1	19.5	19	8	20	19	110	40	10	0.8	60°	0°	-3.5°	Fig.9	SB-5070TR	LTW-20	SEKW12
		120-60D	●	1	31	30	20	20	18	120	40	10				0°		SB-5090TR		SEMT12

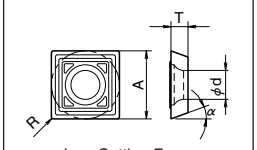
● : Std. Stock ○ : Check Availability

● Applicable Insert

S(D/E)KW...(T/F)N



S(D/E)MT...C



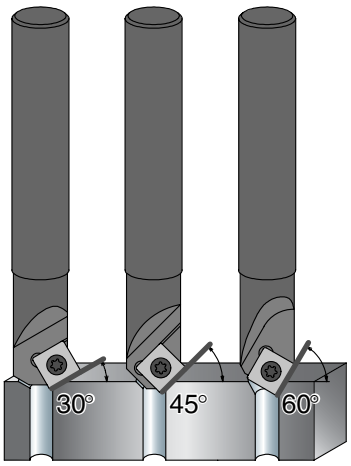
Low Cutting Force

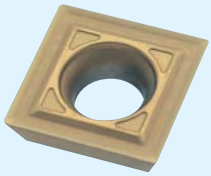
Description	Dimension (mm)						Angle (°)	Insert Grade									
								Cermet		PVD Coated						Carbide	
	A	T	φd	W	R		α	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
SDKW 09T204TN NEW	9.525	2.78	3.4	-	0.4		15°	●					●				
09T204FN NEW	9.525	2.78	3.4	-	0.4		15°									●	
SDMT 09T204C NEW	9.525	2.78	3.4	-	0.4		15°	●					●			●	
SEKW 120304TN	12.70	3.18	5.5	-	0.4		20°	●	○		○		●				
120308TN	12.70	3.18	5.5	-	0.8		20°	●	○		○		●				
SEKW 120304FN	12.70	3.18	5.5	-	0.4		20°									●	
120308FN	12.70	3.18	5.5	-	0.8		20°									●	
SEMT 120304C NEW	12.70	3.18	5.5	-	0.4		20°									●	

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)		Recommended Grade (V_C: m/min)									
			Cermet			PVD Coated					Carbide	
	φDs (φ4~φ20)	φDs (φ27~φ36)	TN100M	TC60	PR510	PR630	PR660	PR730	PR830	PR930	KW10	PW30
Stainless Steel (SUS304, etc)	0.05~0.2	0.1~0.3	☆ 100~180	☆ 80~160		☆ 100~180		★ 100~180				
Carbon Steel (SXXC)	0.05~0.25	0.2~0.4	★ 100~180	☆ 80~160		☆ 100~180		★ 100~180				
Alloy Steel (SCM, etc.)	0.05~0.25	0.2~0.4	★ 100~180	☆ 80~160		☆ 80~150		★ 80~150				
Metal Mold Steel (SKD/NAK, etc.)	0.05~0.25	0.2~0.4	★ 100~150	☆ 80~130		☆ 60~130		★ 60~130				
Cast Iron (FC/FCD, etc.)	0.1~0.3	0.3~0.5									★ 80~150	
Non-ferrous Metal (Aluminum, etc.)	0.1~0.3	0.3~0.5									★ 100~300	

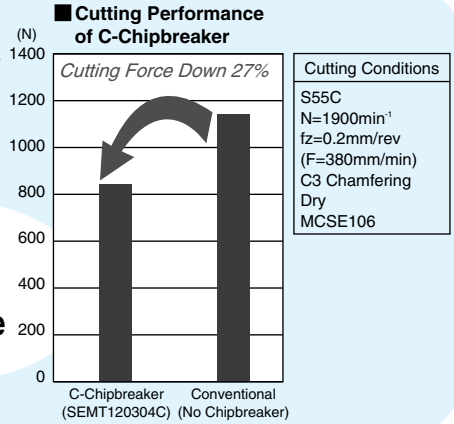
★: 1st Recommendation ☆: 2nd Recommendation





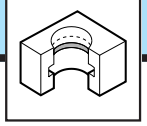
C-Chipbreaker reduces the cutting force by Max. 27%

■ Cutting Performance of C-Chipbreaker

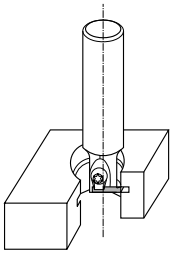


Cutting Conditions
S55C
N=1900min^{-1}
fz=0.2mm/rev
(F=380mm/min)
C3 Chamfering
Dry
MCSE106

Grooving Endmill for M/C [GVR Insert]



■ MGI



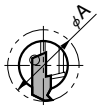


Fig.1

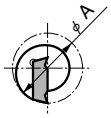


Fig.2

● Toolholder Dimension

Description	Stock	Min. Bore Dia. φA	Dimension (mm) φd	L1	L2	F	T	Width (mm) W	Shape	Spare Parts: Clamp Set 5F	Clamp Set 6F	Clamp Screw	Wrench	Applicable Insert
MGI 1420-1SS	●	14	20	100	20	6.8	2.2	1.0~3.0	Fig.1	-		**SB-4065TR**	**FT-15**	GVR100SS~GVR300SS
1620-1S	●	16	20	110	25	7.8	2.2	1.0~3.4	Fig.1	-		**SB-4085TR**	**FT-15**	GVR100S~GVR340S
2020-1A	●	20	20	110	30	9.8	2.2	1.0~3.4	Fig.2	**CPS-5F**		-	**FT-15**	GVR100A~GVR340A GVR100AR~150AR
2220-1B	●	22	20	110	30	11	2.8	1.45~4.0	Fig.2	**CPS-5F**		-	**FT-15**	GVR145B~GVR400B GVR100BR~150BR
3225-1C	●	32	25	120	35	16	5.5 (4.5)	2.8~4.0	Fig.2	**CPS-6F**		-	**LW-3**	GVR280C~GVR400C
4025-1C	●	40	25	120	40	20	5.5 (4.5)	2.8~4.0	Fig.2	**CPS-6F**		-	**LW-3**	GVR280C~GVR400C

- T Dimension shows the available grooving depth.
- GVR280C, GVR300C is available to the groove depth up to 4.5mm
- GVR430C-500C can be installed to MGI3225-1C and 4025-1C, but not recommended to steel machining because of toolholder's rigidity

◆ Recommended Cutting Conditions

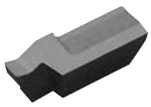
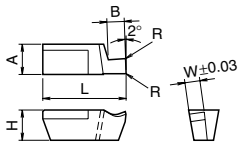
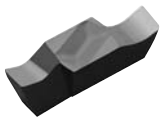
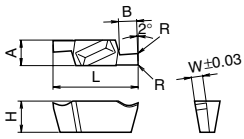
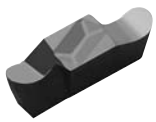
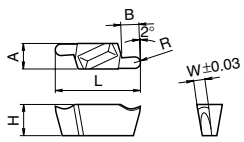
Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C: m/min) Cermet TN60	Cermet TN90	Cermet TC40	Cermet TC60	CVD Coated CR9025	PVD Coated PR630	PVD Coated PR930	Carbide KW10
Stainless Steel (SUS304, etc)	0.03~0.12		☆ 100~180	☆ 100~180	★ 80~150		☆ 60~130	★ 60~130	
Carbon Steel (SXXC)	0.05~0.15		★ 120~200	☆ 120~200	☆ 100~180		☆ 80~150	☆ 80~150	
Alloy Steel (SCM, etc.)	0.05~0.15		★ 120~200	☆ 120~200	☆ 100~180		☆ 80~150	☆ 80~150	
Metal Mold Steel (SKD/NAK, etc.)	0.03~0.12		★ 100~180	☆ 100~180	☆ 80~150		☆ 60~130	☆ 60~130	
Cast Iron (FC/FCD, etc.)	0.05~0.2		★ 100~150	☆ 100~150					★ 80~150
Non-ferrous Metal (Aluminum, etc.)	0.05~0.2								★ 100~300

· Use down-cut machining.

★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

● Applicable Insert

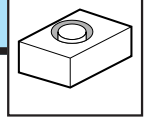
Shape (Right-hand Shown)	Description		Dimension (mm)						Insert Grade							
									Cermet				CVD Coated	PVD Coated		Carbide
			W	B	R	A	L	H	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10
  1-Corner Use	GVR	100SS	1.00	2.3	0.2	3.6	9	3.0		○		●		○	●	○
		125SS	1.25							○		●		○	●	○
		145SS	1.45							○		○		○	●	○
		200SS	2.00							○		○		○	●	○
		250SS	2.50							○		○		○	●	○
		300SS	3.00							○		○		○	●	○
	GVR	100S	1.00	2.3	0.2	4.0	11	4.0		○	○	○		○	●	○
		125S	1.25							○	○	○		○	●	○
		145S	1.45							○	○	○		○	●	○
		185S	1.85							○	○	○		○	●	○
		200S	2.00							○	○	○		○	●	○
		250S	2.50							○	○	○		○	●	○
		340S	3.40								○	○		○	●	○
  2-Corner Use	GVR	100A	1.00	2.3	0.2	4.0	12	5.0		○	○	●		○	○	○
		120A	1.20									●				
		125A	1.25							○	○	●		○	○	○
		140A	1.40									●				
		145A	1.45							○	○	●		○	○	○
		170A	1.70									●				
		185A	1.85							○	○	●		○	○	○
		195A	1.95									●				
		200A	2.00							○	○	●		○	●	○
		225A	2.25									●				
		250A	2.50							○	○	●		○	●	○
		275A	2.75									●				
		300A	3.00							○	○	●		○	●	○
		340A	3.40							○	○	●		○	●	○
	GVR	145B	1.45	2.8	0.2	4.5	15	5.5		○	○	○		○	○	○
		185B	1.85							○	○	○		○	○	○
		200B	2.00	3.2						○	○	●		○	●	○
		225B	2.25									●				
		230B	2.30							○	○	○		○	○	●
		250B	2.50							○	○	●		○	○	○
		275B	2.75									●				
		280B	2.80							○	○	○		○	○	○
		300B	3.00	4.2						○	○	●		○	○	○
		325B	3.25									●				
		340B	3.40							○	○	○		○	○	○
		400B	4.00							○	○	●		○	○	○
	GVR	280C	2.80	4.5	0.2	5.8	21	6.5		○	○	○		○	○	○
		300C	3.00							○	○	○		○	○	○
		325C	3.25	5.5								●				
		340C	3.40							○	○	○		○	○	○
		400C	4.00							○	○	●		○	○	○
		425C	4.25	6.3								●				
		(430C)	4.30							○	○	○		○	○	○
		(460C)	4.60								○	○		○	○	○
		(500C)	5.00							○	○	○		○	●	○
  2-Corner Use Full-R	GVR	100AR	2.00	2.3	1.00	4.0	12	5.0				●		○	○	○
		125AR	2.50		1.25							○		○	○	○
		150AR	3.00		1.50							○		○	○	○
	GVR	100BR	2.00	3.2	1.00	4.5	15	5.5		○		●		○	○	○
		150BR	3.00	4.2	1.50					○		○		○	○	○

● Use down-cut machining.

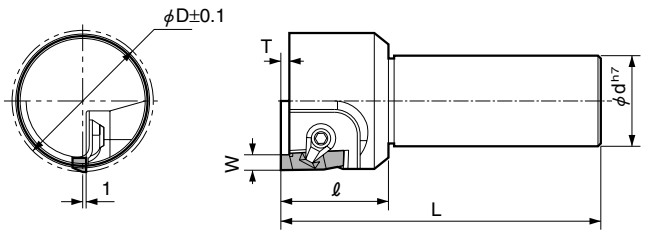
● : Std. Stock ○ : Check Availability

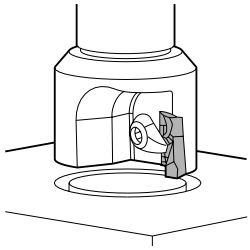
Ring Grooving Endmill [GVFR Insert]

Ring Grooving

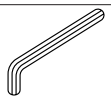


■ MVG



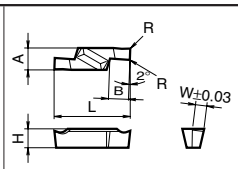


● Toolholder Dimension

Description	Stock	Dimension (mm)					Width (mm)	Spare Parts	
								Clamp Set	Wrench
		ϕD	ϕd	L	ℓ	T	W		
MVG 3032	○	30	32	120	40	5.2	4.00 ~ 4.90	**CPS-6V**	**LW-3**
3532	○	35	32	120	40	5.2			
4032	○	40	32	120	40	5.2			
4532	○	45	32	120	40	5.2			
5032	○	50	32	120	40	5.2			
5532	○	55	32	120	40	5.2			
6032	○	60	32	120	40	5.2			
6532	○	65	32	120	40	5.2			
7032	○	70	32	120	40	5.2			
7532	○	75	32	120	40	5.2			

· T Dimension shows the available grooving depth.

● Applicable Insert

Shape (Right-hand Shown)		Description		Dimension (mm)						Insert Grade							
										Cermet				CVD Coated	PVD Coated		Carbide
				W	B	R	A	L	H	TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10
		**GVFR**	**400B**	4.00	5.3	0.2	5.8	20	5.0		○	○	●		○	○	○
			430B	4.30								○	○		○	○	○
			460B	4.60								○	●		○	○	○
			490B	4.90								○	○		○	○	○

- GVFR430B is applicable for O-Ring grooving of G-series
  For other ring grooving, GVFR400B-490B are applicable.
- Only right-hand insert is applicable

◆ Recommended Cutting Conditions

Work Material	fz (mm/tooth)	Recommended Insert Grade (V_C: m/min)							
		Cermet				CVD Coated	PVD Coated		Carbide
		TN60	TN90	TC40	TC60	CR9025	PR630	PR930	KW10
Stainless Steel (SUS304, etc)	0.03~0.12			☆ 100~180	★ 80~150		☆ 60~130	★ 60~130	
Carbon Steel (SXXC)	0.05~0.15			★ 120~200	☆ 100~180		☆ 80~150	☆ 80~150	
Alloy Steel (SCM, etc.)	0.05~0.15			★ 120~200	☆ 100~180		☆ 80~150	☆ 80~150	
Metal Mold Steel (SKD/NAK, etc.)	0.03~0.12			★ 100~180	☆ 80~150		☆ 60~130	☆ 60~130	
Cast Iron (FC/FCD, etc.)	0.05~0.2								★ 80~150
Non-ferrous Metal (Aluminum, etc.)	0.05~0.2								★ 100~300

★: 1st Recommendation ☆: 2nd Recommendation

● : Std. Stock ○ : Check Availability

CBN & Diamond Tools

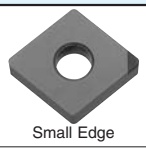
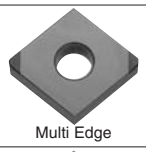
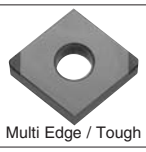
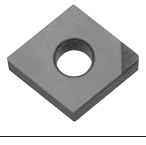
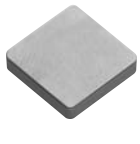
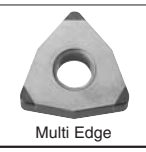
441～466

Turning Indexable Inserts

Negative

Edge Preparation			
KBN10B / KBN25B : Without Indication, SE, S2E, S3E	0.12mm×25°+honing	KBN25B : SE-T, ME-T	0.17mm×30°+honing
		KBN65B	0.12mm×15°
KBN10B / KBN25B : -T00315	0.03mm×15°	KBN900 : Without Indication	0.20mm×20°+honing
KBN10B / KBN25B : -T00520	0.05mm×20°	KBN900 : -S	0.20mm×20°+honing
KBN10B / KBN25B : -T01520	0.15mm×20°	KBN900 : -S0415	0.40mm×15°+honing
KBN10B / KBN25B : -T02025	0.20mm×25°	KBN900 : -S20015	2.00mm×15°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

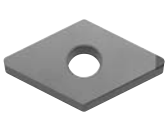
Shape	Description	Dimension (mm) A	T	ϕd	R	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Small Edge	CNGA 120402SE	12.70	4.76	5.16	0.2	2.6	1	●	○			95 189
	CNGA 120404SE				0.4	2.5		●	○	●		
	CNGA 120408SE				0.8	2.6		◎	◎	●		
	CNGA 120412SE				1.2	2.5		●	○	●		
 Small Edge / Tough	CNGA 120404SE-T	12.70	4.76	5.16	0.4	2.5	1		○			
	CNGA 120408SE-T				0.8	2.6			○			
	CNGA 120412SE-T				1.2	2.5			○			
	CNGA 120408SE-T00520	12.70	4.76	5.16	0.8	1.8		●				
	CNGA 120408SE-T02025				0.8	2.6		●				
 Multi Edge	CNGA 120402S2E	12.70	4.76	5.16	0.2	2.0	2	●				
	CNGA 120404S2E				0.4	2.5		●	●			
	CNGA 120408S2E				0.8	2.6		●	●	●		
	CNGA 120412S2E				1.2	2.5			●	●		
 Multi Edge / Tough	CNGA 120404ME-T	12.70	4.76	5.16	0.4	2.5	2		●			
	CNGA 120408ME-T				0.8	2.6			●			
	CNGA 120412ME-T				1.2	2.5			●			
	CNGA 120404	12.70	4.76	5.16	0.4	3.7	1	○	○	●		
	CNGA 120408				0.8	3.6		○	○	●		
	CNGA 120412				1.2	3.6		●	○	●		
 Solid	CNMN 090308	9.525	3.18	-	0.8	-	4				○	451 456
	CNMN 090312				1.2						○	
	CNMN 090308S	9.525	3.18	-	0.8	-					●	
	CNMN 090312S				1.2						●	
	CNMN 120408	12.70	4.76	-	0.8	-					○	108
	CNMN 120412				1.2						○	
	CNMN 120416 NEW				1.6						○	
	CNMN 120412S	12.70	4.76	-	1.2	-					●	
	CNMN 120416S				1.6						●	
	CNMN 120412S04015	12.70	4.76	-	1.2	-					●	
	CNMN 120416S04015				1.6						●	
 Small Edge	WNGA 080404SE	12.70	4.76	5.16	0.4	2.0	1	●	○			96 191,192
	WNGA 080408SE				0.8	1.9		●	●			
 Small Edge / Tough	WNGA 080404SE-T	12.70	4.76	5.16	0.4	2.0	1		○			
	WNGA 080408SE-T				0.8	1.9			○			
 Multi Edge	WNGA 080408S3E	12.70	4.76	5.16	0.8	2.6	3		●			

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

Negative

Edge Preparation			
KBN10B / KBN25B : Without Indication, SE, S2E, S3E	0.12mm×25°+honing	KBN25B : SE-T, ME-T	0.17mm×30°+honing
		KBN65B	0.12mm×15°
KBN10B / KBN25B : -T00315	0.03mm×15°	KBN900 : Without Indication	0.20mm×20°+honing
KBN10B / KBN25B : -T00520	0.05mm×20°	KBN900 : -S	0.20mm×20°+honing
KBN10B / KBN25B : -T01520	0.15mm×20°	KBN900 : -S0415	0.40mm×15°+honing
KBN10B / KBN25B : -T02025	0.20mm×25°	KBN900 : -S20015	2.00mm×15°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

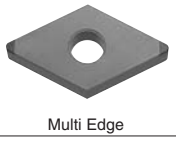
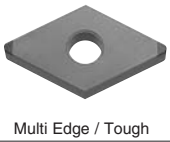
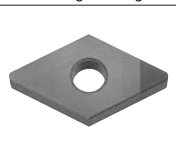
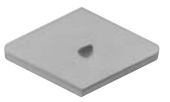
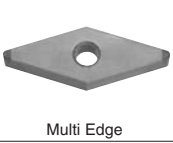
Shape	Description	Dimension (mm) A	T	φd	R	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Multi Edge / Tough	**WNGA 080408ME-T**	12.70	4.76	5.16	0.8	2.6	3		●			96
	080412ME-T				1.2	2.5			●			191,192
 Small Edge	**TNGA 160401SE** NEW	9.525	4.76	3.81	0.1	2.6	1		○			97,98 194
	160402SE				0.2	2.6		○	○			
	160404SE				0.4	2.4		●	○	●		
	160408SE				0.8	2.5		●	○	●		
	160412SE				1.2	2.2			○	●		
 Small Edge / Tough	**TNGA 160404SE-T**	9.525	4.76	3.81	0.4	2.4	1		○			
	160408SE-T				0.8	2.5			○			
	160412SE-T				1.2	2.2			○			
 Multi Edge	**TNGA 160404S3E**	9.525	4.76	3.81	0.4	2.4	3	●	●			
	160408S3E				0.8	2.5		●	●			
	160412S3E				1.2	2.2			●			
 Multi Edge / Tough	**TNGA 160402ME-T**	9.525	4.76	3.81	0.2	2.5	3		●			
	160404ME-T				0.4	2.4			●			
	160408ME-T				0.8	2.5			●			
	160412ME-T				1.2	2.2			●			
	160416ME-T				1.6	1.9			●			
	**TNGA 160404**	9.525	4.76	3.81	0.4	3.8	1	○	○	●		
	160408				0.8	3.5		○	○	●		
 Solid	**TNMN 110308**	6.35	3.18	-	0.8	-	6				○	452
	110312				1.2						●	457
	TNMN 110308S	6.35	3.18	-	0.8	-					●	
	110312S				1.2						●	
	TNMN 160408	9.525	4.76	-	0.8	-					○	109
	160412				1.2						○	
	160416 NEW				1.6						○	
	160420 NEW				2.0						○	
	TNMN 160408S	9.525	4.76	-	0.8	-					●	
 Small Edge	**DNGA 150401SE** NEW	12.70	4.76	5.16	0.1	2.2	1		○			99
	150402SE				0.2	2.5		○	○			
	150404SE				0.4	2.3		○	●	●		
	150408SE				0.8	1.9		○	●	●		
	150412SE				1.2	1.9			○			
	DNGA 150604SE	12.70	6.35	5.16	0.4	1.7		●				
	150608SE				0.8	1.4		●				
 Small Edge / Tough	**DNGA 150404SE-T**	12.70	4.76	5.16	0.4	2.3	1		○			
	150408SE-T				0.8	1.9			○			
	150412SE-T				1.2	1.9			○			

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

Negative

Edge Preparation			
KBN10B / KBN25B : Without Indication, SE, S2E, S3E	0.12mm×25°+honing	KBN25B : SE-T, ME-T	0.17mm×30°+honing
		KBN65B	0.12mm×15°
KBN10B / KBN25B : -T00315	0.03mm×15°	KBN900 : Without Indication	0.20mm×20°+honing
KBN10B / KBN25B : -T00520	0.05mm×20°	KBN900 : -S	0.20mm×20°+honing
KBN10B / KBN25B : -T01520	0.15mm×20°	KBN900 : -S0415	0.40mm×15°+honing
KBN10B / KBN25B : -T02025	0.20mm×25°	KBN900 : -S20015	2.00mm×15°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

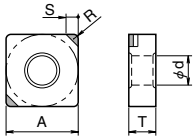
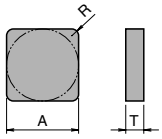
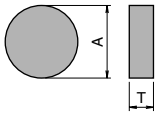
Shape	Description	Dimension (mm) A	T	φd	R	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Multi Edge	**DNGA 150404S2E**	12.70	4.76	5.16	0.4	2.3	2	●	●			99
	DNGA 150408S2E				0.8	1.9		●				
	DNGA 150412S2E				1.2	1.9						
	DNGA 150604S2E	12.70	6.35	5.16	0.2	2.3			●			
	DNGA 150608S2E				0.4	1.9			●	●		
	DNGA 150612S2E				0.8	1.9			●			
 Multi Edge / Tough	**DNGA 150404ME-T**	12.70	4.76	5.16	0.4	2.3	2		○			
	DNGA 150408ME-T				0.8	1.9			○			
	DNGA 150412ME-T				1.2	1.9			○			
	DNGA 150608ME-T	12.70	6.35	5.16	0.8	1.9			●			
	DNGA 150612ME-T				1.2	1.9			●			
	**DNGA 150404**	12.70	4.76	5.16	0.4	5.8	1	●	○	●		
	DNGA 150408				0.8	5.5		●	●	●		
	DNGA 150616	12.70	6.35	5.16	1.6	4.7			●			
 Solid	**DNMN 110308S**	9.525	3.18	–	0.8	–	4				●	–
	DNMN 110312S				1.2						●	
 Small Edge	**VNGA 160401SE** NEW	9.525	4.76	3.81	0.1	2.6	1	○	○			100,101
	VNGA 160402SE				0.2	2.2		○	○			
	VNGA 160404SE				0.4	1.9		●	◎	●		
	VNGA 160408SE				0.8	1.6		◎	●	●		
 Small Edge / Tough	**VNGA 160404SE-T**	9.525	4.76	3.81	0.4	1.9	1		●			
	VNGA 160408SE-T				0.8	1.6			○			
 Multi Edge	**VNGA 160402S2E**	9.525	4.76	3.81	0.2	2.3	2	●				
	VNGA 160404S2E				0.4	2.0		●	●			
	VNGA 160408S2E				0.8	1.7		●	●			
 Multi Edge / Tough	**VNGA 160404ME-T**	9.525	4.76	3.81	0.4	1.9	2		●			
	VNGA 160408ME-T				0.8	1.6			●			
	**VNGA 160404**	9.525	4.76	3.81	0.4	4.9	1	●	●	●		
	VNGA 160408				0.8	4.0		○	○	●		
 Multi Edge	**SNGA 120404S2E**	12.70	4.76	5.16	0.4	1.8	2	●	●			102,103
	SNGA 120408S2E				0.8	2.0			●			

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

Negative

Edge Preparation			
KBN10B / KBN25B : Without Indication, SE, S2E, S3E	0.12mm×25°+honing	KBN25B : SE-T, ME-T	0.17mm×30°+honing
		KBN65B	0.12mm×15°
KBN10B / KBN25B : -T00315	0.03mm×15°	KBN900 : Without Indication	0.20mm×20°+honing
KBN10B / KBN25B : -T00520	0.05mm×20°	KBN900 : -S	0.20mm×20°+honing
KBN10B / KBN25B : -T01520	0.15mm×20°	KBN900 : -S0415	0.40mm×15°+honing
KBN10B / KBN25B : -T02025	0.20mm×25°	KBN900 : -S20015	2.00mm×15°+honing

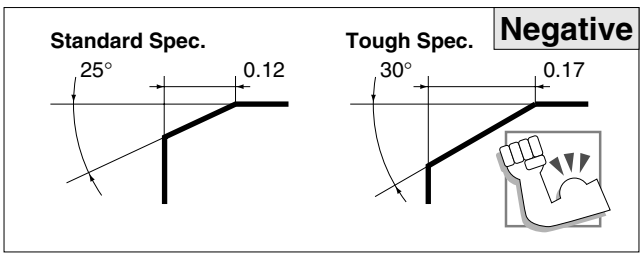
"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

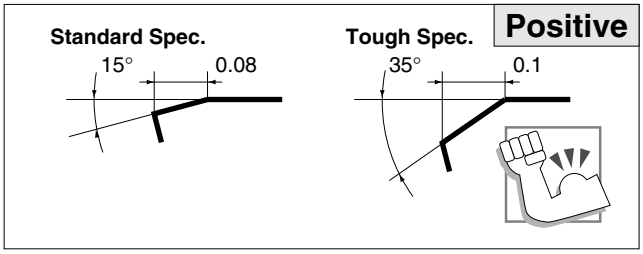
Shape		Description	Dimension (mm) A	T	φd	R	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Multi Edge / Tough		**SNGA 120408ME-T**	12.70	4.76	5.16	0.8	1.8	2		○			102,103
		120412ME-T				1.2	1.8			●			
 Solid		**SNMN 090308**	9.525	3.18	-	0.8	-	8				○	453,454
		090312				1.2						●	457
		SNMN 120308	12.70	3.18	-	0.8	-					○	
		120312				1.2						●	
		SNMN 120408	12.70	4.76	-	0.8	-					○	112,113
		120412				1.2						○	
		120416 NEW				1.6						○	
		120420 NEW				2.0						○	
		SNMN 120408S	12.70	4.76	-	0.8	-					●	198
		120412S				1.2						●	453,454
		SNMN 120412S04015	12.70	4.76	-	1.2	-					●	
		120416S04015				1.6						●	
		120432S04015				3.2						●	
 Solid		**RNMN 060300S**	6.0	3.18	-	-	-	Depends on D.O.C.				●	–
		RNMN 090300	9.525	3.18	-	-	-					●	455
		RNMN 090300S										●	
		RNMN 120300	12.70	3.18	-	-	-					○	
		RNMN 120300S										●	
		RNMN 120400	12.70	4.76	-	-	-					○	114
		RNMN 120400S										●	455
		RNMN 120400S04015										●	
		RNMN 250400S20015	25.40	4.76	-	-	-					●	–

High Stability Tough Spec.(KBN25B)

Tough Spec. (tough edge) is stable at the interrupted machining.

● "**-T**" is indicated at the tail end of thedescription.

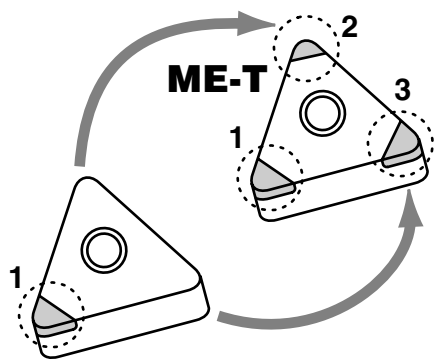




High Economy Multi Edge

Multi Edge is multiple corners use insert and economical.

● "**S2E**", "**S3E**" or "**ME**-T" is indicated at the tail end of the description.



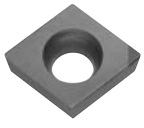
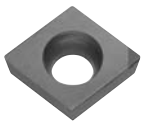
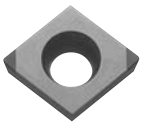
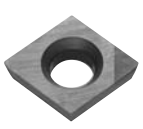
●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

Turning Indexable Inserts

■ Positive

Edge Preparation			
KBN10B / KBN25B / KBN65B : Without Indication, SE, S2E, S3E	0.08mm×15°+honing	KBN25B : SE-T, ME-T	0.10mm×35°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

Shape	Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Small Edge	CCMW 030102SE	3.5	1.4	1.9	0.2	1.4	7°	1	○	○			160,161
	CCMW 030104SE				0.4	1.4			○	○			
	CCMW 040102SE	4.3	1.8	2.3	0.2	1.4	7°		○	○			
	CCMW 040104SE				0.4	1.4			○	●			
	CCMW 060202SE	6.35	2.38	2.8	0.2	2.0	7°		●	○			130,131 162,164
	CCMW 060204SE				0.4	1.9			●	○			
	CCMW 09T302SE	9.525	3.97	4.4	0.2	2.0	7°		○	○			130,131 164
	CCMW 09T304SE				0.4	1.9			●	○			
	CCMW 09T308SE				0.8	1.9			●				
 Small Edge / Tough	CCMW 030104SE-T	3.5	1.4	1.9	0.4	1.4	7°	1		○			160,161
	CCMW 040104SE-T	4.3	1.8	2.3	0.4	1.4	7°			●			
	CCMW 060204SE-T	6.35	2.38	2.8	0.4	1.9	7°			○			130,131 162,164
	CCMW 09T304SE-T	9.525	3.97	4.4	0.4	1.9	7°			○			130,131 164
	CCMW 09T308SE-T01520	9.525	3.97	4.4	0.8	1.9	7°		●				
 Multi Edge	CCMW 030102S2E	3.5	1.4	1.9	0.2	1.4	7°	2	●	●			160,161
	CCMW 030104S2E				0.4	1.4			●				
	CCMW 060202S2E	6.35	2.38	2.8	0.2	2.0	7°		●	●			130,131 162,164
	CCMW 060204S2E				0.4	1.9			●	●			
	CCMW 060208S2E				0.8	1.8				●			
	CCMW 09T302S2E	9.525	3.97	4.4	0.2	1.9	7°		●				130,131 164
	CCMW 09T304S2E				0.4	1.9			●	●			
	CCMW 09T308S2E				0.8	1.9			●	●	●		
	CCMW 09T312S2E				1.2	2.3					●		
	CCMW 120412S2E	12.70	4.76	5.5	1.2	1.9	7°		●				131
 Multi Edge / Tough	CCMW 060208ME-T	6.35	2.38	2.8	0.8	1.8	7°	2		●			130,131 162,164
	CCMW 09T304ME-T	9.525	3.97	4.4	0.4	1.9	7°			●			130,131 164
	CCMW 09T308ME-T				0.8	1.8				●			
 Small Edge	CPGB 080202SE	7.94	2.38	3.5	0.2	1.9	11°	1	○	○			162,164
	CPGB 080204SE				0.4	1.9			●	○			
	CPGB 090302SE	9.525	3.18	4.5	0.2	1.9	11°		○	○			
	CPGB 090304SE				0.4	1.9			○	○			
 Small Edge / Tough	CPGB 080204SE-T	7.94	2.38	3.5	0.4	1.9	11°	1		○			
	CPGB 090304SE-T	9.525	3.18	4.5	0.4	1.9	11°			○			
 Multi Edge / Tough	CPGB 080204ME-T	7.94	2.38	3.5	0.4	1.9	11°	2		○			
	CPGB 090304ME-T	9.525	3.18	4.5	0.4	1.9	11°			○			
	CPGB 080204	7.94	2.38	3.5	0.4	3.7	11°	1					
	CPGB 080208				0.8	3.6							
	CPGB 090304	9.525	3.18	4.5	0.4	3.7	11°		○	○			
	CPGB 090308				0.8	3.6			○	○			
 Small Edge	WBGW060102R/L-SE	3.97	1.59	2.3	0.2	1.9	5°	1	R	L			167,168
	WBGW060104R/L-SE				0.4	1.9			●	L			
	WBGW080202R/L-SE	4.76	2.38	2.3	0.2	2.3	5°		L	L			167～169
	WBGW080204R/L-SE				0.4	2.3			●	L			

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability L : Left-hand Only

■ Positive

Edge Preparation			
KBN10B / KBN25B / KBN65B : Without Indication, SE, S2E, S3E	0.08mm×15°+honing	KBN25B : SE-T, ME-T	0.10mm×35°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

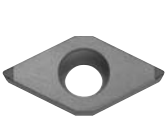
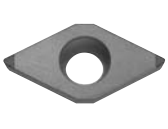
Shape	Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Small Edge / Tough	WBGW060104R/L-SE-T	3.97	1.59	2.3	0.4	1.9	5°	1		L			167,168
	WBGW080204R/L-SE-T	4.76	2.38	2.3	0.4	2.3	5°			L			169,170
 Small Edge / Tough	WPGW110204SE-T	6.35	2.38	2.8	0.4	1.9	11°	1		●			169,170
	WPGW160304SE-T 160308SE-T	9.525	3.18	4.4	0.4 0.8	1.9 1.8				● ●			
 Small Edge	TCMW110202SE 110204SE 110208SE	6.35	2.38	2.8	0.2 0.4 0.8	1.9 1.8 1.5	7°	1		● ● ●			-
 Small Edge	TPGB 080202SE 080204SE	4.76	2.38	2.5	0.2 0.4	1.8 1.7	11°	1	● ●	● ●			132 171～176
	TPGB 090202SE 090204SE	5.56	2.38	3.0	0.2 0.4	1.8 1.6	11°		● ●	● ●			171～176
	TPGB 110301SE 110302SE 110304SE 110308SE	6.35	3.18	3.5	0.1 0.2 0.4 0.8	1.7 1.9 1.8 1.5	11°		● ● ◎	 ○ ● ●			132 172～178
	TPGB 160302SE 160304SE	9.525	3.18	4.5	0.2 0.4	1.9 1.8	11°		○ ●	○ ○			172～178
 Small Edge / Tough	TPGB 080204SE-T	4.76	2.38	2.5	0.4	1.7	11°	1		○			132,171～6
	TPGB 090204SE-T	5.56	2.38	3.0	0.4	1.6	11°			○			171～176
	TPGB 110304SE-T 110308SE-T	6.35	3.18	3.5	0.4 0.8	1.8 1.5	11°			○ ●			132 172～178
	TPGB 160304SE-T 160308SE-T	9.525	3.18	4.5	0.4 0.8	1.8 1.5	11°			○ ○			172～178
 Multi Edge / Tough	TPGB 160304ME-T 160308ME-T	9.525	3.18	4.5	0.4 0.8	1.8 1.5	11°	3		○ ○			172～178
	TPGB 080202 080204	4.76	2.38	2.5	0.2 0.4	2.4 2.3	11°	1	○ ○	○ ○			132 171～176
	TPGB 090202 090204	5.56	2.38	3.0	0.2 0.4	2.9 2.8	11°		○ ○	○ ○			171～176
	TPGB 110302 110304 110308	6.35	3.18	3.5	0.2 0.4 0.8	3.9 3.8 3.5	11°		○ ○ ○	○ ○ ○			132 172～178
	TPGB 160302 160304 160308	9.525	3.18	4.5	0.2 0.4 0.8	4.0 3.8 3.5	11°		○ ○	○ ○			172～178
 Small Edge	TPGW 160404SE 160408SE	9.525	4.76	4.4	0.4 0.8	1.8 1.6	11°	1		○ ○			-
 Small Edge / Tough	TPGW 160404SE-T 160408SE-T	9.525	4.76	4.4	0.4 0.8	1.9 1.8	11°	1		○ ○			-

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

Positive

Edge Preparation			
KBN10B / KBN25B / KBN65B : Without Indication, SE, S2E, S3E	0.08mm×15°+honing	KBN25B : SE-T, ME-T	0.10mm×35°+honing

"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

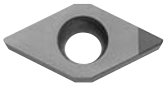
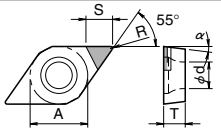
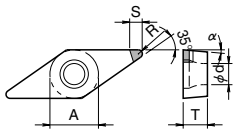
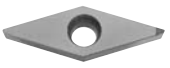
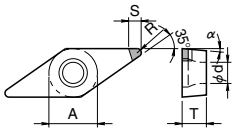
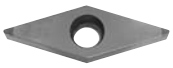
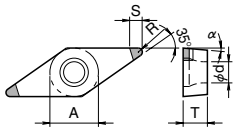
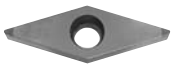
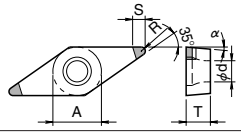
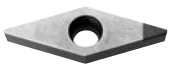
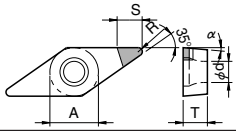
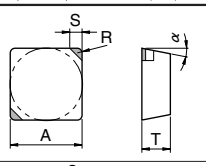
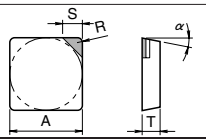
Shape	Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 Multi Edge / Tough	TPGW 160404ME-T	9.525	4.76	4.4	0.4	1.8	11°	3		○			-
	TPGW 160408ME-T				0.8	1.5				○			
 Small Edge	TPGN 110302SE	6.35	3.18	-	0.2	2.6	11°	1	○	●			133 179
	TPGN 110304SE				0.4	2.5			●	○			
	TPGN 110308SE				0.8	2.4			●	○			
	TPGN 160302SE	9.525	3.18	-	0.2	2.6	11°		○	○			
	TPGN 160304SE				0.4	2.4			○	●			
	TPGN 160308SE				0.8	2.1				●			
	TPGN 160312SE				1.2	2.1				●			
 Small Edge / Tough	TPGN 110304SE-T	6.35	3.18	-	0.4	2.5	11°	1		○			133 179
	TPGN 110308SE-T				0.8	2.4				○			
	TPGN 110304SE-T01520	6.35	3.18	-	0.4	1.9	11°		●				
	TPGN 110308SE-T01520				0.8	1.6			●				
	TPGN 160304SE-T	9.525	3.18	-	0.4	2.4	11°			○			
	TPGN 160308SE-T				0.8	2.1				○			
	TBGN 060102	3.97	1.59	-	0.2	-	5°	3	●	●			456
	TBGN 060104				0.4				●	●			
	TBGN 060108				0.8				●	●			
	TPGN 110304	6.35	3.18	-	0.4	3.8	11°	1	○	○			133 179
	TPGN 110308				0.8	3.5			○	○			
	TPGN 160304	9.525	3.18	-	0.4	3.9	11°	1	○	○			
	TPGN 160308				0.8	3.6				○			
	TPGN 160312				1.2	3.3				●			
 Small Edge	JCGW 030102SE	3.5	1.4	1.9	0.2	1.3	7°	1	●				180
 Small Edge	DCMW 070202SE	6.35	2.38	2.8	0.2	1.9	7°	1	●	●			
	DCMW 070204SE				0.4	1.7			●	○			
	DCMW 11T302SE	9.525	3.97	4.4	0.2	1.9	7°		○	○			
	DCMW 11T304SE				0.4	1.7			◎	○			
	DCMW 11T308SE				0.8	1.9			●	○			
 Small Edge / Tough	DCMW 070204SE-T	6.35	2.38	2.8	0.4	1.7	7°	1		○			134～138 182
	DCMW 11T302SE-T	9.525	3.97	4.4	0.2	1.9	7°			○			
	DCMW 11T304SE-T				0.4	1.7				○			
	DCMW 11T308SE-T				0.8	1.9				○			
	DCMW 110308SE-T00315	9.525	3.97	4.4	0.8	1.9	7°		●				
 Multi Edge	DCMW 070202S2E	6.35	2.38	2.8	0.2	1.9	7°	2	●	●			
	DCMW 070204S2E				0.4	1.7			●	●			
	DCMW 070208S2E				0.8	1.9				●			
	DCMW 11T302S2E	9.525	3.97	4.4	0.2	1.9	7°		●	●			
	DCMW 11T304S2E				0.4	1.7			●	●			
	DCMW 11T308S2E				0.8	1.9				●	●		
	DCMW 11T312S2E				1.2	1.9					●		
 Multi Edge / Tough	DCMW 070208ME-T	6.35	2.38	2.8	0.8	1.9	7°	2		●			134～138 182
	DCMW 11T302ME-T	9.525	3.97	4.4	0.2	1.9				●			
	DCMW 11T304ME-T				0.4	1.7				●			
	DCMW 11T308ME-T				0.8	1.9				●			
	DCMW 11T312ME-T				1.2	1.5				●			

●: Std. Stock(1pc Pack) ◎: Std. Stock(1pc Pack & 10pcs Pack) ○: Check Availability

■ Positive

Edge Preparation			
KBN10B / KBN25B / KBN65B : Without Indication, SE, S2E, S3E	0.08mm×15°+honing	KBN25B : SE-T, ME-T	0.10mm×35°+honing

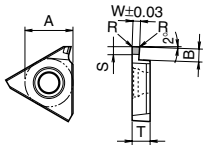
"SE" means 1-Corner Use with Standard Specification.
"S2E" means 2-Corner Use with Standard Specification.
"S3E" means 3-Corner Use with Standard Specification.
"SE-T" means 1-Corner Use with Tough Specification.
"ME-T" means Multiple-Corner Use with Tough Specification.

Shape		Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
		**DCMW 11T302**	9.525	3.97	4.4	0.2	3.7	7°	1	○	○			134～138
		11T304				0.4	3.5			●	○	○		182
		11T308				0.8	3.1			●		○		
 Small Edge		**VBGW 110302SE**	6.35	3.18	2.8	0.2	2.4	5°	1	○	○			140～142
		110304SE				0.4	2.0			●	○			184
		110308SE				0.8	1.7			○	○			
		VBGW 160402SE	9.525	4.76	4.4	0.2	2.4	5°		○	○			140～142
		160404SE				0.4	2.0			●	○			184
		160408SE				0.8	1.7			●	●			
		VBMW 160404SE	9.525	4.76	4.4	0.4	2.0	5°		●				
		160408SE				0.8	1.7			●				
		VCGW 080202SE	4.76	2.38	2.3	0.2	2.4	7°		●	○			184
		080204SE				0.4	2.0			●	○			
		080208SE				0.8	1.7							
 Small Edge / Tough		**VBGW 110304SE-T**	6.35	3.18	2.8	0.4	2.0	5°	1		○			140～142
		110308SE-T				0.8	1.7				○			184
		VBGW 160404SE-T	9.525	4.76	4.4	0.4	2.0	5°			○			140～142
		160408SE-T				0.8	1.7				●			184
		VCGW 080204SE-T	4.76	2.38	2.3	0.4	2.0	7°			○			184
		080208SE-T				0.8	1.8				○			
 Multi Edge		**VBGW 160404S2E**	9.525	4.76	4.4	0.4	2.0	5°	2		●			140～142
		160408S2E				0.8	1.7				●			184
		VCGW 080202S2E	4.76	2.38	2.3	0.2	2.0	7°		●				184
		080204S2E				0.4	2.0			●				
		080208S2E				0.8	1.7			●				
		VCGW 160408S2E	9.525	4.76	4.4	0.4	2.7	7°				●		140～142
		160412S2E				0.8	1.9					●		184
 Multi Edge / Tough		**VBGW 110304ME-T**	6.35	3.18	2.8	0.4	2.0	5°	2		●			140～142
		VBGW 160404ME-T	9.525	4.76	4.4	0.4	2.0	5°			●			184
		**VBMW 160404**	9.525	4.76	4.4	0.4	4.9	5°	1	●				140～142
		160408				0.8	4.0			●				184
 Multi Edge / Tough		**SPGN 120304ME-T**	12.70	3.18	-	0.4	1.8	11°	2		●			143,144 187
		**SPGN 090308**	9.525	3.18	-	0.8	4.1	11°	1	○				

Grooving Indexable Inserts · Tip-Bar [CBN]

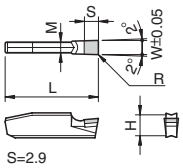
■ Grooving Inserts (1-Corner Use)

Edge Preparation	
Grooving Inserts (1-Corner Use)	R0.08mm honing

Shape (Right-hand Shown)	Description	Dimension (mm) W	B	R	A	T	φd	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 External / Internal Grooving 	GBA43R/L 125	1.25	2.0	0.2	12.70	4.76	5.5	1.9	1	R				208,209 236
	150	1.50	3.5							●				
	200	2.00	3.5							R				
	250	2.50	4.0							R				
	300	3.00	4.0							R				

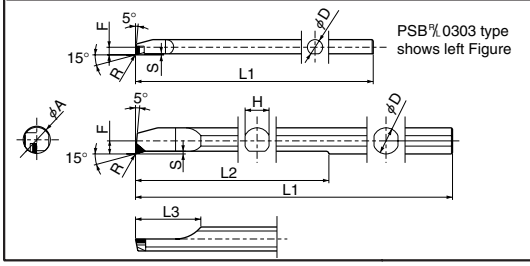
■ Deep Grooving Insert (1-Corner Use)

Edge Preparation	
Deep Grooving Insert (1-Corner Use)	R0.08mm honing

Shape	Description	Dimension (mm) W	R	L	H	M	S	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900	Ref. Page for Toolholder
 External Grooving  S=2.9	GMN 2	2.0	0.2	20	4.3	1.8	2.9	1	○				221～226
	3	3.0	0.4			2.3			●				
	4	4.0				3.3			●				
	5	5.0				4.2			●				
	6	6.0				5.2			○				

■ Tip-Bar

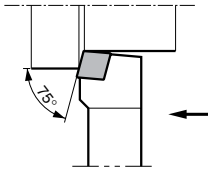
Edge Preparation	
Tip-Bar	0.08mm×15°

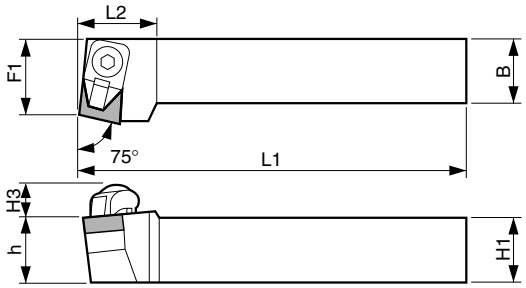
Shape (Right-hand Shown)	Description	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	L3	F	S	R	No. of Corner	Insert Grade CBN KBN10B	KBN25B	KBN65B	KBN900
 PSBR/L 0303 type shows left Figure	PSBR/L 0303-50NBS	3	2.8	-	50	-	7	1.4	0.3			R			
	0404-60NBS	4	3.8	3.6	60	30	10	1.9	0.5			R			
	0505-70NBS	5	4.8	4.4	70	40	12	2.4	0.5	0.05	1	R			
	0606-70NBS	6	5.8	5.2	70	45	12	2.9	0.5			R			
	0707-80NBS	7	6.8	6.2	80	50	12	3.4	0.5			R			

●: Std. Stock ○: Check Availability R : Right-hand Only

External Toolholders for Solid CBN Tools [CNMN Insert] Top Clamp

■ CCRN-A (External)

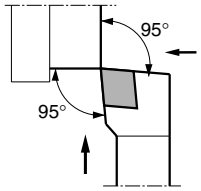


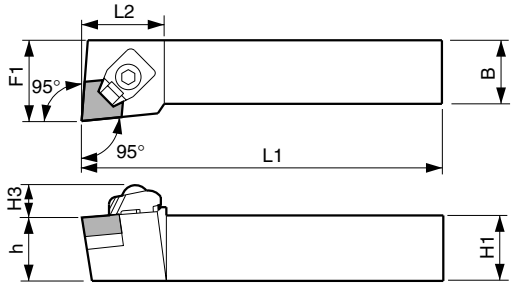


Side Rake Angle: -6°
Angle of Inclination: -6°

● Right-hand Shown

■ CCLN-A (External/Facing)





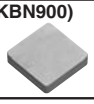
Side Rake Angle: -5°
Angle of Inclination: -5°

● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)						Std. Corner-R	Spare Parts			
	R	N	L	H1=h	H3	B	L1	L2	F1		Clamp Set	Wrench	Shim	Shim Screw
CCRN R/L 2525M-09A	○		○	25	11	25	150	27	27	0.8	**CE-030A**	**LW-4**	**SP-429**	**HH3X12**
CCLN R/L 2525M-09A	●		●	25	11	25	150	35	32	0.8	**CE-030A**	**LW-4**	**SP-429**	**HH3X12**
3225P-09A	○		○	32	11	25	170	35	32					

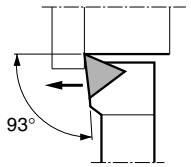
● Applicable Insert

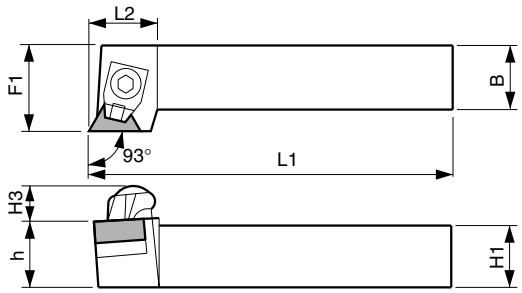
Application	High Hard Mat'l / Cast Iron
Ref. Page	442
Shape / Toolholder	**CBN(KBN900)** 
CCRN R/L ...-09A	CNMN0903..
CCLN R/L ...-09A	CNMN0903..

※ See Page 108 for Toolholder for CNMN1204 type Insert.

External Toolholders for Solid CBN Tools [TNMN Insert] Top Clamp

■ CTJN-A (External)

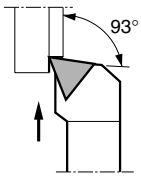


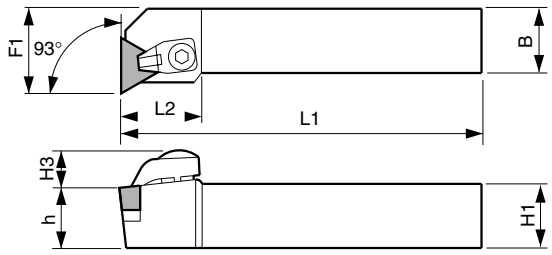


Side Rake Angle: -6°
Angle of Inclination: -4°

● Right-hand Shown

■ CTUN-A (Facing)

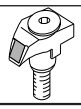




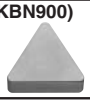
Side Rake Angle: -6°
Angle of Inclination: -4°

● Right-hand Shown

● Toolholder Dimension

Description	Stock			Dimension (mm)						Std. Corner-R	Spare Parts			
	R	N	L	H1=h	H3	B	L1	L2	F1		Clamp Set	Wrench	Shim	Shim Screw
														
CTJN R/L 2525M-11A	○		○	25	11	25	150	22	32	0.8	CE-030A	LW-4	SP-219	HH3X12
CTUN R/L 2525M-11A	○		○	25	11	25	150	28	32	0.8	CE-030A	LW-4	SP-219	HH3X12
3225P-11A	○			32	11	25	170	28	32					

● Applicable Insert

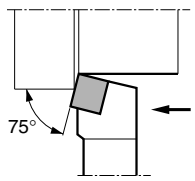
Application	High Hard Mat'l / Cast Iron	Cast Iron / High Hard Mat'l
Ref. Page	443	83
Shape / Toolholder	CBN(KBN900) 	Ceramic 
CTJN R/L ...-11A	TNMN1103..	TNGN1103..
CTUN R/L ...-11A	TNMN1103..	TNGN1103..

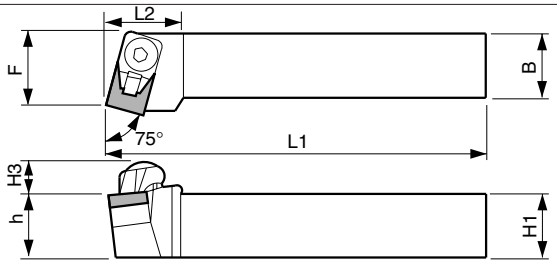
※ See Page 109 for Toolholder for TNMN1604 type Insert.

●: Std. Stock ○: Check Availability

External Toolholders for Solid CBN Tools [SNMN Insert] Top Clamp

CSRN-A (External)

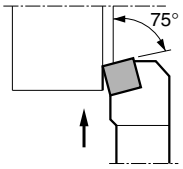


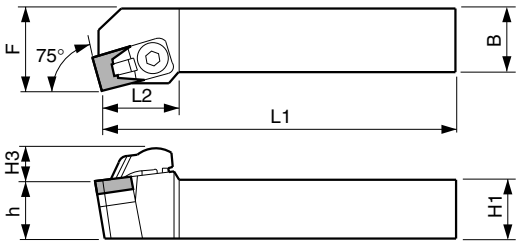


Side Rake Angle: -6°
Angle of Inclination: -4°

● Right-hand Shown

CSKN-A (Facing)

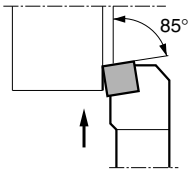


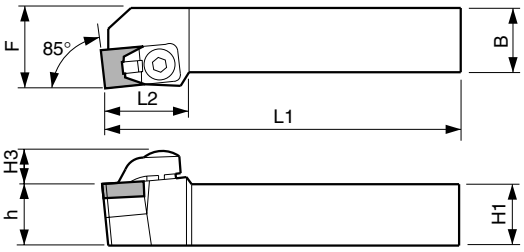


Side Rake Angle: -6°
Angle of Inclination: -4°

● Right-hand Shown

CSYN-A (Facing)





Side Rake Angle: -6°
Angle of Inclination: -4°

● Right-hand Shown

● Toolholder Dimension

Description		Stock			Dimension (mm)						Std. Corner-R	Spare Parts				
		R	N	L	H1=h	H3	B	L1	L2	F1		Clamp Set	Wrench	Shim		Shim Screw
CSRN R/L	2525M-09A	○		○	25	11	25	150	22	27	0.8	CE-030A	LW-4	SP-129	-	HH3X12
	2525M-12A	○		○	25	11	25	150	22	27				-	SP-148 (SP-143)	BH3X12
CSKN R/L	2525M-09A	○			25	11	25	150	27	32	0.8	CE-030A	LW-4	SP-129	-	HH3X12
	2525M-12A	○			25	11	25	150	27	32				-	SP-148 (SP-143)	BH3X12
CSYN R/L	2525M-09A	○		○	25	11	25	150	26	32	0.8	CE-030A	LW-4	SP-129	-	HH3X12
	2525M-12A	○		○	25	11	25	150	26	32				-	SP-148 (SP-143)	BH3X12

● Shim of -12A type Toolholder : When using SN□□1204 Insert, Prepare Spare Parts in ( ):SP-143 separately.

● Applicable Insert

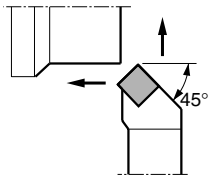
Application	High Hard Mat'l / Cast Iron	Cast Iron
Ref. Page	445	55
Shape / Toolholder	CBN(KBN900)	Coated/Cermet
CSRN R/L...-09A	SNMN0903..	-
CSRN R/L...-12A	SNMN1203.. (SNMN1204..)	(SNGN1204..) (SNMN1204..)
CSKN R/L...-09A	SNMN0903..	-
CSKN R/L...-12A	SNMN1203.. (SNMN1204..)	(SNGN1204..) (SNMN1204..)
CSYN R/L...-09A	SNMN0903..	-
CSYN R/L...-12A	SNMN1203.. (SNMN1204..)	(SNGN1204..) (SNMN1204..)

Cast Iron / High Hard Mat'l	When Using as Toolholder for Ceramic Tools, Prepare Spare Parts below separately.			
85	Chipbreaker	Clamp Set	Shim	Shim Screw
Ceramic				
-	-			
(SNGN1204..) (SNMN1204..)	CB-11	CE-020	SP-143	M3X12
(SNGN1207..) (SNMN1207..)			SP-141	M3X8
-	-			
(SNGN1204..) (SNMN1204..)	CB-11	CE-020	SP-143	M3X12
(SNGN1207..) (SNMN1207..)			SP-141	M3X8
-	-			
(SNGN1204..) (SNMN1204..)	CB-11	CE-020	SP-143	M3X12
(SNGN1207..) (SNMN1207..)			SP-141	M3X8

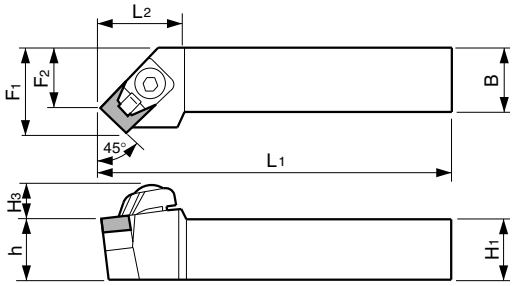
●: Std. Stock ○: Check Availability

External Toolholders for Solid CBN Tools [SNMN Insert] Top Clamp

■ CSSN-A (External/Facing/Chamfering)

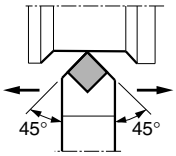


Side Rake Angle: -6°
Angle of Inclination: 0°

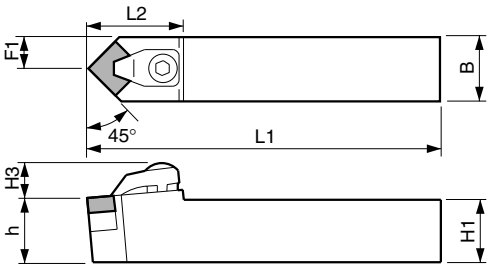


● Right-hand Shown

■ CSDN-A (External/Chamfering)



Back Rake Angle: -8.5°



● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	F2	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim		Shim Screw
CSSNR/L	2525M-09A	○		○	25	11	25	150	27	32	25	0.8	CE-030A	LW-4	SP-129	-	HH3X12
	2525M-12A	●		○	25	11	25	150	27	32	23				-	SP-148 (SP-143)	BH3X12
CSDNN	2525M-09A		○		25	13	25	150	33	12.5	-	0.8	CE-040	LW-4	SP-129	-	HH3X12
	3225P-09A		○		32	13	25	170	33	12.5	-						
	2525M-12A		○		25	13	25	150	33	12.5	-				-	SP-148 (SP-143)	BH3X12

● Shim of -12A type Toolholder : When using SN□□1204 Insert, Prepare Spare Parts in ( ):SP-143 separately.

● Applicable Insert

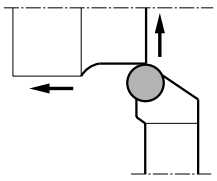
Application	High Hard Mat'l / Cast Iron	Cast Iron
Ref. Page	445	55
Shape / Toolholder	CBN(KBN900)	Coated/Cermet
CSSNR/L...-09A	SNMN0903..	-
CSSNR/L...-12A	SNMN1203.. (SNMN1204..)	(SNGN1204..) (SNMN1204..)
CSDNN...-09A	SNMN0903..	-
CSDNN...-12A	SNMN1203.. (SNMN1204..)	(SNGN1204..) (SNMN1204..)

Cast Iron / High Hard Mat'l	When Using as Toolholder for Ceramic Tools, Prepare Spare Parts below separately.			
85	Chipbreaker	Clamp Set	Shim	Shim Screw
Ceramic				
-	-			
(SNGN1204).. (SNMN1204..)	CB-11	CE-020	SP-143	M3X12
(SNGN1207).. (SNMN1207..)			SP-141	M3X8
-	-			
(SNGN1204).. (SNMN1204..)	-	-	SP-143	M3X12
(SNGN1207).. (SNMN1207..)			SP-141	M3X8

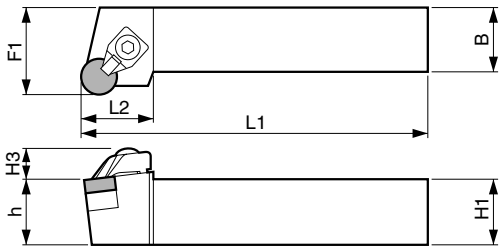
●: Std. Stock ○: Check Availability

External Toolholders for Solid CBN Tools [RNMN Insert] Top Clamp

■ CRSN-A (External/Facing)

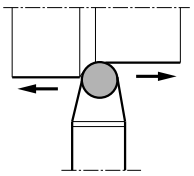


Side Rake Angle: -6°
Angle of Inclination: -6°

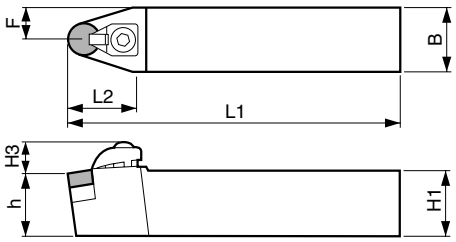


● Right-hand Shown

■ CRDN-A (External/Copying)



Back Rake Angle: -8.5°



● Toolholder Dimension

Description		Stock R	Stock N	Stock L	Dimension (mm) H1=h	H3	B	L1	L2	F1	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Shim	Shim Screw HH	Shim Screw BH
CRSN R/L	2525M-09A	○		○	25	11	25	150	26	32	-	CE-030A	LW-4	SP-829	-	HH3X12	
	3225P-09A	○		○	32	11	25	170	26	32							
	2525M-12A	●		○	25	11	25	150	26	32	-			-	SP-849 (SP-843)	BH3X12	
	3225P-12A	○		○	32	11	25	170	26	32							
CRDNN	2525M-09A		●		25	11	25	150	29	12.5	-	CE-030A	LW-4	SP-829	-	HH3X12	
	3225P-09A		●		32	11	25	170	29	12.5							
	2525M-12A		○		25	11	25	150	29	12.5	-			-	SP-849 (SP-843)	BH3X12	
	3225P-12A		●		32	11	25	170	29	12.5							

● Shim of -12A type Toolholder : When using RN□□1204 Insert, Prepare Spare Parts in ( ):SP-843 separately.

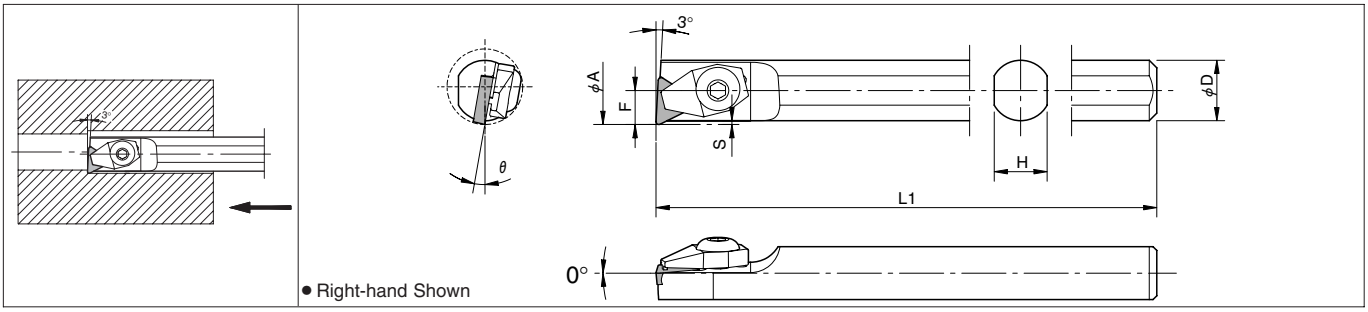
● Applicable Insert

Application	High Hard Mat'l / Cast Iron
Ref. Page	445
Shape / Toolholder	CBN(KBN900)
CRSN R/L...-09A	RNMN0903..
CRSN R/L...-12A	RNMN1203.. (RNMN1204..)
CRDNN...-09A	RNMN0903..
CRDNN...-12A	RNMN1203.. (RNMN1204..)

Cast Iron / High Hard Mat'l	When Using as Toolholder for Ceramic Tools, Prepare Spare Parts below separately.		
86			
Ceramic	Clamp Set	Shim	Shim Screw
(RNGN090400)	-	SP-826	-
(RNGN120400)	CE-030	SP-843	M3X12
(RNGN120700)		SP-841	M3X8
(RNGN090400)	-	SP-826	-
(RNGN120400)	-	SP-843	M3X12
(RNGN120700)		SP-841	M3X8

Boring Bars for Solid CBN Tools [TBGN, CNMN Insert] Top Clamp

■ S···CTXB-HM (Blind Hole Boring)



● Right-hand Shown

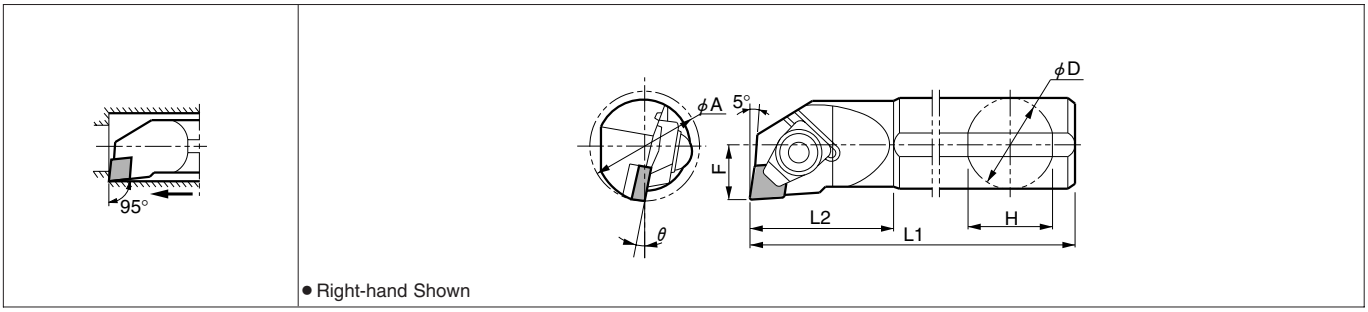
● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	F	S	θ	Std. Corner-R	Spare Parts Clamp	Screw	Wrench
S08L-CTXBR/L06-10HM	–	●		10	8	7	140	4.5	0.5	8°	0.4	CP-1DE	BH3X6	SW-2
S12N-CTXBR/L06-15HM		●		15	12	11	160	6.6	0.6	10°				

● Applicable Insert

Application	Cast Iron / High Hard Mat'l	Cast Iron / High Hard Mat'l	Non-ferrous Metal
Ref. Page	448	86	462
Shape / Toolholder	CBN(KBN10B/KBN25B)	Ceramic	Diamond
····CTXBR/L06····	TBGN0601..	TBGN0601..	TBGN0601..

■ S···CCLN-A (Boring / Internal Facing)



● Right-hand Shown

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts Clamp Set	Wrench	Shim	Shim Screw
S25X-CCLNR/L09-30A	CCLNR/L 3025B-09A	●	○	30	25	24	220	40	15	10°	0.8	CE-360S	LW-4	SP-420A	BH3X6
S32S-CCLNR/L09-40A	4032B-09A	○	○	40	32	30	250	50	22	8°					

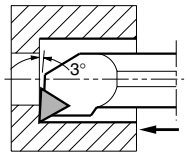
● Applicable Insert

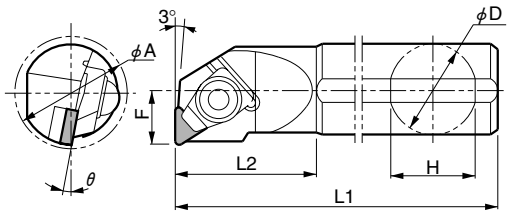
Application	High Hard Mat'l / Cast Iron
Ref. Page	442
Shape / Toolholder	CBN(KBN900)
····CCLNR/L09····	CNMN0903..

●: Std. Stock ○: Check Availability

Boring Bars for Solid CBN Tools [TNMN, SNMN Insert] Top Clamp

■ S···CTUN-A (Blind Hole Boring)





● Right-hand Shown

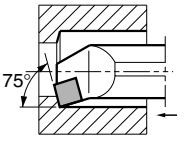
● Toolholder Dimension

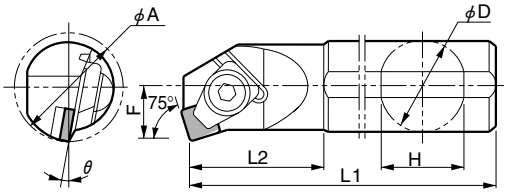
Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Shim Screw
S25X-CTUNR/L11-30A	CTUNR/L 3025B-11A	○		30	25	24	220	40	15	10°	0.8	CE-360S	LW-4	SP-210A	BH3X6

● Applicable Insert

Application	High Hard Mat'l / Cast Iron	Cast Iron / High Hard Mat'l
Ref. Page	443	83
Shape / Toolholder	CBN(KBN900)	Ceramic
----CTUNR/L11----	TNMN1103..	TNGN1103..

■ S···CSKN-A (Thru Boring)





● Right-hand Shown

● Toolholder Dimension

Description	(Old Description)	Stock R	Stock L	Min. Bore Dia. φA	Dimension (mm) φD	H	L1	L2	F	θ	Std. Corner-R	Spare Parts: Clamp Set	Wrench	Shim	Shim Screw
S25X-CSKNR/L09-30A	CSKNR/L 3025B-09A	○		30	25	24	220	40	15	10°	1.2	CE-360S	LW-4	SP-130A	BH3X12
S32S-CSKNR/L09-40A	4032B-09A	○		40	32	30	250	50	22	8°					

● Applicable Insert

Application	High Hard Mat'l / Cast Iron
Ref. Page	445
Shape / Toolholder	CBN(KBN900)
----CSKNR/L09----	SNMN0903..

※See Page 198 for Toolholder for SNMN1204 type Insert.

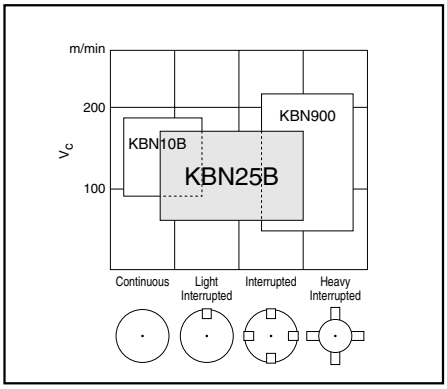
Grade Selection & Recommended Cutting Conditions [CBN]

CBN Grades and Features

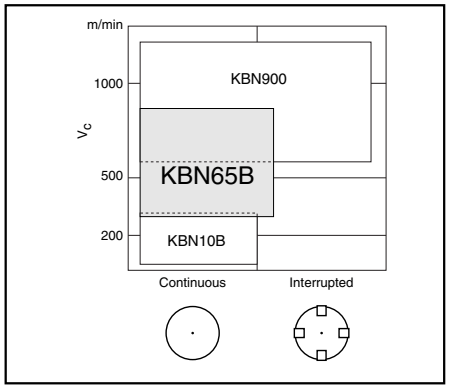
See Page 22 for Details

Grade Selection

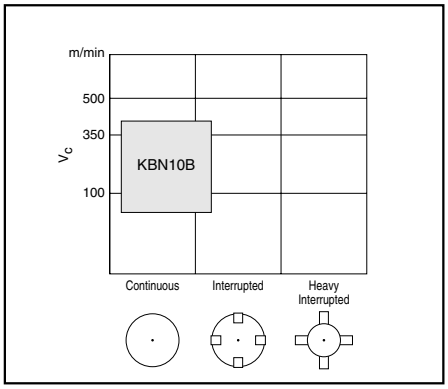
● High Hard Mat'l (Heat Treated Steel)



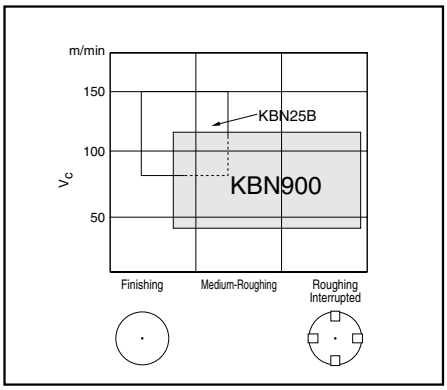
● Gray Cast Iron



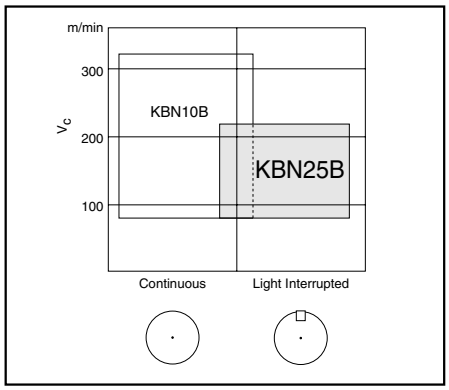
● Ductile Cast Iron



● Roll Material (Chilled Cast Iron)



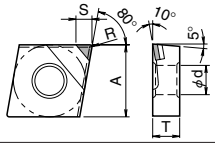
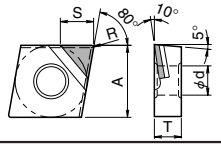
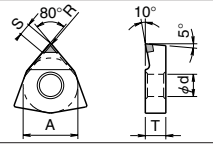
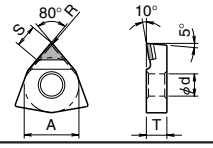
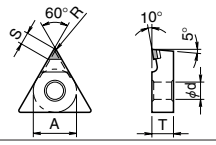
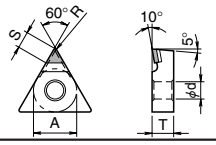
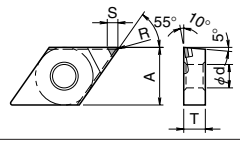
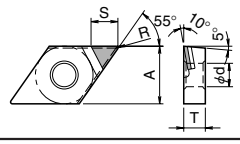
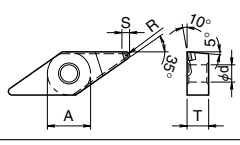
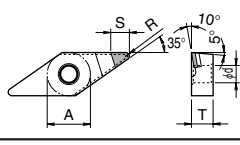
● Sintered Metal



Recommended Cutting Conditions

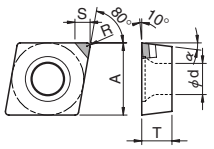
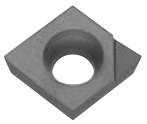
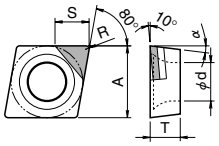
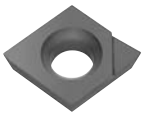
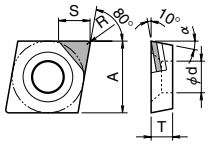
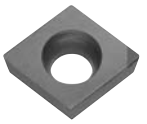
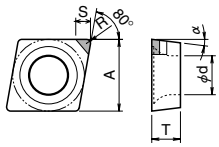
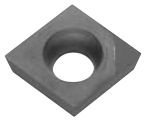
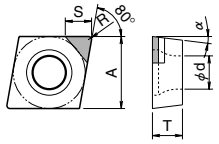
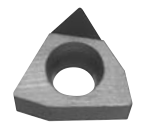
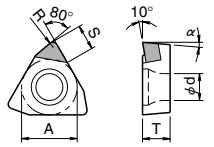
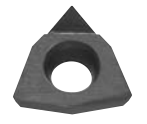
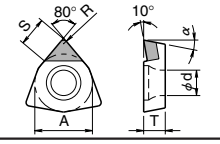
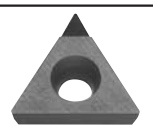
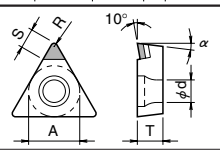
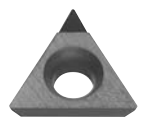
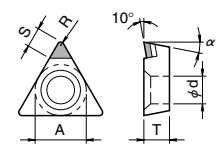
Work Material	Hardness	Application		Recommended Insert Grade	Cutting Condition		
					V_c (m/min)	a_p (mm)	f (mm/rev)
Heat Treated Steel	55HRC～	General Finishing	Continuous～Light Interrupted	KBN10B	120	0.3	0.08
		High Efficiency Stablle Cutting	Continuous～Interrupted	KBN25B	100	0.3	0.08
		Heavy	Continuous～Interrupted	KBN900	80	～2.0	0.2
	～55HRC	Finishing	Continuous	A66N	80	0.5	0.2
Gray Cast Iron		Finishing	Continuous～Light Interrupted	KBN65B	500	0.3	0.15
		High Efficiency Finishing	Continuous～Light Interrupted	KBN900	1000	0.5	0.3
		Heavy	Continuous～Interrupted	KBN900	700	2.0	0.4
Ductile Cast Iron		Finishing	Continuous～Light Interrupted	KBN10B	300	0.3	0.1
Roll Material (Chilled Cast Iron)	55HRC～	Finishing	Continuous～Interrupted	KBN25B	120	0.3	0.1
		Heavy	Continuous～Interrupted	KBN900	80	～2.0	0.3
Sintered Metal	～35HRC	Finishing	Continuous～Light Interrupted	KBN10B	300	0.3	0.1
	35HRC～	Finishing	Continuous～Interrupted	KBN25B	200	0.3	0.2

■ Negative

Shape		Description	Edge Preparation: Negative Insert / Sharp Edge — Dimension (mm) A	T	φd	R	S	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
Small Edge		CNMM 120402M-SE 120404M-SE 120408M-SE 120412M-SE	12.70	4.76	5.16	0.2 0.4 0.8 1.2	2.8 2.8 2.7 2.5	1		● ● ● ●		○ ○ ○	95 189
		CNMM 120402M 120404M 120408M 120412M	12.70	4.76	5.16	0.2 0.4 0.8 1.2	5.8 5.8 5.7 5.6	1	○	○ ● ○ ○		○ ○ ○	
Small Edge		WNMM 080402M-SE 080404M-SE 080408M-SE	12.70	4.76	5.16	0.2 0.4 0.8	2.8 2.8 2.7	1		○ ○ ○			96 191,192
		WNMM 080402M 080404M 080408M 080412M	12.70	4.76	5.16	0.2 0.4 0.8 1.2	5.8 5.8 5.7 5.6	1		○ ○			
Small Edge		TNMM 160402M-SE 160404M-SE 160408M-SE 160412M-SE	9.525	4.76	3.81	0.2 0.4 0.8 1.2	2.7 2.6 2.3 2.0	1		○ ● ● ●		○ ○ ○	97,98 194
		TNMM 160402M 160404M 160408M 160412M	9.525	4.76	3.81	0.2 0.4 0.8 1.2	3.8 3.6 3.3 3.0	1	○	○ ● ○ ●	○	○ ○ ○	
Small Edge		DNMM 150402M-SE 150404M-SE 150408M-SE	12.70	4.76	5.16	0.2 0.4 0.8	2.8 2.6 2.2	1		○ ○ ●		○ ○ ○	99
		DNMM 150402M 150404M 150408M 150412M	12.70	4.76	5.16	0.2 0.4 0.8 1.2	5.9 5.8 5.4 5.0	1		○ ● ● ○		○ ○ ○	
Small Edge		VNMM 160402M-SE 160404M-SE 160408M-SE	9.525	4.76	3.81	0.2 0.4 0.8	2.9 2.5 1.6	1		○ ○ ○		○ ○ ○	100,101
		VNMM 160402M 160404M 160408M 160412M	9.525	4.76	3.81	0.2 0.4 0.8 1.2	5.3 4.8 4.0 3.1	1		○ ○ ○ ○		○ ○ ○	

●: Std. Stock ○: Check Availability

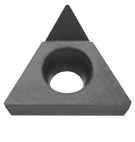
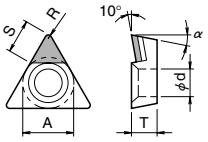
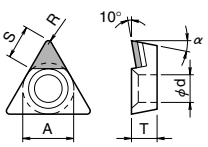
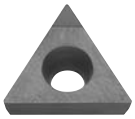
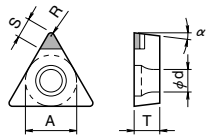
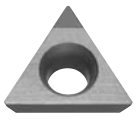
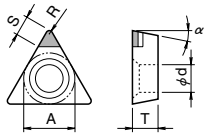
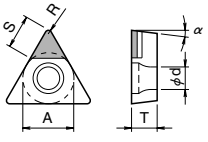
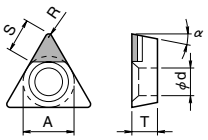
Positive

Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Edge Preparation: Positive Insert / Sharp Edge — Insert Grade Diamond: KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Small Edge 	CCMT 09T304SE	9.525	3.97	4.4	0.4	1.9	7°	1		●			130,131
	CCMT 09T308SE				0.8	1.8				●			164
	CCMT 120404SE	12.70	4.76	5.16	0.4	2.8	7°			●			131
	CCMT 120408SE				0.8	2.7				●			
 	CCMT 060201	6.35	2.38	2.8	0.1	3.3	7°			○		○	130,131
	CCMT 060202				0.2	3.3				○		○	162,164
	CCMT 060204				0.4	3.2				●		○	
	CCMT 09T301	9.525	3.97	4.4	0.1	3.9	7°	1		●		○	130,131
	CCMT 09T302				0.2	3.9			○	●		○	164
	CCMT 09T304				0.4	3.9			●	●		○	
	CCMT 09T308				0.8	3.8				○			
 	CPMH 080201	7.94	2.38	3.5	0.1	3.7	11°			○		○	162,164
	CPMH 080202				0.2	3.7				○		○	
	CPMH 080204				0.4	3.7			○	○	○	○	
	CPMH 080208				0.8	3.5				○			
	CPMH 090301	9.525	3.18	4.5	0.1	4.0		1		○		○	
	CPMH 090302				0.2	3.9				○		○	
	CPMH 090304				0.4	3.9			○	●		○	
	CPMH 090308				0.8	3.8				●			
 Small Edge 	CCGW 09T304SE	9.525	3.97	4.4	0.4	1.9	7°	1		●			130,131
	CCGW 09T308SE				0.8	1.8				●			164
 	CCGW 040101	4.3	1.8	2.3	0.1	1.9	7°			○		○	160,161
	CCGW 040102				0.2	1.9				●		○	
	CCGW 040104				0.4	1.9				●		○	
	CCGW 060201	6.35	2.38	2.8	0.1	3.5	7°	1		○			130,131
	CCGW 060202				0.2	3.5				○			162,164
	CCGW 060204				0.4	3.5				●			
	CCGW 09T301	9.525	3.97	4.4	0.1	3.8	7°			○		○	130,131
	CCGW 09T302				0.2	3.8				○		○	
	CCGW 09T304				0.4	3.7			○	○		○	164
	CCGW 09T308				0.8	3.6				○			
 	WBMT 060101L	3.97	1.59	2.3	0.1	1.9	5°			○		○	167,168
	WBMT 060102L				0.2	1.9			○	●		○	
	WBMT 060104L				0.4	1.9				●		○	
	WBMT 060108L				0.8	1.8		1		●			
	WBMT 080201L	4.76	2.38	2.3	0.1	2.4						○	167~169
	WBMT 080202L				0.2	2.4	5°			●		○	
	WBMT 080204L				0.4	2.3				○		○	
 	WPMT 110201	6.35	2.38	2.8	0.1	3.0	11°	1	○	○			169,170
	WPMT 110202				0.2	3.1				○			
	WPMT 110204				0.4	3.1				○			
 Small Edge 	TCMT 110301SE	6.35	3.18	2.8	0.1	2.6	7°	1		○			132
	TCMT 100302SE				0.2	2.5				○			
	TCMT 110304SE				0.4	2.4				○			
 Small Edge 	TPMH 110301SE	6.35	3.18	3.5	0.1	2.7	11°	1		○			132
	TPMH 110302SE				0.2	2.6				○		○	172~178
	TPMH 110304SE				0.4	2.5				●		○	
	TPMH 160301SE	9.525	3.18	4.5	0.1	2.6				○			
	TPMH 160302SE				0.2	2.6	11°			○		○	172~178
	TPMH 160304SE				0.4	2.4				○		○	

●: Std. Stock ○: Check Availability

■ Positive

Edge Preparation	
Positive Insert	Sharp Edge

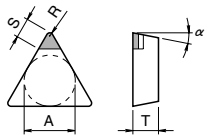
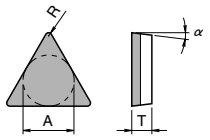
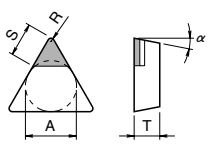
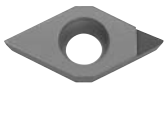
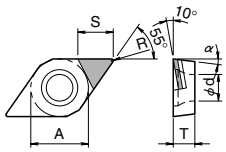
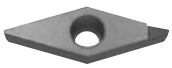
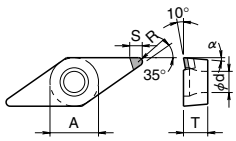
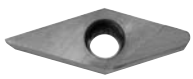
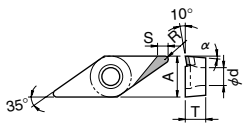
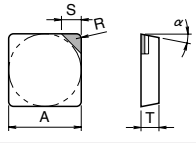
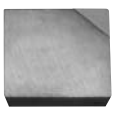
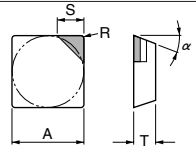
Shape		Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
		**TBMT 060101**	3.97	1.59	2.3	0.1	2.6	5°	1		○		○	170,171
		060102				0.2	2.5				●		○	
		060104				0.4	2.3				○		○	
		060108				0.8	2.0				○		○	
		TCMT 080201	4.76	2.38	2.3	0.1	2.4	7°			○			132
		080202				0.2	2.4				○			
		080204				0.4	2.2				○			
		080208				0.8	1.9				○			
		TCMT 110301	6.35	3.18	2.8	0.1	3.9	7°			○			
		110302				0.2	3.9				○			
		110304				0.4	3.7				○			
		110308				0.8	3.4				○			
		**TPMH 080201**	4.76	2.38	2.5	0.1	2.6	11°	1		○		○	132
		080202				0.2	2.5				●		○	171～176
		080204				0.4	2.3				○		○	
		080208				0.8	2.0				○		○	
		TPMH 090201	5.56	2.38	3.0	0.1	3.0	11°			○		○	171～176
		090202				0.2	2.9				○		○	
		090204				0.4	2.3				●		○	
		090208				0.8	2.5				○		○	
		TPMH 110301	6.35	3.18	3.5	0.1	3.9	11°		○	○		○	132
		110302				0.2	3.9				○		○	172～178
		110304				0.4	3.7				●		○	
		110308				0.8	3.4				○		○	
		TPMH 160301	9.525	3.18	4.5	0.1	4.1	11°			○		○	172～178
		160302				0.2	4.0				○		○	
		160304				0.4	3.8				○		○	
		160308				0.8	3.6				○		○	
 Small Edge		**TCGW 110301SE**	6.35	3.18	2.8	0.1	2.6	7°	1		○			132
		110302SE				0.2	2.5				○			
		110304SE				0.4	2.4				○			
 Small Edge		**TPGB 110301SE**	6.35	3.18	3.5	0.1	2.7	11°	1		○		○	132
		110302SE				0.2	2.6				○		○	172～178
		110304SE				0.4	2.5				○		○	
		TPGB 160301SE	9.525	3.18	4.5	0.1	2.6	11°			○		○	172～178
		160302SE				0.2	2.6				○		○	
		160304SE				0.4	2.4				○		○	
		**TBGW 060102**	3.97	1.59	2.3	0.2	2.4	5°	1		●		○	170,171
		060104				0.4	2.2				○		○	
		TCGW 110302	6.35	3.18	2.8	0.2	3.9	7°			○			132
		110304				0.4	3.7				●			
		110308				0.8	3.4				○			
		**TPGB 080202**	4.76	2.38	2.5	0.2	2.6	11°	1		●		○	132
		080204				0.4	2.4				●		○	171～176
		080208				0.8	2.2				○			
		TPGB 090202	5.56	2.38	3.0	0.2	3.2	11°			○		○	171～176
		090204				0.4	3.0				●		○	
		090208				0.8	2.7				○			
		TPGB 110302	6.35	3.18	3.5	0.2	3.9	11°		○	○	○	○	132
		110304				0.4	3.7				●	○	○	172～178
		110308				0.8	3.4				○	○	○	
		TPGB 160302	9.525	3.18	4.5	0.2	3.9	11°			○		○	172～178
		160304				0.4	3.7				○		○	
		160308				0.8	3.4				○		○	

●: Std. Stock ○: Check Availability

Turning Indexable Inserts [Diamond]

■ Positive

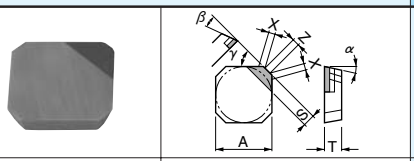
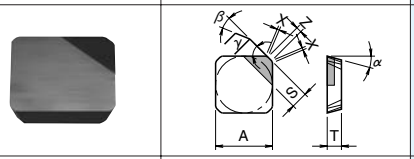
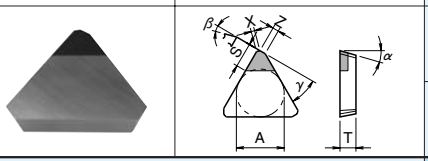
Edge Preparation: Positive Insert / Sharp Edge

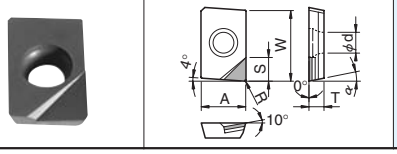
Shape (Handed Insert shows Left-hand)	Description	Dimension (mm) A	T	φd	R	S	Angle (°) α	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Small Edge 	TPGN 110301SE	6.35	3.18	-	0.1	2.6	11°	1		○		○	133 179
	TPGN 110302SE				0.2	2.5				○		○	
	TPGN 110304SE				0.4	2.4				●		○	
	TPGN 160301SE	9.525	3.18	-	0.1	2.6	11°			○			
	TPGN 160302SE				0.2	2.6				○		○	
	TPGN 160304SE				0.4	2.4				●		○	
 	TBGN 060102	3.97	1.59	-	0.2	-	5°	3		○			456
	TBGN 060104				0.4					○			
 	TPGN 090202	5.56	2.38	-	0.2	3.9	11°	1	○	○			179
	TPGN 090204				0.4	3.7				○			
	TPGN 090208				0.8	3.4				○			
	TPGN 110302	6.35	3.18	-	0.2	3.9	11°		○	○		○	133 179
	TPGN 110304				0.4	3.7				○	○	○	
	TPGN 110308				0.8	3.4				○			
	TPGN 160302	9.525	3.18	-	0.2	3.9	11°		○	○		○	
	TPGN 160304				0.4	3.7				○	○	○	
	TPGN 160308				0.8	3.4				○			
 	DCMT 070201	6.35	2.38	2.8	0.1	4.0	7°	1	○	○		○	134～138 182
	DCMT 070202				0.2	3.9				●	○	○	
	DCMT 070204				0.4	3.7				●		○	
	DCMT 11T301	9.525	3.97	4.4	0.1	4.0	7°		○	○		○	
	DCMT 11T302				0.2	3.9				●		○	
	DCMT 11T304				0.4	3.7			●	●		○	
	DCMT 11T308				0.8	3.3				●	○	○	
 	VBMT 110301	6.35	3.18	2.8	0.1	3.0	5°	1	○	○		○	140～142 184
	VBMT 110302				0.2	2.8				●		○	
	VBMT 110304				0.4	2.4				●		○	
	VBMT 110308				0.8	3.5				●		○	
	VBMT 160401	9.525	4.76	4.4	0.1	3.2	5°			○		○	
	VBMT 160402				0.2	3.0				●		○	
	VBMT 160404				0.4	2.6				●	○	○	
	VBMT 160408				0.8	3.5				●		○	
	VBMT 160412				1.2	3.3				●			
	VCMT 080201	4.76	2.38	2.3	0.1	1.9	7°			○			184
	VCMT 080202				0.2	1.9				○		○	
	VCMT 080204				0.4	1.9				○		○	
	VCMT 080208				0.8	1.9				○		○	
 	VCMW 160412R/L	9.525	4.76	4.4	1.2	4.4	7°	1		●			140～142 184
 	SPGN 120304	12.70	3.18	-	0.4	4.2	11°	1		○			143,144 187
 	SEGN 120304	12.70	3.18	-	0.4	4.2	20°	1		○			-

●: Std. Stock ○: Check Availability

Milling Inserts

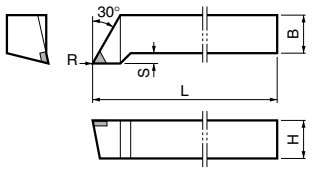
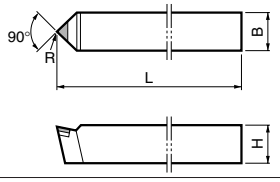
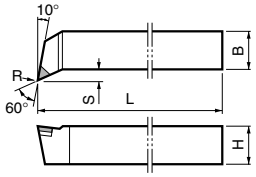
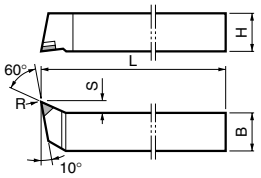
Edge Preparation: Milling Inserts — Sharp Edge

Shape (Handed Insert shows Right-hand)	Description	A	T	X	Z	S	α	β	γ	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Milling Cutter
	**SEEN 1203AFFN**	12.70	3.18	0.5	1.4	2.9	20°	25°	45°	1	○	●		○	346
	**SDKN 1203AUFN**	12.70	3.18	0.5	1.2	2.9	15°	23°	45°	1		○		○	348
	**TEEN 1603PTFR**	9.525	3.18	0.6	1.4	3.9	20°	22°	30°	1		○		○	389
	TEKN 2204PTFR	12.70	4.76	0.7	1.8	3.9	20°	22°	30°			○		○	354

Shape (Right-hand Shown)	Description	A	T	φd	W	R	S	α	β	γ	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Endmill
	**NDCW 150302FRX**	9.525	3.18	4.4	15.0	0.2	4.9	15°	-	-	1	○	○		○	388

JIS Standard Brazed Tool

Edge Preparation: JIS Standard Brazed Tool — Sharp Edge

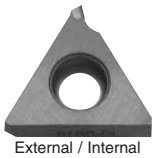
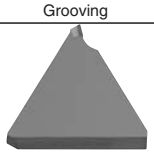
Shape	Description	H	B	L	S	R	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001
	**33 -0-R0.1**	10	10	80	-	0.1	1		○		
	-0	10	10	80	-	0.3			○		
	**35 -0-R0.1**	10	10	80		0.1			○		
	-0	10	10	80	-	0.3			○		
	-1-R0.1	13	13	100		0.1			○		
	**37 -0-R0.1**	10	10	80	3	0.1			○		
	-0	10	10	80	3	0.3			○		
	**38 -0-R0.1**	10	10	80	3	0.1			○		
	-0	10	10	80	3	0.3			○		

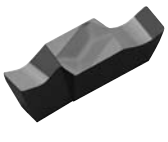
●: Std. Stock ○: Check Availability

Grooving Indexable Inserts [Diamond]

Grooving Inserts (1-Corner Use)

Edge Preparation: Grooving Inserts (1-Corner Use) — Sharp Edge

Shape (Right-hand Shown)	Description	Dimension (mm) W	B	R	A	T	φd	S	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 External / Internal Grooving	GBA32R/L 125	1.25	2.0	0.1	9.525	3.18	4.4	1.7	1		L			208,209
	150	1.50									R			
	GBA43R/L 125	1.25	2.0	0.1	12.70	4.76	5.5	1.9	1		○			208,209 236
	150	1.50	3.5								○		○	
	200	2.00	3.5								○		○	
	250	2.50	4.0								○		○	
	300	3.00	4.0								R		○	
 External Grooving	GB43R/L 125	1.25	2.0	0.1	12.70	4.76	-	1.9	1		○			209
	150	1.50	3.5								○			
	200	2.00									○			
	250	2.50	4.0								○			
	300	3.00									○			
 External Grooving	TGF32R/L 125	1.25	2.0	C0.1	9.525	3.18	4.5	1.7	1		R		R	212
	150	1.50									R		R	
	200	2.00	2.5					1.9			R		R	

Shape (Right-hand Shown)	Description	Dimension (mm) W	B	R	A	L	H	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Internal Grooving	GVR/L 145A	1.45	2.3	0.2	4.0	12	5.0	1		△			232
	200A	2.00								△			
	300A	3.00								△			
	GVR/L 200B	2.00	3.2	0.2	4.5	15	5.5			△			
	250B	2.50								△			
	300B	3.00	4.2							△			
	GVR/L 300C	3.00	4.5	0.2	5.8	21	6.5			△			
	400C	4.00	5.5							△			
 Face Grooving	GVFR/L 250B	2.50	4.8	0.2	5.8	20	5.0	1		△			249～255
	300B	3.00								△			
	400B	4.00	5.3							△			
	GVFR/L 350C	3.50	6.8	0.4	7.0	27	7.0			△			
	400C	4.00								△			

Deep Grooving Insert (1-Corner Use)

Edge Preparation: Deep Grooving Insert (1-Corner Use) — Sharp Edge

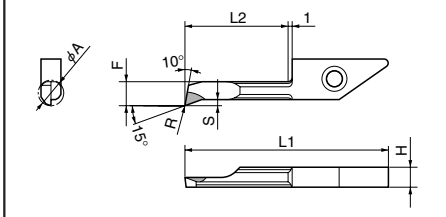
Shape	Description	Dimension (mm) W	R	L	H	M	S	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 External Grooving	GMN 2	2.0	0.2	20	4.3	1.8	2.9	1		○		○	221～255
	3	3.0				2.3				●		○	
	4	4.0				3.3				○		○	
	5	5.0				4.2				●		○	
	6	6.0				5.2				○			

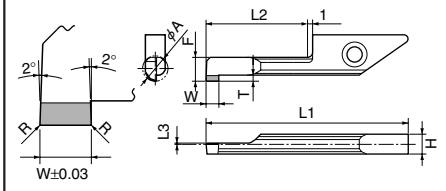
S=2.9

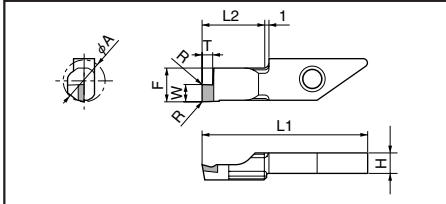
●: Std. Stock ○: Check Availability R : Right-hand Only △: Made-to-Order

System Tip-Bar

Edge Preparation: System Tip-Bar / Sharp Edge

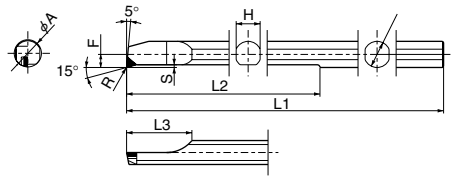
Shape (Right-hand Shown)	Description	Min. Bore Dia. φA	H	L1	L2	F	S	R	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Micro Boring -NB type (Without Chipbreaker)	VNBR 0411-02NB	4	3.9	30.8	11	3.5	0.5	0.2	1		R		R	154〜157
	0420-02NB			39.8	20						R		R	
	VNBR 0511-02NB	5	3.9	30.8	11	4.5	0.7	0.2			R		R	
	0520-02NB			39.8	20						R		R	
	VNBR 0620-02NB	6	3.9	39.8	20	5.3	1.0	0.2			R		R	
	0630-02NB			49.8	30						R		R	
	VNBR 0720-02NB	7	3.9	39.8	20	6.2	1.0	0.2			R		R	
	0730-02NB			49.8	30						R		R	

Shape (Right-hand Shown)	Description	Min. Bore Dia. φA	W	R	H	L1	L2	L3	F	T	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Micro Internal Grooving -NB type (Without Chipbreaker)	VNGR 0410-11NB	4	1.0	0.05	3.9	30.8	11	0.1	3.5	0.8	1		△			156,157 230
	0420-11NB		2.0	0.10									△			
	VNGR 0510-11NB	5	1.0	0.05	3.9	30.8	11	0.1	4.4	1.0			△			
	0520-11NB		2.0	0.10									△			
	VNGR 0610-20NB	6	1.0	0.05	3.9	39.8	20	0.3	5.2	1.8			△			
	0620-20NB		2.0	0.10									△			
	VNGR 0710-20NB	7	1.0	0.05	3.9	39.8	20	0.3	6.2	2.0			△			
	0720-20NB		2.0	0.10									△			

Shape (Right-hand Shown)	Description	Min. Bore Dia. φA	W	R	H	L1	L2	F	T	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001	Ref. Page for Toolholder
 Micro Face Grooving -NB type (Without Chipbreaker)	VNFGR 0810-20NB	8	1.0	0.05	3.9	39.8	20	7.3	2.0	1		△			156,157 245
	0820-20NB	8	2.0	0.05	3.9	39.8	20	7.3	2.0			△			
	0830-20NB	8	3.0	0.05	3.9	39.8	20	7.3	2.0			△			

Tip-Bar

Edge Preparation: Tip-Bar / Sharp Edge

Shape (Right-hand Shown)	Description	Min. Bore Dia. φA	φD	H	L1	L2	L3	F	S	R	No. of Corner	Insert Grade Diamond KPD025	KPD010	KPD002	KPD001
	PSB R/L 0303-50NBS	3	2.8	-	50	-	7	1.4	0.3				-		-
	0404-60NBS	4	3.8	3.6	60	30	10	1.9	0.5				R		R
	0505-70NBS	5	4.8	4.4	70	40	12	2.4	0.5	0.05	1		R		R
	0606-70NBS	6	5.8	5.2	70	45	12	2.9	0.5				R		R
	0707-80NBS	7	6.8	6.2	80	50	12	3.4	0.5				R		R

PCD Grades / Recommended Cutting Conditions

■ PCD Grades and Features

Insert Grade	Application	Features	Insert Grade	Application	Features
KPD001 (ave. Grain Size under 1 μm)	· High Speed Machining of Non-ferrous Metals like Aluminium Alloy · Fibered Glass, Plastics · High Hard Metal, Ceramics	· Highest Class Micro-Grain Diamond · Strong Edge and Wear Resistance, Crack Resistance, Edge Sharpening	**KPD010** (ave. Grain Size 10 μm)	· High Speed Machining of Non-ferrous Metals like Aluminium Alloy · Fibered Glass, Plastic · High Hard Metal, Ceramics	· God Balance of Wear Resistance, and Toughness · General Purpose
KPD002 (ave. Grain Size 1 μm)	· Rough Interrupted Cutting of Non-ferrous Metals · Plastics, Wood, Board	· Good Edge Sharpening, Good Surface Finish · High Toughness and Roughing available	**KPD025** (ave. Grain Size 25 μm)	· High Speed Machining of High Silicon Alloy · High Hard Metals, Ceramics	· Good Wear Resistance · High Damond Contents

■ Recommended Cutting Conditions

Work Material	Recommended Insert Grade	V_C (m/min)	a*p* (mm)	f (mm/rev)	Remarks
Aluminium Alloy	**KPD001** **KPD010** KPD025	300～1000	～3.0	0.05～0.5	Both Dry and Wet Cutting Available
Copper, Brass, Bronze	**KPD001** **KPD010**	300～1000	～3.0	0.05～0.5	
Sinterd Tungsten Carbide	**KPD001** **KPD010** KPD025	10～30	～2.0	0.1～0.2	
Titanium Alloy	**KPD001** **KPD010**	50～100	～2.0	0.05～0.1	Wet Cutting
Fiberglass Reinforced Plastics	**KPD001** KPD002 **KPD010**	100～600	～3.0	0.05～0.5	Dry Cutting
Silicated Plastics	**KPD001** KPD002 **KPD010**	400～800	～2.0	0.1～0.5	Dry Cutting

KPD Tool can be applied to Zinc, Magnesium Alloy, Carbon-fiber-composite, Rubber, Plastic Board, etc.

Finemicro Drill

467～470

High Precision
High Performance
High Reliability

For Micro-Dia. Metalworking

Finemicro Drill

**Finemicro Drill is the micro-diameter drill for metalworking application, born from the harmony of Kyocera's information communication/electronic part's technology and the metalworking tool "CERATIP"'s high precision machining technology.
It is available from diameter 0.1mm for metalworking purpose.**

Advantages

1. Stable cutting edge strength and great improvement of breakage resistance are realized due to the new and tough super micro-grain carbide material.
2. Equal high quality edge shape is realized due to Kyocera's fine grinding technology.
3. High efficiency and long tool life drilling is realized due to newly developed super-thin and high performance coat film (FS Coat).

※ FS of "FS Coat" means Fine Surface and it is the coat film with low friction, smooth surface and high wear resistance. It also contributes to sharp cutting performance and good chip evacuation.

FDM

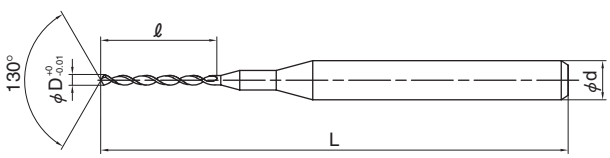


Fig.1

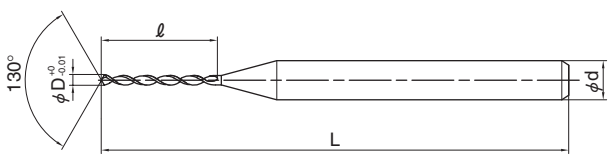


Fig.2

Material: Super Micro-grain Carbide Coat Film: FS Coat (TiAlN)

● Finemicro Drill Dimension

Description	Dimension (mm)				Shape	Grade	
	Drill Dia.	Flute Length	Overrall Length	Shank Dia.		Coated	Uncoated
	ϕD	ℓ	L	ϕd		FSA	A
FDM -010M(1) -010(1) -010	0.10	1.3	38.1	3.0 3.175	Fig. 1		
FDM -011M(1) -011(1) -011	0.11	1.3	38.1	3.0 3.175			
FDM -012M(1) -012(1) -012	0.12	1.5	38.1	3.0 3.175			
FDM -013M(1) -013(1) -013	0.13	1.5	38.1	3.0 3.175			
FDM -014M(1) -014(1) -014	0.14	1.7	38.1	3.0 3.175			
FDM -015M(1) -015(1) -015	0.15	1.7	38.1	3.0 3.175			
FDM -016M(1) -016(1) -016	0.16	1.9	38.1	3.0 3.175			
FDM -017M(1) -017(1) -017	0.17	1.9	38.1	3.0 3.175			
FDM -018M(1) -018(1) -018	0.18	2.2	38.1	3.0 3.175			
FDM -019M(1) -019(1) -019	0.19	2.2	38.1	3.0 3.175			
FDM -020M(1) -020(1) -020	0.20	2.4	38.1	3.0 3.175			
FDM -021M(1) -021(1) -021	0.21	2.4	38.1	3.0 3.175			
FDM -022M(1) -022(1) -022	0.22	2.7	38.1	3.0 3.175			
FDM -023M(1) -023(1) -023	0.23	2.7	38.1	3.0 3.175			
FDM -024M(1) -024(1) -024	0.24	2.9	38.1	3.0 3.175			
FDM -025M(1) -025(1) -025	0.25	2.9	38.1	3.0 3.175			
FDM -026M(1) -026(1) -026	0.26	3.1	38.1	3.0 3.175			
FDM -027M(1) -027(1) -027	0.27	3.1	38.1	3.0 3.175			
FDM -028M(1) -028(1) -028	0.28	3.3	38.1	3.0 3.175			
FDM -029M(1) -029(1) -029	0.29	3.3	38.1	3.0 3.175			
FDM -030M(1) -030(1) -030	0.30	5.0	38.1	3.0 3.175			

Description	Dimension (mm)				Shape	Grade	
	Drill Dia.	Flute Length	Overrall Length	Shank Dia.		Coated	Uncoated
	ϕD	ℓ	L	ϕd		FSA	A
FDM -031M(1) -031(1) -031	0.31	5.0	38.1	3.0 3.175	Fig. 1		
FDM -032M(1) -032(1) -032	0.32	5.0	38.1	3.0 3.175			
FDM -033M(1) -033(1) -033	0.33	5.0	38.1	3.0 3.175			
FDM -034M(1) -034(1) -034	0.34	5.0	38.1	3.0 3.175			
FDM -035M(1) -035(1) -035	0.35	5.0	38.1	3.0 3.175			
FDM -036M(1) -036(1) -036	0.36	6.0	38.1	3.0 3.175			
FDM -037M(1) -037(1) -037	0.37	6.0	38.1	3.0 3.175			
FDM -038M(1) -038(1) -038	0.38	6.0	38.1	3.0 3.175			
FDM -039M(1) -039(1) -039	0.39	6.0	38.1	3.0 3.175	Fig. 2		
FDM -040M(1) -040(1) -040	0.40	7.0	38.1	3.0 3.175			
FDM -041M(1) -041(1) -041	0.41	7.0	38.1	3.0 3.175			
FDM -042M(1) -042(1) -042	0.42	7.0	38.1	3.0 3.175			
FDM -043M(1) -043(1) -043	0.43	7.0	38.1	3.0 3.175			
FDM -044M(1) -044(1) -044	0.44	7.0	38.1	3.0 3.175			
FDM -045M(1) -045(1) -045	0.45	7.0	38.1	3.0 3.175			
FDM -046M(1) -046(1) -046	0.46	7.0	38.1	3.0 3.175			
FDM -047M(1) -047(1) -047	0.47	7.0	38.1	3.0 3.175			
FDM -048M(1) -048(1) -048	0.48	7.0	38.1	3.0 3.175			
FDM -049M(1) -049(1) -049	0.49	7.0	38.1	3.0 3.175			
FDM -050M(1) -050(1) -050	0.50	7.0	38.1	3.0 3.175			

FDM-○○○M (1)

- ○○○ : Drill Dia.
- M : Shank Dia 3.0mm / No Symbol : Shank Dia 3.175mm
- (1) : 1-pc Pack / No Symbol : 10-pc Pack

Recommended Cutting Conditions

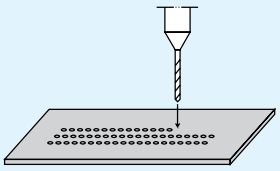
■ Recommended Cutting Conditions

	General Steel		Stainless Steel		Cast Iron		Aluminum/Copper Alloy	
Drill Dia. (mm)	V_C (m/min)	f (mm/rev)	V_C (m/min)	f (mm/rev)	V_C (m/min)	f (mm/rev)	V_C (m/min)	f (mm/rev)
0.10～0.19	2～6	0.0005～0.002	2～6	0.0003～0.001	2～10	0.0005～0.003	4～15	0.0005～0.003
0.20～0.29	4～10	0.001～0.004	4～10	0.0005～0.002	5～15	0.001～0.005	10～20	0.001～0.005
0.30～0.50	6～15	0.002～0.010	6～10	0.001～0.005	10～20	0.004～0.015	15～30	0.004～0.015

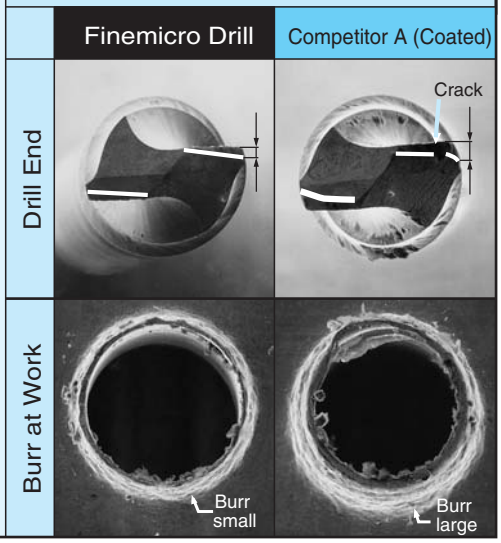
Caution
· The above conditions depend on the work hardness and machine.
· Use coolant. Oil base coolant is recommended.
· Use accurate drill chuck and make overhang length as short as possible.
· Use step feed drilling when the drilling depth exceeds 3XD value.
The depth per step shall be 10~50% of the drill dia. and the deeper the hole depth becomes, the shorter the depth per step shall be set up.

■ Case Study

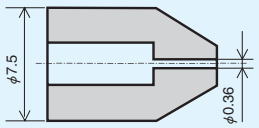
Cutting Conditions
Work Material : SUS304 (t=0.5mm)
Drill Dia. : ϕ0.3mm FDM-030 (FSA)
Cutting Speed : V_C=10m/min (N=10,600min^{-1})
Feed Rate : f=0.001mm/rev
Depth : 0.5mm
Step feed depth : 0.025mm
Hole machined : 200
Wet Cutting

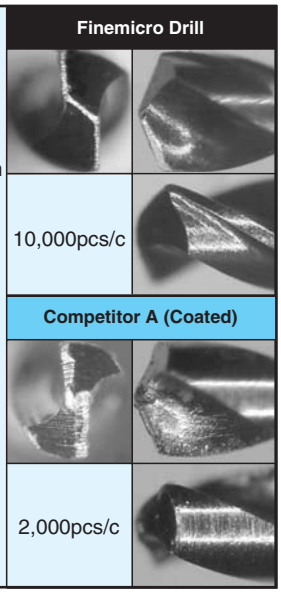


Condition after drilling 200 holes



Cutting Conditions
Work Material : SCM415
Drill Dia. : ϕ0.36mm FDM-036 (FSA)
Cutting Speed : V_C=4.5m/min (N=4,000min^{-1})
Feed Rate : f=0.01mm/rev
Depth : 1.7mm
Wet Cutting



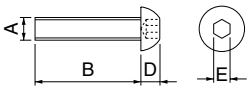
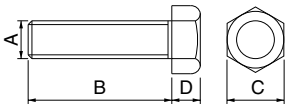
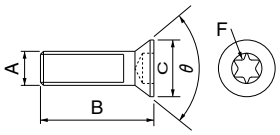
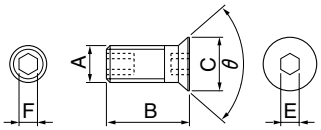
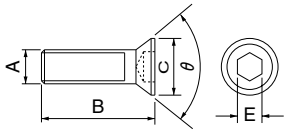
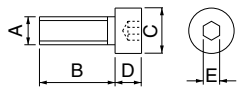


● : Std. Stock ○ : Check Availability

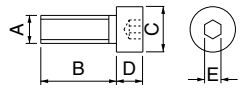
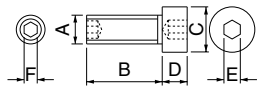
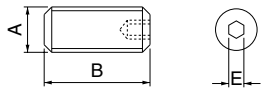
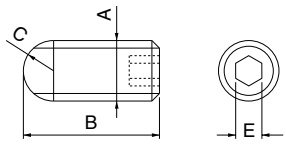
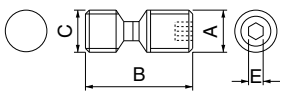
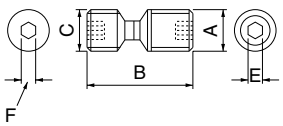
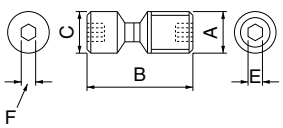
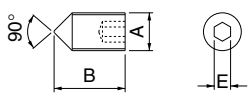
Spare Parts

471~486

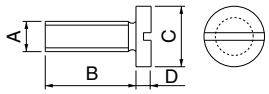
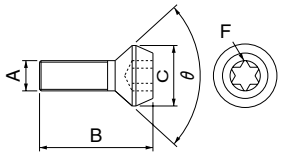
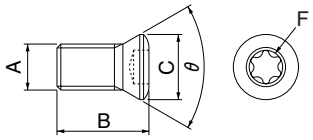
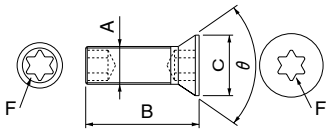
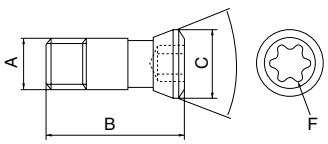
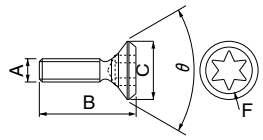
Screw

Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	BH	3X6	M3X0.5	6.0	-	1.7	2.0	-	-	-	
		3X12	M3X0.5	12.0	-	1.7	2.0	-	-	-	
		6X25	M6X1.0	25.0	-	3.3	4.0	-	-	-	
		8X30	M8X1.25	30.0	-	4.4	5.0	-	-	-	
	BM	4X9	M4X0.7	9.0	7.0	2.8	-	-	-	-	
	GS	-40TR	M4X0.7	10.0	5.8	-	-	T10	-	82°	
	GS	-4090TR/LW	M4X0.7	9.0	5.8	-	2.0	2.0	-	82°	R shows Right-hand Thread L shows Left-hand Thread
	GS	-50	M5X0.8	13.0	7.5	-	3.0	-	-	82°	
		-50S	M5X0.8	9.0	7.5	-	3.0	-	-	82°	
	HH	3X6	M3X0.5	6.0	5.5	3.0	2.5	-	-	-	
		3X12	M3X0.5	12.0	5.5	3.0	2.5	-	-	-	
	HH	4X16	M4X0.7	16.0	7.0	4.0	3.0	-	-	-	
	HH	5X15	M5X0.8	15.0	8.5	5.0	4.0	-	-	-	
		5X16	M5X0.8	16.0	8.5	5.0	4.0	-	-	-	
		5X20	M5X0.8	20.0	8.5	5.0	4.0	-	-	-	
		5X25	M5X0.8	25.0	8.5	5.0	4.0	-	-	-	
	HH	6X12	M6X1.0	12.0	10.0	6.0	5.0	-	-	-	
		6X20	M6X1.0	20.0	10.0	6.0	5.0	-	-	-	
		6X25	M6X1.0	25.0	10.0	6.0	5.0	-	-	-	
		6X30	M6X1.0	30.0	10.0	6.0	5.0	-	-	-	
	HH	8X35	M8X1.25	35.0	13.0	8.0	6.0	-	-	-	
		8X40	M8X1.25	40.0	13.0	8.0	6.0	-	-	-	
		8X50	M8X1.25	50.0	13.0	8.0	6.0	-	-	-	
		8X55	M8X1.25	55.0	13.0	8.0	6.0	-	-	-	
		8X65	M8X1.25	65.0	13.0	8.0	6.0	-	-	-	
		8X70	M8X1.25	70.0	13.0	8.0	6.0	-	-	-	
		8X80	M8X1.25	80.0	13.0	8.0	6.0	-	-	-	
		8X85	M8X1.25	85.0	13.0	8.0	6.0	-	-	-	
		8X100	M8X1.25	100.0	13.0	8.0	6.0	-	-	-	
		8X110	M8X1.25	110.0	13.0	8.0	6.0	-	-	-	
	HH	10X25	M10X1.5	25.0	16.0	10.0	8.0	-	-	-	
		10X30	M10X1.5	30.0	16.0	10.0	8.0	-	-	-	
	HH	12X25	M12X1.75	25.0	18.0	12.0	10.0	-	-	-	
		12X30	M12X1.75	30.0	18.0	12.0	10.0	-	-	-	
		12X40	M12X1.75	40.0	18.0	12.0	10.0	-	-	-	
		12X55	M12X1.75	55.0	18.0	12.0	10.0	-	-	-	
		12X65	M12X1.75	65.0	18.0	12.0	10.0	-	-	-	
		12X80	M12X1.75	80.0	18.0	12.0	10.0	-	-	-	
		12X85	M12X1.75	85.0	18.0	12.0	10.0	-	-	-	
		12X100	M12X1.75	100.0	18.0	12.0	10.0	-	-	-	
		12X110	M12X1.75	110.0	18.0	12.0	10.0	-	-	-	
		12X120	M12X1.75	120.0	18.0	12.0	10.0	-	-	-	
		12X130	M12X1.75	130.0	18.0	12.0	10.0	-	-	-	
		12X140	M12X1.75	140.0	18.0	12.0	10.0	-	-	-	
		12X150	M12X1.75	150.0	18.0	12.0	10.0	-	-	-	
	HH	16X40	M16X2.0	40.0	24.0	16.0	14.0	-	-	-	
		16X45	M16X2.0	45.0	24.0	16.0	14.0	-	-	-	
		16X65	M16X2.0	65.0	24.0	16.0	14.0	-	-	-	
		16X90	M16X2.0	90.0	24.0	16.0	14.0	-	-	-	
		16X110	M16X2.0	110.0	24.0	16.0	14.0	-	-	-	
		16X130	M16X2.0	130.0	24.0	16.0	14.0	-	-	-	

Screw

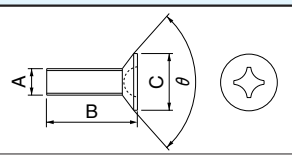
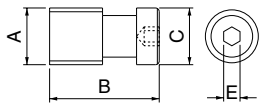
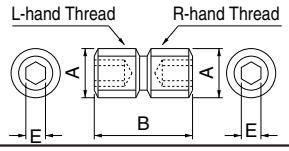
Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	HH	20X40	M20X2.5	40.0	30.0	20.0	17.0	-	-	-	
		20X55	M20X2.5	55.0	30.0	20.0	17.0	-	-	-	
		20X75	M20X2.5	75.0	30.0	20.0	17.0	-	-	-	
		20X90	M20X2.5	90.0	30.0	20.0	17.0	-	-	-	
		20X110	M20X2.5	110.0	30.0	20.0	17.0	-	-	-	
		20X120	M20X2.5	120.0	30.0	20.0	17.0	-	-	-	
		20X140	M20X2.5	140.0	30.0	20.0	17.0	-	-	-	
		20X150	M20X2.5	150.0	30.0	20.0	17.0	-	-	-	
		20X170	M20X2.5	170.0	30.0	20.0	17.0	-	-	-	
	HH	24X40	M24X3.0	40.0	36.0	24.0	19.0	-	-	-	
		24X60	M24X3.0	60.0	36.0	24.0	19.0	-	-	-	
		24X75	M24X3.0	75.0	36.0	24.0	19.0	-	-	-	
		24X90	M24X3.0	90.0	36.0	24.0	19.0	-	-	-	
		24X110	M24X3.0	110.0	36.0	24.0	19.0	-	-	-	
		24X120	M24X3.0	120.0	36.0	24.0	19.0	-	-	-	
		24X140	M24X3.0	140.0	36.0	24.0	19.0	-	-	-	
		24X150	M24X3.0	150.0	36.0	24.0	19.0	-	-	-	
		24X170	M24X3.0	170.0	36.0	24.0	19.0	-	-	-	
	HH	4X12	M4X0.7	12.0	7.0	4.0	3.0	2.0	-	-	
	HS	3X4	M3X0.5	4.0	-	-	1.5	-	-	-	Equivalent to JIS B1177
		3X8	M3X0.5	8.0	-	-	1.5	-	-	-	
		3X12	M3X0.5	12.0	-	-	1.5	-	-	-	
		3X16	M3X0.5	16.0	-	-	1.5	-	-	-	
		4X4	M4X0.7	4.0	-	-	2.0	-	-	-	
		5X5	M5X0.8	5.0	-	-	2.5	-	-	-	
		6X6	M6X1.0	6.0			3.0	-	-	-	
		6X14	M6X1.0	14.0	-	-	3.0	-	-	-	
		6X22	M6X1.0	22.0		-	3.0		-	-	
		10X10	M10X1.5	10.0	-	-	5.0	-	-	-	
	HSB	4X8R/L	M4X0.7	8.0	R2.0	-	2.0	-	-	-	R shows Right-hand Thread L shows Left-hand Thread
	LS	-03	M5X0.8	10.0	M5X0.8	-	2.0	-	-	-	
		-03S	M5X0.8	12.2	M5X0.8	-	2.5	-	-	-	
	LS	-05	M5X0.8	15.5	M5X0.8	-	2.0	2.0	-	-	
	LS	-1	M6X1.0	17.0	6.0	-	2.5	2.5	-	-	
		-1S	M6X1.0	14.2	6.0	-	2.5	2.5	-	-	
		-1T	M6X1.0	21.0	6.0	-	2.5	2.5	-	-	
		-2	M8X1.0	20.0	8.0	-	3.0	3.0	-	-	
		-3	M8X1.0	22.0	8.0	-	3.0	3.0	-	-	
		-4	M8X1.0	24.0	8.0	-	3.0	3.0	-	-	
		-5	M10X1.0	29.0	10.0	-	4.0	4.0	-	-	
	LS	-11	M6X1.0	9.5	-	-	3.0	-	-	-	
		-15	M6X1.0	12.5	-	-	3.0	-	-	-	

Screw

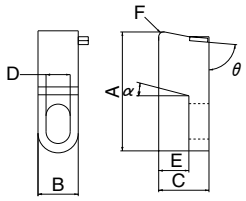
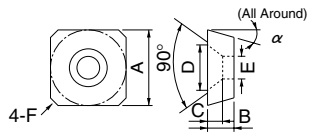
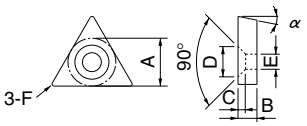
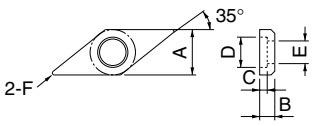
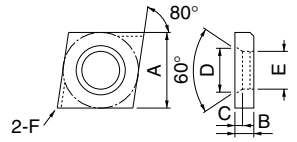
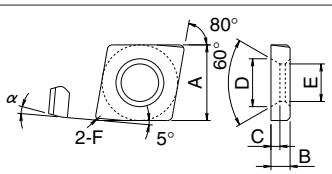
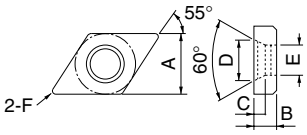
Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	M	3X8	M3X0.5	8.0	5.5	2.0	-	-	-	-	Equivalent to JIS B1101
		3X12	M3X0.5	12.0	5.5	2.0	-	-	-	-	
		4X10	M4X0.7	10.0	7.0	2.6	-	-	-	-	
	SB	-1TR	M2X0.4	5.3	3.8	-	-	T6	-	82°	R shows Right-hand Thread L shows Left-hand Thread
		-2TR	M2.5X0.45	6.2	4.5	-	-	T8	-	82°	
		-3TR/L	M3X0.5	7.2	4.8	-	-	T10	-	82°	
		-3STR	M3X0.5	6.4	5.2	-	-	T10	-	82°	
		-3.5TR	M3.5X0.6	9.3	5.6	-	-	T15	-	82°	
		-4TR	M4X0.7	7.7	5.8	-	-	T15	-	82°	
		-5TR	M5X0.8	20.0	8.7	-	-	T20	-	90°	
		-2080TR	M2X0.4	8.4	2.8	-	-	T6	-	60°	
		-2290TR	M2.2X0.45	9.2	2.8	-	-	T6	-	60°	
		-25100TR	M2.5X0.45	10.0	3.5	-	-	T7	-	60°	
		-40115TR	M4X0.7	11.5	5.5	-	-	T15	-	60°	
		-50120TR	M5X0.8	12.0	6.8	-	-	T20	-	60°	
		-5070TR	M5X0.8	7.0	6.8	-	-	T20	-	60°	
		-5090TR	M5X0.8	9.0	6.8	-	-	T20	-	60°	
	SB	-1STR	M2X0.4	5.0	3.1	-	-	T6	-	60°	R shows Right-hand Thread L shows Left-hand Thread
		-1630TR	M1.6X0.35	3.3	2.6	-	-	T6	-	60°	
		-2040TR	M2X0.4	3.8	3.0	-	-	T6	-	60°	
		-2040TRG	M2X0.4	4.0	3.0	-	-	T6	-	60°	
		-2045TR	M2X0.4	4.3	2.7	-	-	T6	-	60°	
		-2050TR	M2X0.4	4.8	3.0	-	-	T6	-	60°	
		-2060TR	M2X0.4	5.8	3.5	-	-	T8	-	60°	
		-2260TR	M2.2X0.45	5.8	3.1	-	-	T7	-	60°	
		-2545TR	M2.5X0.45	4.6	3.5	-	-	T8	-	60°	
		-2555TRG	M2.5X0.45	5.4	3.5	-	-	T8	-	60°	
		-2560TR	M2.5X0.45	5.7	3.5	-	-	T8	-	60°	
		-2570TR	M2.5X0.45	6.8	3.5	-	-	T8	-	60°	
		-3060TR	M3X0.5	5.3	4.2	-	-	T10	-	60°	
		-3060TRG	M3X0.5	5.9	4.2	-	-	T10	-	60°	
		-3070TRG	M3X0.5	7.0	4.2	-	-	T10	-	60°	
		-3080TR	M3X0.5	8.0	4.2	-	-	T10	-	60°	
		-4065TR	M4X0.7	6.7	5.5	-	-	T15	-	60°	
		-4070TRG	M4X0.7	7.0	5.5	-	-	T15	-	60°	
		-4085TR	M4X0.7	8.5	5.5	-	-	T15	-	60°	
		-40140TR	M4X0.7	14.0	5.5	-	-	T15	-	60°	
		-5085TR	M5X0.8	8.5	6.8	-	-	T20	-	50°	
		-60120TR	M6X1.0	12.0	8.5	-	-	T25	-	60°	
	SB	-4070TRW	M4X0.7	6.7	5.5	-	-	T8	-	60°	R shows Right-hand Thread L shows Left-hand Thread
	SC	-30067	M3X0.35	6.7	4.4	-	-	T8	-	60°	
		-35085	M3.5X0.35	8.5	5.7	-	-	T10	-	60°	
		-40100	M4X0.5	10.0	6.0	-	-	T15	-	60°	
		-50130	M5X0.5	13.0	6.6	-	-	T20	-	40°	
		-60160	M6X0.75	16.0	8.0	-	-	T25	-	40°	
		-60210	M6X0.75	21.0	9.6	-	-	T30	-	40°	
	SE	-40120TR	M4X0.7	12.0	5.1	-	-	T15	-	43°	R shows Right-hand Thread L shows Left-hand Thread
		-50125TR	M5X0.8	12.5	6.4	-	-	T20	-	43°	

Spare Parts

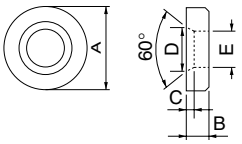
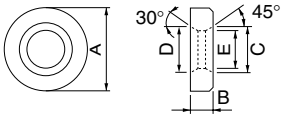
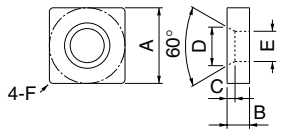
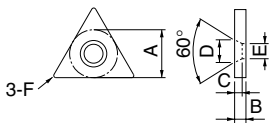
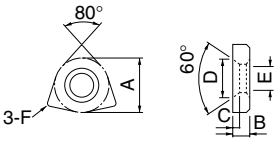
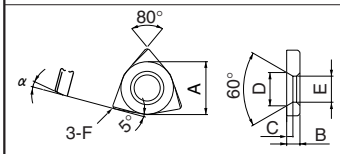
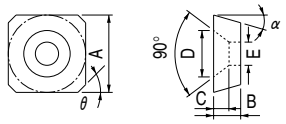
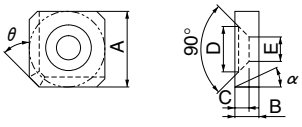
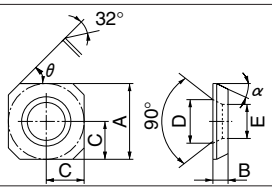
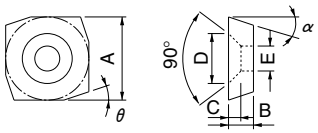
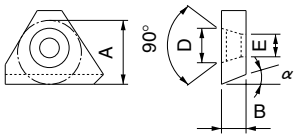
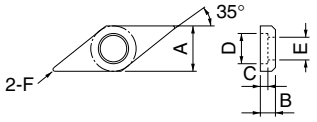
Screw

Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	SP	3X6	M3X0.5	6.0	6.0	-	-	-	-	90°	Equivalent to JIS B1111
		3X8	M3X0.5	8.0	6.0	-	-	-	-	90°	
		3X10	M3X0.5	10.0	6.0	-	-	-	-	90°	
	TH	8X15	M8X1.25	20.0	8.5	-	4.0	-	-	-	
	W	8X18	M8X1.25	18.0	-	-	4.0	-	-	-	

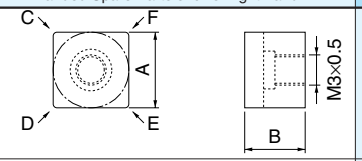
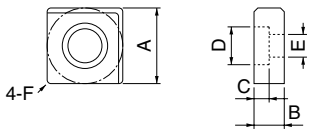
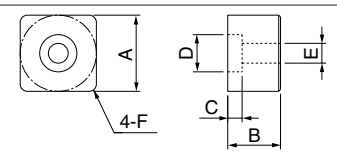
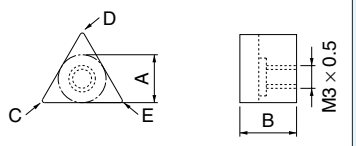
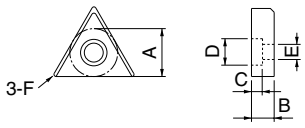
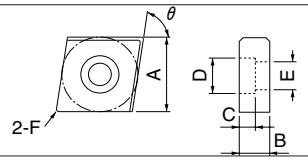
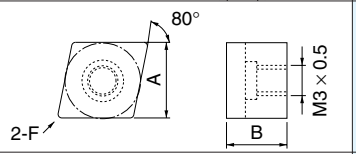
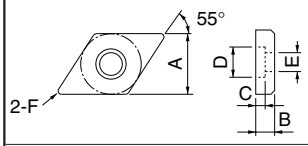
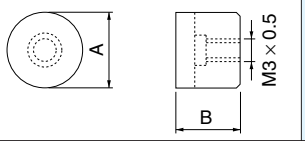
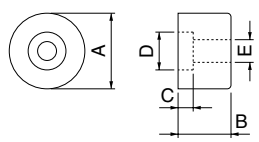
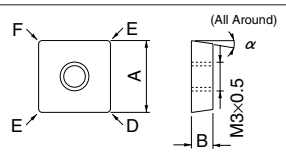
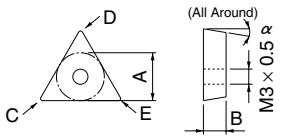
Shim

Shape Handed Spare Parts shows Right-hand	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	346	CR/L	30.5	10.0	12.7	5.6	7.5	1.6	15°	75°	R shows Right-hand L shows Left-hand
	556	CR/L	34.0	10.0	12.7	5.6	7.5	1.6	0°	55°	Shim Screw : HH5X16
	KPS	-42	11.5	3.2	2.0	7.2	3.2	C1.0	7°	-	Shim Screw : SP3X8 : SP3X10
	KPT	-32	8.0	3.2	1.9	7.0	3.2	R0.4	11°	-	Shim Screw : SP3X8 : SP3X10
		-42	10.5	3.18	1.9	7.0	3.2	R0.8	11°	-	
	KVN	-32	9.525	3.175	2.1	7.6	5.5	R0.8	-	-	Lock Pin : LP-2S : LP-6S
	LC	-32	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim Pin : LSP-1
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin : LSP-2
		-53	15.9	4.8	1.7	10.0	8.0	R1.2	-	-	Shim Pin : LSP-3
		-63	19.0	4.8	2.0	11.61	9.3	R1.6	-	-	Shim Pin : LSP-4
	LC	-42R/L	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R shows Right-hand L shows Left-hand Shim Pin : LSP-2
	LD	-32	9.47	2.4	1.3	6.18	4.68	R0.4	-	-	Shim Pin : LSP-1
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin : LSP-2
		-43	12.65	4.8	3.1	8.5	6.28	R0.8	-	-	Shim Pin : LSP-2

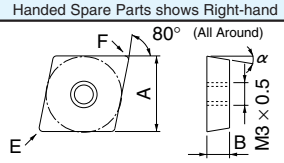
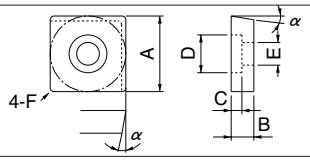
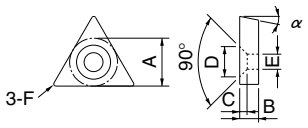
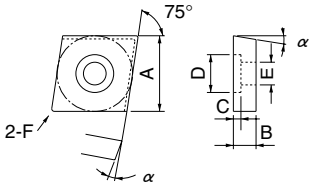
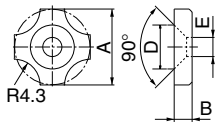
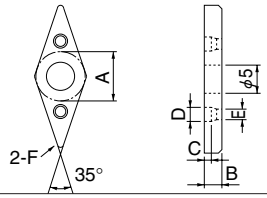
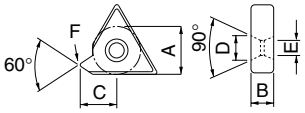
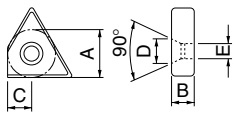
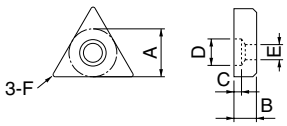
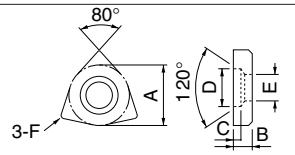
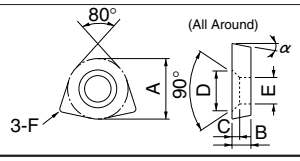
Shim

Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	LR -80	9.47	3.2	1.3	6.25	4.75	-	-	-	Shim Pin : LSP-1 Shim Screw : SP3X8
	LR -81	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim Pin : LSP-2
	LR -10C	8.5	3.18	6.3	6.3	4.7	-	-	-	Shim Pin : LSP-1
	LR -12C	10.0	3.18	6.3	6.3	4.7	-	-	-	
	LR -16C	16.0	3.18	7.9	8.01	6.28	-	-	-	Shim Pin : LSP-2
	LS -32	9.47	3.2	1.3	6.18	4.68	R0.8	-	-	Shim Pin : LSP-1
	LS -42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin : LSP-2
	LT -32	9.47	2.7	1.3	6.18	4.68	R0.8	-	-	Shim Pin : LSP-1
	LT -42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin : LSP-2
	LW -32	9.5	2.4	1.3	6.18	4.68	R0.8	-	-	Shim Pin : LSP-1
	LW -42	12.7	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin : LSP-2
	LW -42R/L	12.7	3.2	1.5	8.01	6.28	R0.8	10°	-	R shows Right-hand L shows Left-hand Shim Pin : LSP-2
	MSD -42	10.7	3.18	1.85	7.0	3.3	-	20°	45°	Shim Screw : SP3X8
	MSE -4215	10.5	3.18	1.5	6.4	3.4	-	25°	15°	Shim Screw : SP3X8
	MSE -4245	10.5	3.18	1.5	6.4	3.4	-	25°	45°	
	MSO -4T245	10.0	2.0	4.7	6.4	4.8	-	27°	45°	Shim Screw : SP3X6
	MSP -42	11.3	3.18	1.85	7.0	3.3	-	11°	15°	Shim Screw : SP3X8
	MTE -42	9.8	3.18	-	6.4	3.4	-	25°	-	Shim Screw : SP3X8
	MVN -32	9.5	3.2	2.1	7.4	6.5	R0.8	-	-	Lock Pin : TS-3S

Shim

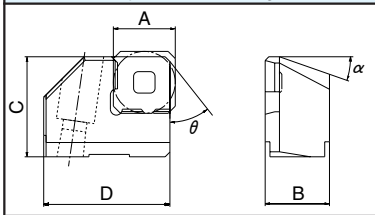
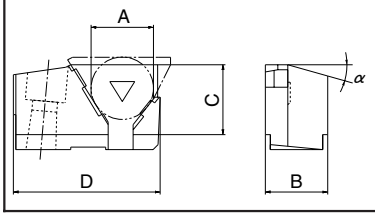
Shape (Handed Spare Parts shows Right-hand)	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	SP -129	9.5	9.52	R0.8	R1.6	R1.2	R1.6	-	-	Shim Screw : HH3X12
	SP -141	12.7	4.0	2.4	6.2	3.3	R1.2	-	-	Shim Screw : M3X8
	-143	12.7	7.2	2.4	6.2	3.3	R1.2	-	-	Shim Screw : M3X12
	-162	15.8	6.0	3.4	8.0	4.4	R1.5	-	-	Shim Screw : M4X10
	SP -148	12.7	8.8	2.4	6.2	3.3	R1.2	-	-	Shim Screw : BH3X12
	SP -219	6.35	9.52	R0.8	R1.2	R1.6	-	-	-	Shim Screw : HH3X12
	SP -221	9.52	4.0	2.5	6.5	3.5	R1.2	-	-	Shim Screw : M3X8
	-223	9.52	7.2	2.5	6.5	3.5	R1.2	-	-	Shim Screw : M3X12
	SP -342	12.7	6.0	2.5	6.5	3.5	R1.2	-	75°	Shim Screw : M3X8
	-441	12.7	4.0	2.5	6.5	3.5	R0.8	-	80°	Shim Screw : M3X8
	-443	12.7	7.2	2.5	6.5	3.5	R0.8	-	80°	Shim Screw : M3X12
	-454	15.7	8.0	3.4	8.0	4.5	R1.6	-	80°	Shim Screw : M4X10
	SP -429	9.52	9.52	-	-	-	R1.2	-	-	Shim Screw : HH3X12
	SP -521	10.0	4.0	2.5	6.0	3.4	R1.0	-	-	Shim Screw : M3X8
	SP -826	9.52	7.9	-	-	-	-	-	-	Shim Screw : HH3X12
	-829	9.52	9.52	-	-	-	-	-	-	
	SP -841	12.7	4.0	2.4	6.2	3.3	-	-	-	Shim Screw : M3X8
	-843	12.7	7.2	2.4	6.2	3.3	-	-	-	Shim Screw : M3X12
	-849	12.7	8.8	2.4	6.2	3.3	-	-	-	Shim Screw : BH3X12
	-861	15.8	6.0	3.4	8.0	4.4	-	-	-	Shim Screw : M4X10
	SP -130A	9.525	3.2	-	R0.4	R0.8	R1.2	8°	-	Shim Screw : BH3X12
	SP -210A	6.35	3.2	R0.4	R0.8	R1.2	-	8°	-	Shim Screw : BH3X6

Shim

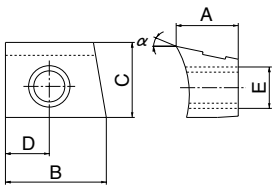
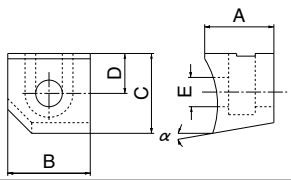
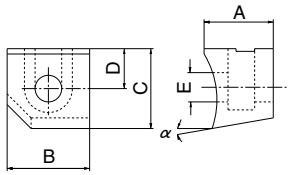
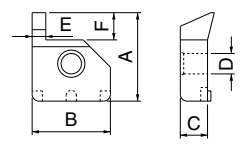
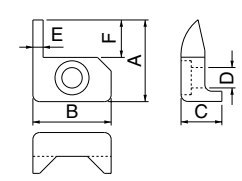
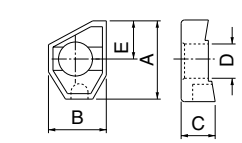
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**SP -420A**	9.525	3.22	-	-	R0.8	R1.2	8°	-	Shim Screw : BH3X6
	**SP -141P**	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw : M3X8
	-143P	12.7	7.2	2.4	6.2	3.3	R1.2	7°	-	Shim Screw : M3X12
	**SP -230P**	8.3	3.2	2.0	7.2	3.2	R0.5	7°	-	Shim Screw : SP3X10
	**SP -341P**	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw : M3X8
	**SP -RC**	12.6	3.0	-	7.35	3.35	-	-	-	Shim Screw : SP3X8
	**SVN -32**	8.0	3.18	1.5	3.1	2.3	R0.4	-	-	Shim Screw : SB-2050TR
	**TN -32**	9.52	3.2	6.5	7.0	4.2	R0.4	-	-	Shim Screw : SP3X8
	-43	12.70	3.2	8.1	7.0	4.2	R0.5	-	-	
	**TNW -32**	9.52	3.2	4.8	7.0	4.2	-	-	-	Shim Screw : SP3X8
	**WTN -33**	9.52	4.76	2.5	7.0	5.3	R0.8	-	-	Shim Pin : WP-1S
	**WWN -42**	12.7	3.0	1.4	7.0	5.3	R1.2	-	-	Shim Pin : WP5X15
	**WWP -42**	12.7	3.0	1.5	8.3	5.3	R1.2	11°	-	Shim Pin : WP5X11

Spare Parts

Locator

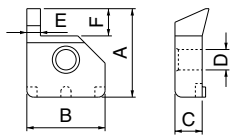
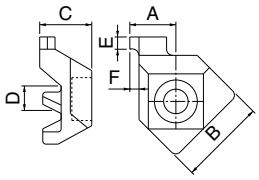
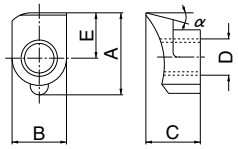
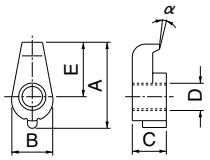
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**LSD -445R**	12.7	13.0	20.0	26.5	-	-	20°	45°	Dimension A Shows I.D. of Insert
	LSE -445R	12.7	11.5	15.5	23.5	-	-	20°	45°	
	LSO -445R	13.494	12.0	21.3	23.5	-	-	27°	45°	
	LSP -415R	12.7	13.0	18.0	26.0	-	-	15°	15°	
	**LTE -490R**	12.7	12.0	17.0	30.0	-	-	15°	-	Dimension A Shows I.D. of Insert

Clamp

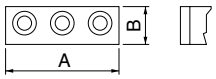
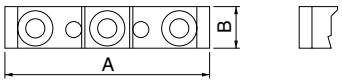
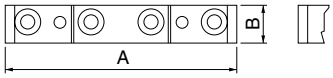
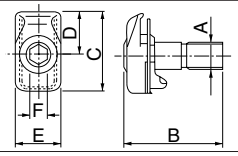
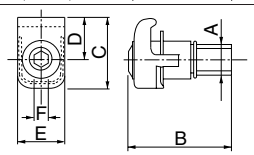
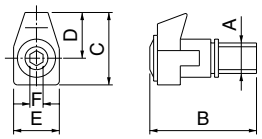
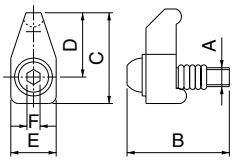
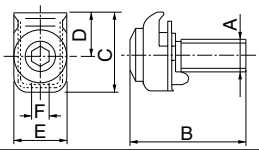
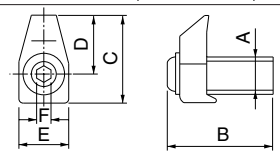
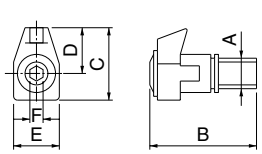
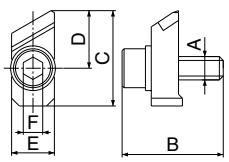
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**C 17R**	12.2	19.5	14.3	8.5	M8X1.25 (L-hand Thread)	-	12°	-	Lock Screw : W8X18
	**C 20R**	15.1	15.5	15.0	7.5	5.3	-	10°	-	Lock Screw : TH8X15
	CH -20R	13.1	15.5	14.8	7.5	5.3	-	10°	-	
	**C 25R**	13.2	15.5	15.0	7.5	5.3	-	10°	-	Lock Screw : TH8X15
	**CE -111**	35.0	25.0	10.0	8.0	3.0	10.0	-	-	Right-hand
	-121	35.0	25.0	10.0	8.0	3.0	10.0	-	-	Left-hand
	-131	35.0	25.0	10.0	8.0	4.5	10.0	-	-	Right-hand
	-141	35.0	25.0	10.0	8.0	4.5	10.0	-	-	Left-hand
	**CGA -3R/L**	24.0	17.66	12.0	6.2	1.9	11.0	-	-	R shows Right-hand L shows Left-hand
	-4R/L	24.0	17.66	12.0	6.2	2.9	11.0	-	-	
	-5R/L	27.5	18.66	12.0	6.2	3.9	14.5	-	-	
	**CGB R/L**	19.0	14.0	8.2	6.35	9.5	-	-	-	R shows Right-hand L shows Left-hand

Spare Parts

Clamp

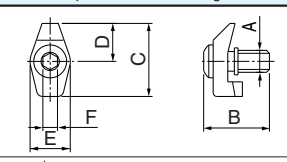
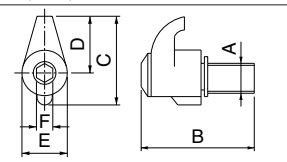
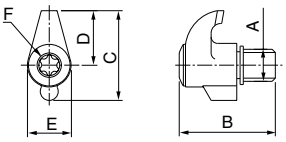
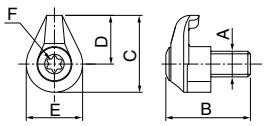
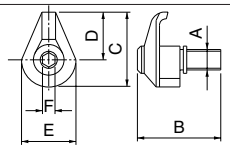
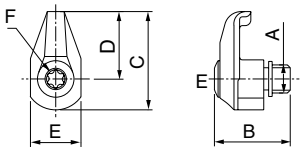
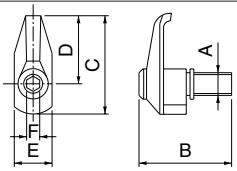
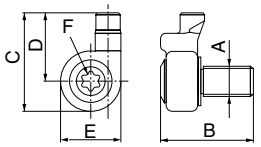
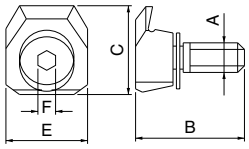
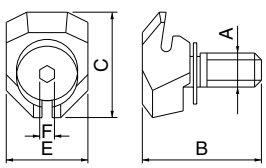
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**CGH -1R/L**	25.0	22.0	8.0	6.05	3.0	5.5	-	-	R shows Right-hand L shows Left-hand
	-2R/L	25.0	22.0	8.0	6.05	5.0	5.5	-	-	
	-3R/L	29.0	23.0	8.5	6.05	6.0	6.0	-	-	
	**CGIA -3R**	10.7	17.0	10.5	5.2	1.8	20.0	-	-	
	-4R	10.7	17.0	10.5	5.2	2.5	20.0	-	-	
	-5R	15.7	17.0	10.5	5.2	3.5	7.0	-	-	
	**CP -8TE**	17.9	12.0	12.0	M8X1.25 (L-hand Thread)	10.0	-	15°	-	
	**CP -8W**	20.9	12.0	8.0	M8X1.25 (L-hand Thread)	13.0	-	3°	-	

Clamp Set

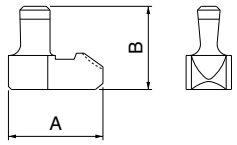
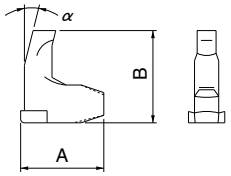
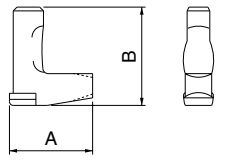
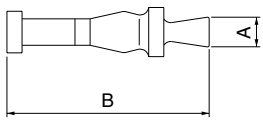
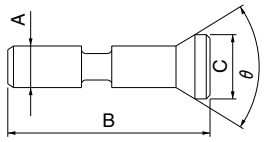
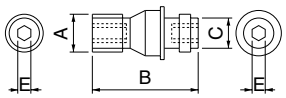
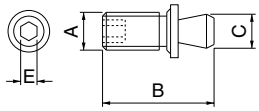
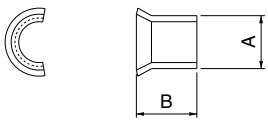
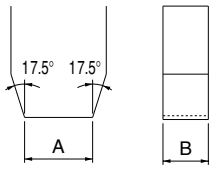
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	BCS -1	64.0	13.0	-	-	-	-	-	-	
	-5	48.0	16.5	-	-	-	-	-	-	
	BCS -2	74.0	15.0	-	-	-	-	-	-	
	-3	88.0	16.0	-	-	-	-	-	-	
	BCS -4	98.0	16.0	-	-	-	-	-	-	
	CE -010	M8X1.25	28.0	24.0	6.5	13.0	4.0	-	-	
	-220	M8X1.25	28.0	27.0	15.8	15.0	4.0	-	-	
	CE -020	M8X1.25	30.0	17.0	10.5	12.7	4.0	-	-	
	CE -030	M8X1.25	30.0	19.0	12.5	12.7	4.0	-	-	
	-040	M8X1.25	30.0	22.5	16.0	12.7	4.0	-	-	
	CE -050	M6X1.0	20.0	25.5	17.0	12.5	4.0	-	-	
	CE -320	M6X1.0	20.0	18.2	9.7	12.7	4.0	-	-	
	CE -360S	M6X1.0	16.0	18.0	10.6	12.4	4.0	-	-	
	CE -030A	M8X1.25	30.0	20.2	13.7	12.7	4.0	-	-	
	CP -RC[R/L]	M6X1.0	20.0	24.5	14.8	11.0	5.0	-	-	R shows Right-hand L shows Left-hand

Spare Parts

Clamp Set

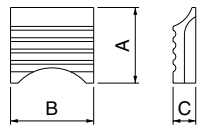
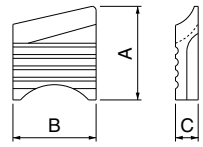
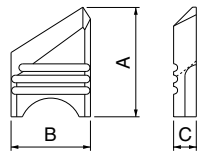
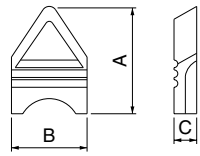
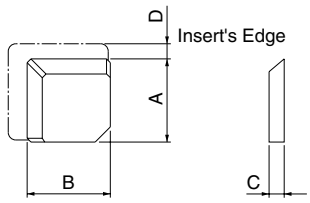
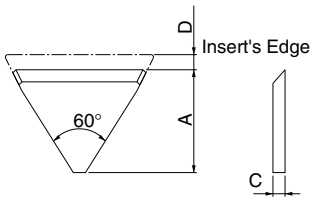
Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**CPS -1**	M3X0.5	9.0	10.0	5.2	5.5	2.0	-	-	
	**CPS -2**	M5X0.8	14.5	14.0	8.5	6.8	2.5	-	-	
	-2P	M5X0.8	18.0	14.0	8.5	6.8	2.5	-	-	
	-3	M6X1.0	19.0	16.5	10.0	8.8	3.0	-	-	
	**CPS -2S**	M5X0.8	13.5	14.0	8.5	6.8	T15	-	-	
	-2TR	M5X0.8	15.0	14.0	8.5	6.8	T15	-	-	
	**CPS -4V**	M4X0.7	8.9	11.3	7.3	8.0	T10	-	-	
	-5F	M5X0.8	11.3	12.7	7.5	10.3	T15	-	-	
	-5S	M5X0.8	18.0	15.0	9.5	11.0	T15	-	-	
	-5V	M5X0.8	13.5	12.7	7.5	10.3	T15	-	-	
	**CPS -6F**	M6X1.0	16.5	15.6	9.5	12.2	3.0	-	-	
	-6M	M6X1.0	18.5	17.5	11.0	13.0	3.0	-	-	
	-6S	M6X1.0	18.5	18.0	12.0	12.0	3.0	-	-	
	-6V	M6X1.0	18.5	15.6	9.5	12.2	3.0	-	-	
	-8V	M8X1.25	24.0	20.8	13.0	15.5	4.0	-	-	
	**CPS -5E**	M5X0.8	13.5	17.5	12.0	9.0	T15	-	-	
	**CPS -5R/L**	M5X0.8	18.0	17.5	12.0	9.0	2.5	-	-	R shows Right-hand Thread L shows Left-hand
	**LGBA -16R/L S**	M5X0.8	15.0	16.1	11.2	9.85	T15	-	-	R shows Right-hand L shows Left-hand
	-22R/L S	M5X0.8	15.0	17.6	12.7	9.85	T15	-	-	
	**WCS -1N**	M6X1.0	21.0	16.7	-	15.0	3.0	-	-	
	**WCS -8**	M6X1.0	21.0	19.4	-	15.0	3.0	-	-	

Pin

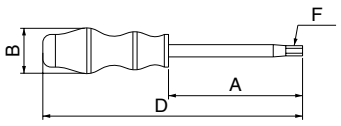
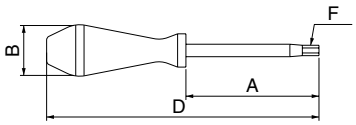
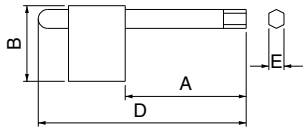
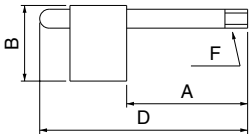
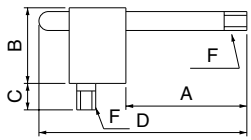
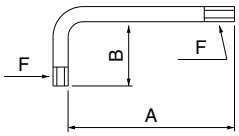
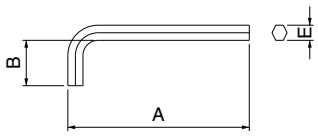
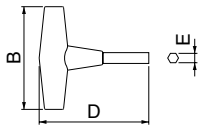
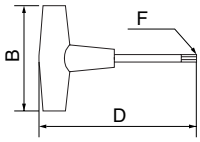
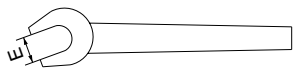
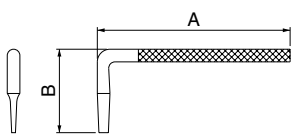
Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	LL	-03	7.8	6.3	-	-	-	-	-	-	
		-03S	11.1	8.9	-	-	-	-	-	-	
		-03T	8.3	8.9	-	-	-	-	-	-	
	LL	-05C	10.7	11.7	-	-	-	-	12°	-	
		-1C	13.0	13.3	-	-	-	-	14°	-	
		-2C	18.8	17.6	-	-	-	-	14°	-	
	LL	-1	10.3	12.0	-	-	-	-	-	-	
		-1D	12.3	12.0	-	-	-	-	-	-	
		-2	13.5	13.0	-	-	-	-	-	-	
		-3	16.4	13.0	-	-	-	-	-	-	
		-4	16.4	14.7	-	-	-	-	-	-	
		-5	17.1	16.7	-	-	-	-	-	-	
		-6	20.7	21.0	-	-	-	-	-	-	
	LP	-2S	3.65	20.0	-	-	-	-	-	-	
		-6S	3.65	25.0	-	-	-	-	-	-	
	LPA	-11	2.8	11.0	4.2	-	-	-	-	60°	
		-13	2.8	13.0	4.2	-	-	-	-	60°	
		-17	2.8	17.0	4.2	-	-	-	-	60°	
	LPF	-11	2.5	11.0	3.5	-	-	-	-	60°	
		-13	3.8	13.0	5.5	-	-	-	-	60°	
		-17	3.8	17.0	5.5	-	-	-	-	60°	
		-1113	2.5	13.0	3.5	-	-	-	-	60°	
		-1117	2.5	17.0	3.5	-	-	-	-	60°	
	TS	-3S	M5X0.8	15.0	3.60	-	2.0	-	-	-	
	WP	-1S	M5X0.8	17.5	3.65	-	2.0	-	-	-	
		5X11	M5X0.8	10.5	5.0	-	2.0	-	-	-	
		5X15	M5X0.8	15.0	5.0	-	2.0	-	-	-	
	LSP	-1	5.0	5.3	-	-	-	-	-	-	
		-2	6.5	5.6	-	-	-	-	-	-	
		-3	8.25	7.9	-	-	-	-	-	-	
		-4	9.5	10.0	-	-	-	-	-	-	
	P	-03	2.8	1.95	-	-	-	-	-	-	
		-03S	3.5	1.95	-	-	-	-	-	-	

Spare Parts

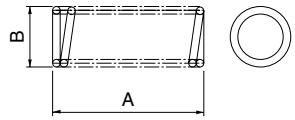
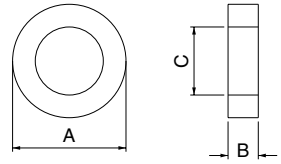
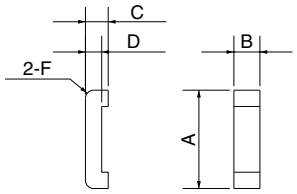
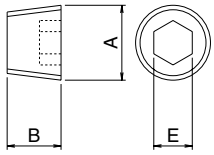
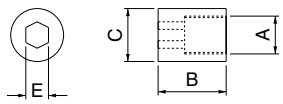
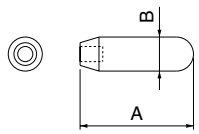
Chipbreaker

Shape Handed Spare Parts shows Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	**CB -11**	11.5	12.7	3.5	-	-	-	-	-	
	-51	16.0	15.6	3.5	-	-	-	-	-	
	**CB -12**	13.8	12.7	3.5	-	-	-	-	-	Right-hand
	-13	13.8	12.7	3.5	-	-	-	-	-	Left-hand
	**CB -14**	18.51	12.7	3.5	-	-	-	-	-	Right-hand
	-15	18.51	12.7	3.5	-	-	-	-	-	Left-hand
	**CB -16**	18.0	12.7	3.5	-	-	-	-	-	
	-17	21.0	15.6	3.5	-	-	-	-	-	
	**CB -S3220**	7.94	7.94	1.0	2.0	-	-	-	-	
	-S4220	11.12	11.12	2.0	2.0	-	-	-	-	
	**CB -T2212**	7.48	-	1.5	1.2	-	-	-	-	
	-T3220	10.87	-	2.0	2.0	-	-	-	-	

Wrench/Spanner

Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	DT	-7	44.0	14.8	-	114.0	-	T7	-	-	Trox
		-8	70.0	25.5	-	150.0	-	T8	-	-	
	DT	-10	70.0	28.5	-	160.0	-	T10	-	-	Trox
		-15	70.0	31.5	-	170.0	-	T15	-	-	
		-20	90.0	31.5	-	190.0	-	T20	-	-	
		-25	82.0	35.5	-	190.0	-	T25	-	-	
	FH	-2	42.0	20.0	-	73.0	2.0	-	-	-	Hexagon
		-2.5	42.0	20.0	-	73.0	2.5	-	-	-	
	FT	-6	30.0	20.0	-	65.0	-	T6	-	-	Trox
		-8	35.0	20.0	-	74.0	-	T8	-	-	
		-10	40.0	20.0	-	74.0	-	T10	-	-	
	FT	-15	43.0	25.0	10.0	80.0	-	T15	-	-	Trox
	LTW	-10S	65.0	10.0	-	-	-	T10	-	-	Trox
		-15S	65.0	10.0	-	-	-	T15	-	-	
		-20	57.0	20.0	-	-	-	T20	-	-	
	LW	-1.5	45.0	14.0	-	-	1.5	-	-	-	Hexagon
		-2	50.0	16.0	-	-	2.0	-	-	-	
		-2.5	56.0	18.0	-	-	2.5	-	-	-	
		-3	63.0	20.0	-	-	3.0	-	-	-	
		-4	70.0	25.0	-	-	4.0	-	-	-	
		-5	80.0	28.0	-	-	5.0	-	-	-	
		-6	90.0	32.0	-	-	6.0	-	-	-	
		-10	112.0	40.0	-	-	10.0	-	-	-	
		-14	140.0	56.0	-	-	14.0	-	-	-	
		-17	160.0	63.0	-	-	17.0	-	-	-	
		-19	180.0	70.0	-	-	19.0	-	-	-	
	TH	-4	-	80.0	-	83.0	4.0	-	-	-	Hexagon
	TT	-25	-	70.0	-	70.0	-	T25	-	-	Trox
		-30	-	80.0	-	110.0	-	T30	-	-	
	S	-7	-	-	-	-	7.0	-	-	-	Hexagon
	LTK	-5	70.0	30.0	-	-	-	-	-	-	

Spring/Washer/Plug/Nut/Punch

Shape	Description		Dimension (mm)						Angle (°)		Remarks
			A	B	C	D	E	F	α	θ	
	**SP**	**-5**	12.0	6.7	-	-	-	-	-	-	
		-6	12.0	7.7	-	-	-	-	-	-	
		-8	11.0	9.7	-	-	-	-	-	-	
	**W**	**-6**	11.5	1.6	6.4	-	-	-	-	-	
		-8	15.5	1.6	8.4	-	-	-	-	-	
	W	**6-14**	11.5	1.4	6.4	-	-	-	-	-	
	WB	**-5**	10.0	1.0	5.3	-	-	-	-	-	
		-6	11.5	1.6	6.4	-	-	-	-	-	Brass
		-8	15.5	1.6	8.4	-	-	-	-	-	
	**WSP**	**-1**	15.1	4.0	3.5	2.5	-	R1.25	-	-	
	**GP**	**-1**	PT1/8	7.0	-	-	5.0	-	-	-	
		-2	PT1/4	9.0	-	-	6.0	-	-	-	
	**WN**	**-1**	M5X0.8	10.0	7.0	-	3.0	-	-	-	
	**PC**	**-1**	60.0	8.5	-	-	-	-	-	-	
		-2	65.0	10.0	-	-	-	-	-	-	

Technical Information

487～508

SI Derived Units Conversion Chart

SI Derived Units Conversion Chart

(Bold lined units are the ones by SI Unit.)

(Extracted from JIS Handbook "Iron & Steel")

Force

N	kgf	dyn
1	$1.019\ 72\times10^{-1}$	1×10^{5}
9.806 65	1	$9.806\ 65\times10^{5}$
1×10^{-5}	$1.019\ 72\times10^{-6}$	1

Stress

1Pa=1N/m^2,1MPa=1N/mm^2

Pa or **N/m^2**	**MPa** or **N/mm^2**	kgf/mm^2	kgf/cm^2	kgf/m^2
1	1×10^{-6}	$1.019\ 72\times10^{-7}$	$1.019\ 72\times10^{-5}$	$1.019\ 72\times10^{-1}$
1×10^{6}	1	$1.019\ 72\times10^{-1}$	$1.019\ 72\times10$	$1.019\ 72\times10^{5}$
$9.806\ 65\times10^{6}$	9.806 65	1	1×10^{2}	1×10^{6}
$9.806\ 65\times10^{4}$	$9.806\ 65\times10^{-2}$	1×10^{-2}	1	1×10^{4}
9.806 65	$9.806\ 65\times10^{-6}$	1×10^{-6}	1×10^{-4}	1

Pressure

1Pa=1N/m^2

Pa	**kPa**	**Mpa**	bar	kgf/cm^2
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	$1.019\ 72\times10^{-5}$
1×10^{3}	1	1×10^{-3}	1×10^{-2}	$1.019\ 72\times10^{-2}$
1×10^{6}	1×10^{3}	1	1×10	$1.019\ 72\times10$
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.019 72
$9.806\ 65\times10^{4}$	$9.806\ 65\times10$	$9.806\ 65\times10^{-2}$	$9.806\ 65\times10^{-1}$	1

Work / Energy / Calorie

1J=1W·s, 1J=1N·m

J	kW·h	kgf·m	kcal
1	$2.777\ 78\times10^{-7}$	$1.019\ 72\times10^{-1}$	$2.388\ 89\times10^{-4}$
$3.600\ 00\times10^{6}$	1	$3.670\ 98\times10^{5}$	$8.600\ 00\times10^{2}$
9.806 65	$2.724\ 07\times10^{-6}$	1	$2.342\ 70\times10^{-3}$
$4.186\ 05\times10^{3}$	$1.162\ 79\times10^{-3}$	$4.268\ 58\times10^{2}$	1

Power

1W=1J/s , PS: Horsepower

W	**kW**	kgf·m/s	PS	kcal/h
1	1×10^{-3}	$1.019\ 72\times10^{-1}$	$1.359\ 62\times10^{-3}$	$8.600\ 00\times10^{-1}$
1×10^{3}	1	$1.019\ 72\times10^{2}$	1.359 62	$8.600\ 00\times10^{2}$
9.806 65	$9.806\ 65\times10^{-3}$	1	$1.333\ 33\times10^{-2}$	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	$6.325\ 29\times10^{2}$
1.162 79	$1.162\ 79\times10^{-3}$	$1.185\ 72\times10^{-1}$	$1.580\ 95\times10^{-3}$	1

Specific Heat

J/ (kg·K)	kcal/ (kg·°C) cal/ (g·°C)
1	$2.388\ 89\times10^{-4}$
$4.186\ 05\times10^{3}$	1

Thermal Conductivity

W/ (m·K)	kcal/ (h·m·°C)
1	$8.600\ 00\times10^{-1}$
1.162 79	1

Revolution

min^{-1}	**s^{-1}**	r.p.m.
1	0.0167	1
60	1	60

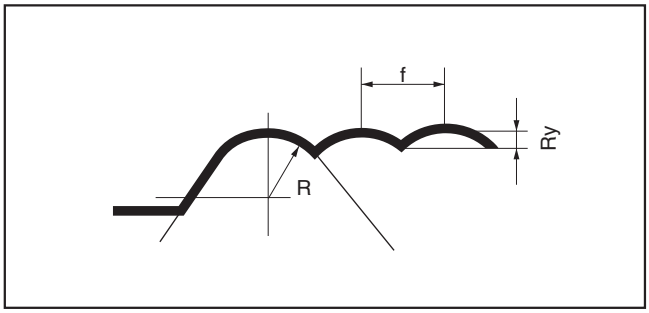
Surface Roughness

Theoretical (Geometrical) Surface Roughness

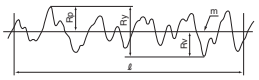
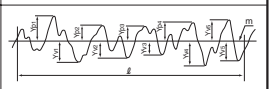
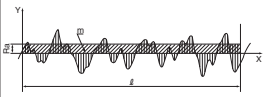
Theoretical Surface Roughness at Turning means the minimum roughness value from the cutting conditions and it is shown by the formula as follows:

$$Ry=\frac{f^2}{8R}\times 10^3$$

Ry : Theoretical Surface Roughness [μm]
f : Feed Rate [mm/rev]
R : Corner Radius of Insert [mm]



How to obtain various Surface Roughness Value

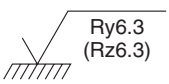
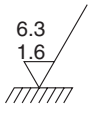
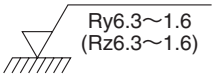
Type	Symbol	How to Obtain	Explanation
Max. Height Roughness	Ry	Ry is obtained from the distance in micron meter between the highest peak and the lowest valley in the range of sampled reference length (ℓ) to the direction of mean line of the roughness curve $Ry=Rp+Rv$	
Ten Points Mean Roughness	Rz	Rz is obtained from the total in micron meter of the mean value of the each distance between the mean line and 5 peaks (Yp) from the highest one, and the mean value of the each distance between the mean line and the 5 valleys (Yv) from the lowest one, of the roughness curve in the range of sampled reference length "ℓ". $Rz=\frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$	 $Yp1+Yp2+Yp3+Yp4+Yp5$: Distance from the mean line to highest 5 peaks in the range of sampled reference length "ℓ" $Yv1+Yv2+Yv3+Yv4+Yv5$: Distance from the mean line to the lowest 5 valleys in the range of sampled reference length "ℓ"
Arithmetical Mean Roughness	Ra	Ra is obtained from the following formula in micron meter when the roughness curve is expressed by y=f(x), taking X-axis to the mean line direction and Y-axis to the vertical magnification of the roughness curve in the range of sampled reference length "ℓ". $Ra=\frac{1}{\ell}\int_0^{\ell}\{f(x)\}dx$	

Relationship with Triangle Symbol

Arithmetical Mean Roughness Ra(μm)	Max. Height Roughness Ry(μm)	Ten Points Mean Roughness Rz(μm)	Note) (Triangle Mark)	How to Indicate
0.025 0.050 0.10 0.20	0.100 0.20 0.40 0.80	0.100 0.20 0.40 0.80	(▽▽▽▽)	Example ①When Ra is 1.6 μm ↓ 1.6 μmRa ②When Ry is 6.3 μm ↓ 6.3 μmRy ③When Rz is 6.3 μm ↓ 6.3 μmRz
0.40 0.80 1.60	1.60 3.2 6.3	1.60 3.2 6.3	(▽▽▽)	
3.2 6.3	12.5 25	12.5 25	(▽▽)	
12.5 25	50 100	50 100	(▽)	

Note: Finishing symbol (Triangle ▽ and wave ～) was abolished from JIS standard from 1994 Revision.

Indication in JIS Standard

Example of Ra Indication	Example of Ry, (Rz) Indication
①When indicating upper limit only (when upper limit is 6.3 μmRa) 	①When indicating upper limit only Indicate surface roughness following the parameter symbol. 
②When indicating both lower and upper limit (when upper limit is 6.3 μmRa, lower limit is 1.6 μmRa) 	②When indicating both lower and upper limit Indicate surface roughness as (upper limit～lower limit) following the parameter symbol. 

Note: The indication way of Ra and Ry/Rz is different each other.

Caution to Surface Roughness Symbol

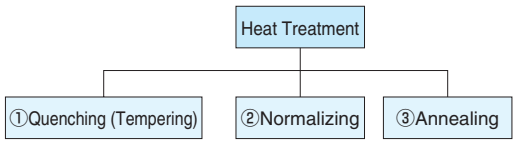
The above information is based on JIS B 0601-1994.
However, some symbols were revised as shown in the right table in accordance with ISO Standard from JIS B 0601-2001 version.
Ten Points Mean Roughness (Rz) was eliminated from 2001 version but it still remains as RzJIS reference, since it was popular in Japan.

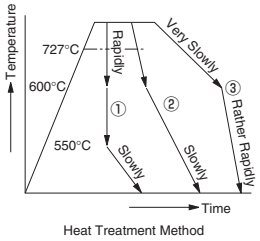
Type	Symbol of JIS B 0601-1994		Symbol of JIS B 0601-2001
Max. Height Roughness	Ry	→	Rz
Ten Points Mean Roughness	Rz	→	(RzJIS)
Arithmetical Mean Roughness	Ra	→	Ra

Heat Treatment and Hardness

■ Heat Treatment

One of the ways to determine the hardness of steel is the heat treatment and it is classified to 3 types as follows.



 Heat Treatment Method	① Quenching (Tempering)	After heating to over 727°C, cool rapidly down to 550°C in water or oil	It heightens the hardness and improves the wear resistance. Quenching makes steel hard because it cools down red-hot steel very rapidly in water or oil, but it contains internal stress. In order to remove such internal stress, tempering is used. (After cooled down once, reheat it to 200°C～700°C)
	② Normalizing	After heating to over 727°C, cool down rather rapidly to 600°C and then at normal temperature	It makes crystals minute. (Steel is also composed of something like small cell.) It is used to improve the mechanical character or machinability.
	③ Annealing	After heating to over 727°C, cool down very slowly to 600°C, then at normal temperature	It makes crystals minute too as the process of normalizing, but the crystal size is bigger than that of normalizing. It targets machinability improvement and distortion correction.

In case of chromium molybdenum steel or carbon steel, the heat treatment way may be called with specific symbol as follows.

Symbol	Heat Treatment Method	Description	Example
(R)	Raw	No treatment Material as it is rolled	SCM435 (R)
(H)	Quenching (Tempering)	Material after quenching or tempering	SCM435 (H)
(A)	Annealing	Material softened (Coarse Pearlite Organization)	SCM435 (A)
(N)	Normalizing	Material with minute Pearlite organization Harder and sticker than Annealed steel Chip control becomes worse a little	SCM435 (N)

"H" of JIS Standard (JIS G4052) such as SCM435H and SCr420H means "Structural Steels with Specified Hardenability Bands (H Steel)" and it is different from (H).

"Structural Steels with Specified Hardenability Bands (H Steel)" is the name of the steel material whose surface hardness' upper and lower limit is determined. Its surface hardness is measured after cooling down the material whose one end only is quenched by fountain water after heating to the quenching temperature, using round bar testpiece of 25mm-diameter and 100mm-length.

■ Hardness Value

Hardness	Reference Standard	Example	Explanation of Example
Brinell Hardness	JIS Z 2243 : 1992	250HB	Hardness Value: 250, Hardness Symbol: HB
		200～250HB	When the hardness has the range
Vickers Hardness	JIS Z 2244 : 1998	640HV	Hardness Value: 640, Hardness Symbol: HV
Rockwell Hardness	JIS Z 2245 : 1992	60HRC	Hardness Value: 60, Hardness Symbol: HRC
Shore Hardness	JIS Z 2246 : 1992	50HS	Hardness Value: 50, Hardness Symbol: HS

Conversion Chart for Scales of Vickers Hardness

Vickers Hardness	Brinell Hardness 10mm Dia. Ball Load: 3000kgf		Rockwell Hardness[2]			Shore Hardness	Tensile Strength Mpa[1]
	Standard Ball	Tungsten Carbide Ball	A Scale Load: 60kgf Diamond Point	B Scale Load: 100kgf 1.6mm Dia. Ball	C Scale Load 150kgf Diamond Point		
940	–	–	85.6	–	68.0	97	
920	–	–	85.3	–	67.5	96	
900	–	–	85.0	–	67.0	95	
880	–	(767)	84.7	–	66.4	93	
860	–	(757)	84.4	–	65.9	92	
840	–	(745)	84.1	–	65.3	91	
820	–	(733)	83.8	–	64.7	90	
800	–	(722)	83.4	–	64.0	88	
780	–	(710)	83.0	–	63.3	87	
760	–	(698)	82.6	–	62.5	86	
740	–	(684)	82.2	–	61.8	84	
720	–	(670)	81.8	–	61.0	83	
700	–	(656)	81.3	–	60.1	81	
690	–	(647)	81.1	–	59.7	–	
680	–	(638)	80.8	–	59.2	80	
670	–	630	80.6	–	58.8	–	
660	–	620	80.3	–	58.3	79	
650	–	611	80.0	–	57.8	–	
640	–	601	79.8	–	57.3	77	
630	–	591	79.5	–	56.8	–	
620	–	582	79.2	–	56.3	75	
610	–	573	78.9	–	55.7	–	
600	–	564	78.6	–	55.2	74	
590	–	554	78.4	–	54.7	–	2055
580	–	545	78.0	–	54.1	72	2020
570	–	535	77.8	–	53.6	–	1985
560	–	525	77.4	–	53.0	71	1950
550	505	517	77.0	–	52.3	–	1905
540	496	507	76.7	–	51.7	69	1860
530	488	497	76.4	–	51.1	–	1825
520	480	488	76.1	–	50.5	67	1795
510	473	479	75.7	–	49.8	–	1750
500	465	471	75.3	–	49.1	66	1705
490	456	460	74.9	–	48.4	–	1660
480	448	452	74.5	–	47.7	64	1620
470	441	442	74.1	–	46.9	–	1570
460	433	433	73.6	–	46.1	62	1530
450	425	425	73.3	–	45.3	–	1495
440	415	415	72.8	–	44.5	59	1460
430	405	405	72.3	–	43.6	–	1410
420	397	397	71.8	–	42.7	57	1370
410	388	388	71.4	–	41.8	–	1330
400	379	379	70.8	–	40.8	55	1290
390	369	369	70.3	–	39.8	–	1240
380	360	360	69.8	(110.0)	38.8	52	1205
370	350	350	69.2	–	37.7	–	1170
360	341	341	68.7	(109.0)	36.6	50	1130
350	331	331	68.1	–	35.5	–	1095
340	322	322	67.6	(108.0)	34.4	47	1070
330	313	313	67.0	–	33.3	–	1035
320	303	303	66.4	(107.0)	32.2	45	1005
310	294	294	65.8	–	31.0	–	980
300	284	284	65.2	(105.5)	29.8	42	950
295	280	280	64.8	–	29.2	–	935
290	275	275	64.5	(104.5)	28.5	41	915
285	270	270	64.2	–	27.8	–	905
280	265	265	63.8	(103.5)	27.1	40	890
275	261	261	63.5	–	26.4	–	875
270	256	256	63.1	(102.0)	25.6	38	855
265	252	252	62.7	–	24.8	–	840
260	247	247	62.4	(101.0)	24.0	37	825
255	243	243	62.0	–	23.1	–	805
250	238	238	61.6	99.5	22.2	36	795
245	233	233	61.2	–	21.3	–	780
240	228	228	60.7	98.1	20.3	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	–	–	–

Extracted from JIS Handbook "Iron & Steel"

Note (1) 1MPa=1N/mm^2

(2) Value in ( ) is not in practical use, but reference only

Metal Material Cross Reference List

Stainless Steel / Heat Resisting Steel

● Stainless Steel (Ferritic)

JIS	AISI/ASTM	DIN
SUS405	AISI 405	X6CrAl13
SUS429	AISI 429	X10CrAl12
SUS430	AISI 430	X8Cr17
SUS430F	AISI 430F	X12CrMoS17
SUS434	AISI 434	X6CrMo17
SUSXM27	ASTM XM27	

● Stainless Steel (Martensitic)

SUS403	AISI 403	X7Cr13
SUS410	AISI 410	X10Cr13
SUS410S	ASTM 410S	X6Cr13
SUS416	AISI 416	
SUS420J1	AISI 420	X20Cr13
SUS420F	AISI 420F	
SUS431	AISI 431	X22CrNi6
SUS440A	AISI 440A	
SUS440B	AISI 440B	
SUS440C	AISI 440C	
SUS440F	ASTM 440F	

● Stainless Steel (Austenitic)

SUS201	AISI 201	
SUS202	AISI 202	
SUS301	AISI 301	X12CrNi17 7
SUS302	AISI 302	
SUS302B	AISI 302B	
SUS303	AISI 303	X12CrNiS18 8
SUS303Se	AISI 303Se	
SUS304	AISI 304	X5CrNi189
SUS304L	AISI 304L	X2CrNi1911
SUS304N1	AISI 304N	
SUS304N2	ASTM XM21	
SUS305	AISI 305	X5CrNi1812
SUS308	AISI 308	
SUS309S	AISI 309S	
SUS310S	AISI 310S	
SUS316	AISI 316	X5CrNiMo18 10
SUS316L	AISI 316L	X2CrNiMo18 12
SUS316N	AISI 316N	
SUS317	AISI 317	X2CrNiMo18 16
SUS317L	AISI 317L	
SUS321	AISI 321	X10CrNiTi
SUS347	AISI 347	X6CrNiNb18 9
SUS384	AISI 384	
SUSXM7	ASTM XM7	
SUSXM15J1	ASTM XM15	

● Heat Resisting Steel

SUH31		
SUH35	EV8	X53CrMnNiN21 9
SUH36		
SUH37		
SUH38		
SUH309	AISI 309	X15CrNiSi20 1
SUH310	AISI 310	X12CrNi25 21
SUH330	AISI 330	X12NiCrSi36 16
SUH660	ASTM 660	
SUH661	ASTM 661	

● Heat Resisting Steel (Ferritic)

SUH21		CrAl1205
SUH409	AISI 409	X6CrTi12
SUH446	AISI 446	X10CrA124

● Heat Resisting Steel (Martensitic)

SUH1		X45CrSi93
SUH3		
SUH4		X80CrNiSi20
SUH11		
SUH600		
SUH616	ASTM 616	

Carbon Steel / Alloy Steel

● Carbon Steel

JIS	AISI/SAE	DIN
S10C	1010	C10
S12C	1012	C12
S15C	1015	C15
S17C	1017	C17
S20C	1020	C22
S22C	1023	C23
S25C	1025	C25
S28C	1029	C28
S30C	1030	C30
S35C	1035(1037)	C35
S40C	1039(1040)	C40
S43C	1042(1043)	C43
S45C	1045(1046)	C45
S50C	1049	C50
S53C	1050(1053)	C53
S55C	1055	C55
S58C	1060	C58
S09CK	1010	CK10
S15CK	1015	CK15
S20CK	1020	-

● Nickel-Chromium Steel

SNC236	3135	36NiCr6
SNC415	3415	14NiCr10
SNC631	-	-
SNC815	3415,3310	14NiCr14
SNC836	-	-

● Nickel-Chromium Molybdenum Steel

SNCM220	8615,8617 8620,8622	21NiCrMo2
SNCM240	8637,8640	40NiCrMo22
SNCM415	-	-
SNCM420	4320	-
SNCM431	-	-
SNCM439	4340	34CrNiMo6
SNCM447	-	-
SNCM616	-	-
SNCM625	-	-
SNCM630	-	-
SNCM815	-	-

● Chromium Steel

SCr415	5015	15Cr3
SCr420	5120	20Cr4
SCr430	5130	34Cr4
SCr435	5132	37Cr4
SCr440	5140	42Cr4
SCr445	5147	-

● Chromium Molybdenum Steel

SCM415	-	15CrMo5
SCM418	-	-
SCM420	-	-
SCM421	-	22CrMoS35
SCM430	4130	25CrMo4
SCM432	4131	-
SCM435	4135,4137	34CrMo4
SCM440	4140,4142	41CrMo4
SCM445	4145,4147	-
SCM822	-	-

● Manganese Steel, Manganese Chromium Steel

SMn420	1520,1522	-
SMn433	1536	-
SMn438	1541	-
SMn443	1547	-
SMnC420	-	-
SMnC443	-	-

Tool Steel

● Carbon Tool Steel

JIS	AISI/SAE	DIN
SK1	W1-13	-
SK2	W1-11 1/2	C125W
SK3	W1-10	C105W1
SK4	W1-9	-
SK5	W1-8	C80W1
SK6	W1-7	C80W1
SK7	-	C70W2

● High Speed Tool Steel

SKH2	T1	S18-0-1
SKH3	T4	S18-1-2-5
SKH4A	-	-
SKH4B	-	-
SKH5	-	-
SKH10	T15	S12-1-4-5
SKH51	M2	S6-5-2
SKH52	M3-1	-
SKH53	M3-2	S6-5-3
SKH54	M4	-
SKH55	-	S6-5-2-5
SKH56	M36	-
SKH57	-	S10-4-3-10

● Alloy Tool Steel

SKS1	-	-
SKS11	F2	-
SKS2	-	105WCr6
SKS21	-	-
SKS5	-	-
SKS51	L6	-
SKS7	-	-
SKS8	-	-
SKS4	-	-
SKS41	-	-
SKS42	-	-
SKS43	W2-91/2	-
SKS44	W2-81/2	-
SKS3	-	-
SKS31	-	105WCr6
SKS93	-	-
SKS94	-	-
SKS95	-	-
SKD1	D3	X210Cr12
SKD11	D2	X100CrMoV5
SKD12	A2	
SKD2	-	X210CrW12
SKD5	H21	X30WCrV9
SKD61	H13	X40CrMoV5

Others

● Gray Cast Iron

FC100	20 B	GG-10
FC150	25 B	GG-15
FC220	30 B	GG-20
FC250	35 B	GG-25
FC300	45 B	GG-30
FC350	50 B	GG-35

● Spheroidal Graphite Cast Iron (Ductile Cast Iron Nodular Cast Iron)

FCD400	60-40-18	GGG-40
FCD450	60-40-8	GGG-40.3
FCD500	65-45-12	GGG-50
FCD600	80-55-06	GGG-60
FCD700	100-70-03	GGG-70

Iron & Steel, Non-ferrous Metal Cross Reference List

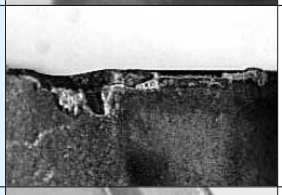
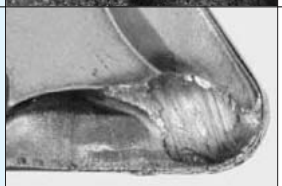
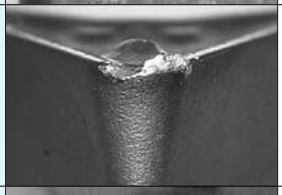
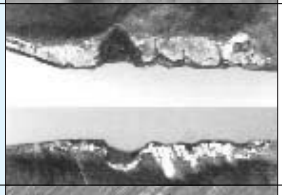
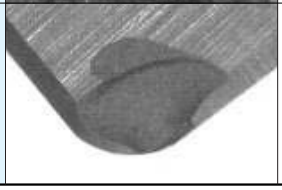
● Steel

Classifiction		JIS Standard Name	Symbol
Structural Steel		Rolled Steel for Welded Structure	SM
		Rerolled Steel	SRB
		Rolled Steel for General Structure	SS
		Light Gauge Steel for General Structure	SSC
		Hot-rolled Steel Plate, Sheet/Strip for Automobile Structural Use	SAPH
Steel Sheet		Cold-rolled Steel Sheet/Strip	SPC
		Hot-rolled Soft Steel Sheet/Strip	SPH
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SGP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STB
		Seamless Steel Pipe for High Pressure Gas Cylinder	STH
		Carbon Steel Pipe for General Structural Use	STK
		Carbon Steel Pipe for Machine structural Use	STKM
		Alloy Steel Pipe for Structural Use	STKS
		Stainless Steel Pipe for Machine and Structural Use	SUS-TK
		Carbon Steel Square Pipe for General Structural Use	STKR
		Alloy Steel Pipe	STPA
		Carbon Steel Pipe for Pressure Service	STPG
		Carbon Steel Pipe for High Temperature Service	STPT
		Carbon Steel Pipe for High Pressure Service	STS
		Stainless Steel Pipe	SUS-TP
Steel for Machine Structural Use		Carbon Steel for Machine Structural Use	SxxC,SxxCK
		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	SK
		Hollow Drill Steel	SKC
		Alloy Tool Steel	SKS,SKD,SKT
		High Speed Tool Steel	SKH
	Special Steel	Free Cutting Carbon Steel	SUM
		High Carbon Chromium Bearing Steel	SUJ
		Spring Steel	SUP
	Stainless Steel	Stainless Steel Bar	SUS-B
		Hot Rolled Stainless Steel Plate, Sheet, and Strip	SUS-HP, SUS-HS
		Cold Rolled Stainless Steel Plate, Sheet, and Strip	SUS-CP, SUS-CS
	Heat Resisting Steel	Heat Resisting Steel Bar	SUH-B, SUH-CB
		Heat Resisting Steel Sheet	SUH-HP, SUH-CP
	Super Alloy	Corrosion-resisting and Hot-resisting Superalloys Bar	NCF-B
		Corrosion-resisting and Hot-resisting Superalloys Plate and Sheet	NCF-P
Forged Steel		Carbon Steel Forging	SF
		Chromium Molybdenum Steel Forging	SFCM
		Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast Iron		Gray Cast Iron	FC
		Spheroidal Graphite Cast Iron	FCD
		Blackheart Malleable Cast Iron	FCMB
		Whiteheart Malleable Cast Iron	FCMW
		Pearlitic Malleable Cast Iron	FCMP
Cast Steel		Carbon Cast Steel	SC
		High Tensile Strength Carbon Cast Steel & Low Alloy Cast Steel	SCC
		Stainless Cast Steel	SCS
		Heat Resisting Cast Steel	SCH
		High Manganese Cast Steel	SCMnH
		Cast Steel for High Temperature and High Pressure Service	SCPH

● Non-ferrous Metal

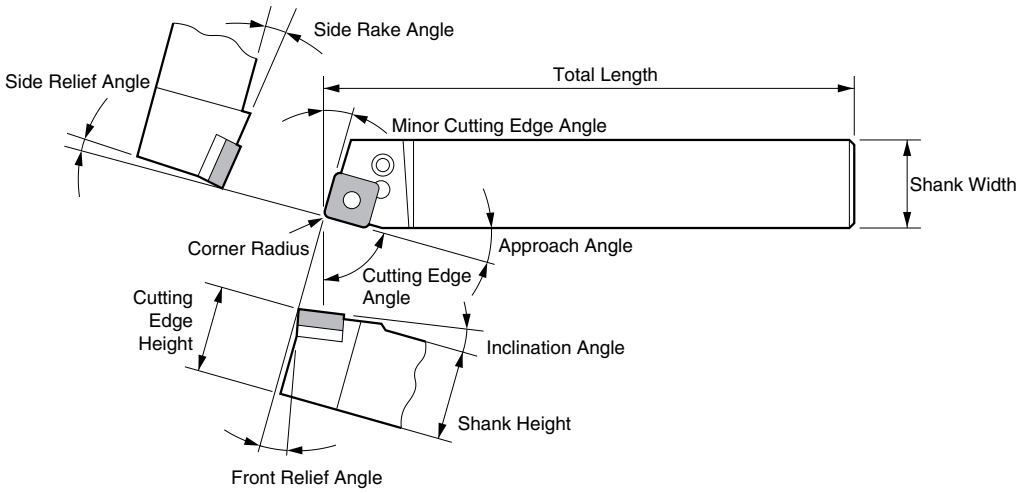
Classifiction	JIS Standard Name	Symbol
Copper	Copper and Copper Alloy Sheet/Strip	CxxxxP CxxxxPP CxxxxR
	Copper and Copper Alloy Welded Pipe and Tube	CxxxxBD CxxxxBDS CxxxxBE
Aluminum and Aluminum Alloy	Aluminum and Al. Alloy Sheet/Strip	AxxxxP AxxxxPC
	Aluminum and Al. Alloy Rod, Bar, and Wire	AxxxxBE AxxxxBES AxxxxBD AxxxxBDS AxxxxW AxxxxWS
	Aluminum and Al. Alloy (Extruded)	AxxxxS
	Aluminum and Al. Alloy Forging	AxxxxFD AxxxxFH
Magnesium Alloy	Magnesium Alloy Sheet and Plate	MP
Nickel Alloy	Nickel Copper Alloy Sheet and Plate	NCuP
	Nickel Copper Alloy Rod and Bar	NCuB
Titanium	Titanium Rod and Bar	TB
Casting	Brass Casting	CAC20x
	High Strength Brass Casting	CAC30x
	Bronze Casting	CAC40x
	Phosphoric Bronze Casting	CAC50x
	Aluminum Bronze Casting	CAC70x
	Aluminum Alloy Casting	AC
	Magnesium Alloy Casting	MC
	Zinc Alloy Die Casting	ZDCx
	Aluminum Alloy Die Casting	ADC
	Magnesium Alloy Die Casting	MD
	White Metal	WJ
	Aluminum Alloy Casting for Bearing	AJ
	Lead Alloy Casting for Bearing	KJ

Problems and Countermeasures

Typical Problems		Phenomenon	Causes	Countermeasures
Nose Wear		·Deterioration of surface roughness and dimensional accuracy	·Too high V_C ·End of tool life	·Reduce V_C ·Change to higher wear resistant grade
Notching		·Burr formation ·Cutting resistance increase	·Too high f and V_C	·Sharper cutting performance ·Reduce V_C ·Change to higher heat resistant grade
Crater Wear		·Chip control deterioration ·Surface finish deterioration (peeled surface)	·Too high V_C	·Reduce V_C ·Change to high speed type like Cermet or Al_2O_3 coated insert
Plastic Deformation		·Work dimension's change ·Crack at nose	·Too high cutting load ·Inappropriate tool grade	·Change to harder grade ·Reduce feed rate and ap
Crack from Wear		·Surface finish's sudden deterioration ·Work's out of dimension	·Too high V_C	·Reduce the pre-set tool life ·Change to higher wear resistant grade
Chipping		·Cutting resistance increase ·Surface roughness deterioration	·Too high f ·Chattering ·Lack of insert toughness	·Reduce feed rate and *ap* ·Change to more rigid toolholder ·Change to tougher grade
Crack from Welding or Built-up Edge		·Surface finish deterioration ·Cutting resistance increase	·Too low V_C	·Increase V_C ·Improve sharp cutting performance (rake angle, chamfer)
Mechanical Fracture		·Sudden crack ·Unstable tool life	·Too high f and *ap* ·Chattering	·Change to tougher grade ·Enlarge chamfer ·Enlarge Corner-R ·Change to more rigid toolholder
Fracture from Thermal Crack		·Crack by heat cycle ·Possible in interrupted cutting and milling	·Too high V_C and f	·Reduce f ·Reduce V_C ·Change to dry cutting
Flaking		·Possible in high hard material cutting ·Possible in machining with chattering	·Lack of insert toughness ·Lack of toolholder's rigidity	·Change to harder grade (TiC-base ceramic → CBN.) ·Change to more rigid toolholder ·Change edge preparation

Terms and Angles of Toolholder

■ Terms and Angles of Toolholder



■ Function of Tool Angle

Tool Angle	Hardness	Function	Effect
Rake Angle	Side Rake Angle	· Affects cutting resistance, cutting heat, chip evacuation and tool life.	· If it is positive (+) angle, sharper cutting performance is obtained. (less cutting resistance, less edge strength) · Positive (+) angle is recommended to good-machinability work or thin work. · Smaller rake angle or negative (–) angle is recommended when a stronger edge is required as the case of scale cutting or interrupted cutting.
	Inclination Angle		
Relief Angle	Front Relief Angle Side Relief Angle	· Avoids the tool's contact to the work surface, except the cutting edge.	· When it is small, cutting edge becomes strong, but wear at relief faces becomes large shortly and tool life becomes short too.
Edge Angle	Cutting Edge Angle	· Affects chip control and the direction of cutting force	· When it is large, chip thickness becomes thick and chip control improves.
	Approach Angle	· Affects chip control and the direction of cutting force	· When it is large, chip thickness becomes thin and chip control worsens, but cutting force is dispersed and edge strength improves. · When it is small, chip control ability improves.
	Minor Cutting Edge Angle	· Prevents friction between cutting edge and work surface.	· When it is large, edge strength deteriorates.

Formula

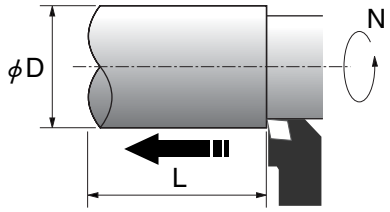
● Cutting Speed

$$V_C = \frac{\pi \times D \times N}{1000}$$

V_C: Cutting Speed [m/min]

D : Workpiece Diameter [mm]

N : Spindle Revolution [min^{-1}]



● Power Requirement

$$P_{KW} = \frac{Ks \times V \times ap \times f}{6120 \times \eta}$$

$$P_{HP} = \frac{Ks \times V \times ap \times f}{4500 \times \eta}$$

P_{KW} : Power Requirement [kW]

P_{HP} : Power Requirement (Horse Power) [HP]

V_C : Cutting Speed [m/min]

ap : depth of cut [mm]

f : Feed Rate [mm/rev]

K_S : Specific Cutting Resistance [kgf/mm^2]

η : Mechanical Efficiency (0.7~0.8)

Ks Figure	
Soft 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

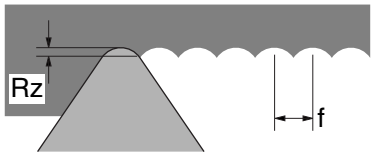
● Surface Roughness

$$Rz = \frac{f^2}{8 \times R} \times 1000$$

Rz : Theoretical (Geometrical) Surface Roughness [μm]

f : Feed Rate [mm/rev]

R : Corner Radius of Insert [mm]



● Metal Removal Rate

$$Q = V_C \times ap \times f$$

Q : Metal Removal Rate [cm^3/min]

V_C: Cutting Speed [m/min]

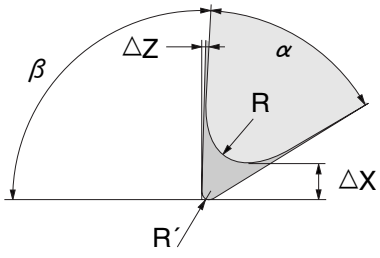
ap: depth of cut [mm]

f : Feed Rate [mm/rev]

● Edge Position Compensation

$$\Delta X = (R - R') \times \left\{ \frac{\cos\left(\frac{\alpha}{2} + (\beta - 90°)\right)}{\sin\frac{\alpha}{2}} - 1 \right\}$$

$$\Delta Z = (R - R') \times \left\{ \frac{\sin\left(\frac{\alpha}{2} + (\beta - 90°)\right)}{\sin\frac{\alpha}{2}} - 1 \right\}$$



ΔX : X-axis Direction Edge Position Compensation [mm]

ΔZ : Z-axis Direction Edge Position Compensation [mm]

R : Corner-R before Change [mm]

R': Corner-R after Change [mm]

α : Insert Corner Angle [°]

β : Toolholder's Cutting Edge Angle [°]

Toolholder Type	Insert Corner Angle α	Cutting Edge Angle β	ΔX	ΔZ
PCLN	80°	95°	0.100× (R-R')	0.100× (R-R')
PTGN	60°	91°	0.714× (R-R')	0.030× (R-R')
PDJN	55°	93°	0.866× (R-R')	0.099× (R-R')
PDHN	55°	107.5°	0.531× (R-R')	0.531× (R-R')
PVLN	35°	95°	2.072× (R-R')	0.273× (R-R')
PVPN	35°	117.5°	1.351× (R-R')	1.351× (R-R')
PSBN	90°	75°	0.225× (R-R')	-0.293× (R-R')

Example: Compensation when changing corner-R from 0.8 to 0.4, using PCLN type toolholder.

ΔX=0.100× (0.8-0.4)=0.04 (mm)

ΔZ=0.100× (0.8-0.4)=0.04 (mm)

Formula (Cutting Time) — Turning

● Cutting Time (External Turning Case 1: Machining at 1 Pass)

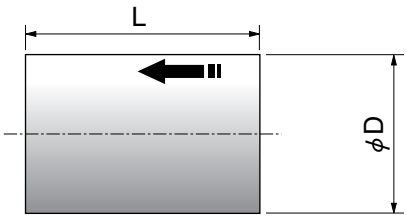
· At Constant Revolution

$$T = \frac{60 \times L}{f \times N}$$

· At Constant Cutting Speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times f \times V_C}$$

T : Cutting Time [second]
L : Cutting Length [mm]
f : Feed Rate [mm/rev]
N : Spindle Revolution [min^{-1}]
D : Workpiece Diameter [mm]
V_C Cutting Speed [m/min]



● Cutting Time (External Turning Case 2: Machining at Multi-Pass)

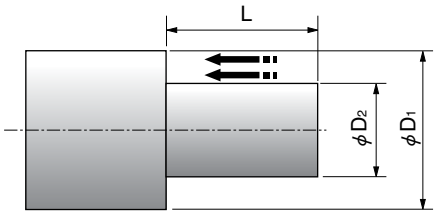
· At Constant Revolution

$$T = \frac{60 \times L}{f \times N} \times n$$

· At Constant Cutting Speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times f \times V_C} \times n$$

T : Cutting Time [second]
L : Cutting Length per Pass [mm]
a*p*: depth of cut per Pass [mm]
f : Feed Rate [mm/rev]
N : Spindle Revolution [min^{-1}]
D_1 : Max. Diameter of Workpiece [mm]
D_2 : Min. Diameter of Workpiece [mm]
V_C: Cutting Speed [m/min]
n : Number of Pass= (D_1-D_2) /a*p*/2 (if it is indivisible, obtain integer by rounding up one place of decimals.)



● Cutting Time (Facing)

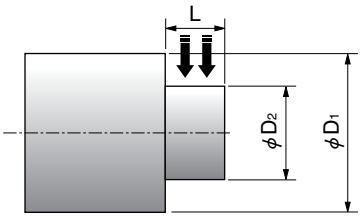
· At Constant Revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times N} \times n$$

· At Constant Cutting Speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f \times V_C} \times n$$

T : Cutting Time [second]
T_1 : Machining Time before reaching Max. Spindle Revolution [second]
L : Cutting Length [mm]
a*p*: depfh of cut per Pass [mm]
f : Feed Rate [mm/rev]
N : Spindle Revolution [min^{-1}]
D_1 : Max. Diameter of Workpiece [mm]
D_2 : Min. Diameter of Workpiece [mm]
V_C: Cutting Speed [m/min]
n : Number of Pass=L/a*p* (if it is indivisible, obtain integer by rounding up one place of decimals.)



● Cutting Time (Grooving)

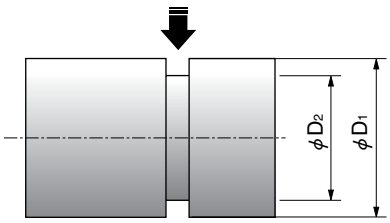
· At Constant Revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times N}$$

· At Constant Cutting Speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f \times V_C}$$

T : Cutting Time [second]
T_1 : Machining Time before reaching Max. Spindle Revolution [second]
L : Cutting Length [mm]
f : Feed Rate [mm/rev]
N : Spindle Revolution [min^{-1}]
D_1 : Max. Diameter of Workpiece [mm]
D_2 : Min. Diameter of Workpiece [mm]
V_C: Cutting Speed [m/min]



● Cutting Time (Cutting Off)

· At Constant Revolution

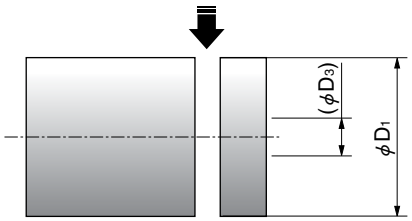
$$T = \frac{60 \times D_1}{2 \times f \times N}$$

· At Constant Cutting Speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3) \times (D_1 - D_3)}{4000 \times f \times V_C}$$

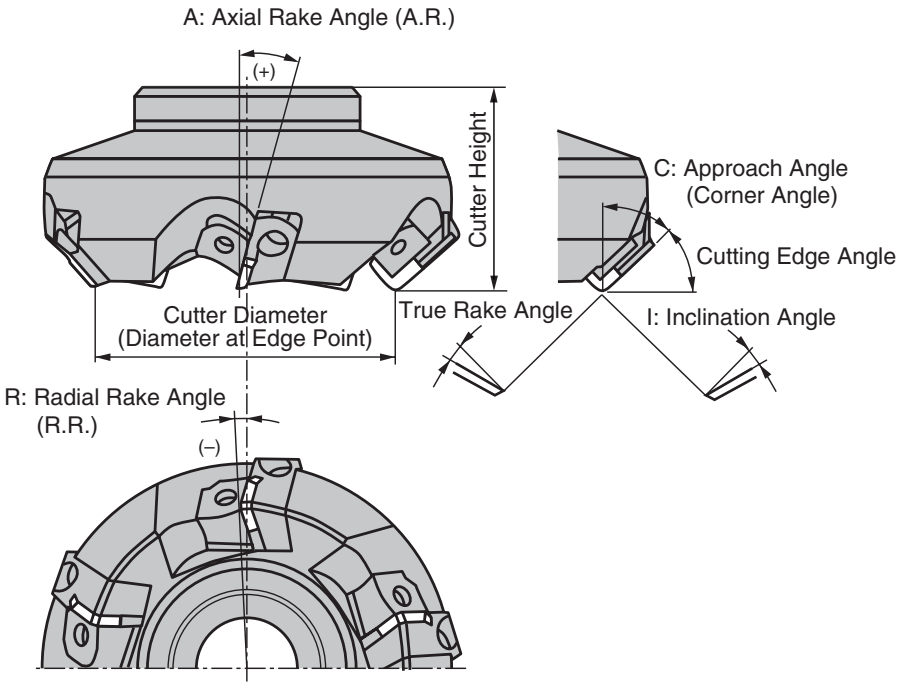
$$T_3 = T_1 + \frac{60 \times D_3}{2 \times f \times N_{max}}$$

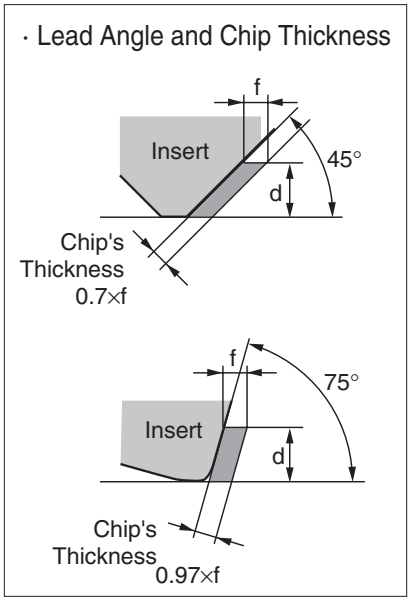
T : Cutting Time [second]
T_1 : Machining Time before reaching Max. Spindle Revolution [second]
T_3 : Machining Time when reaching Max. Spindle Revolution [second]
f : Feed Rate [mm/rev]
N : Spindle Revolution [min^{-1}]
Nmax : Max. Spindle Revolution [min^{-1}]
D_1 : Max. Diameter of Workpiece [mm]
D_3 : Diameter when reaching Max. Spindle Revolution [mm]
V_C: Cutting Speed [m/min]



Terms and Angles of Milling Cutter

■ Terms and Angles of Milling Cutter





■ Function of Tool Angle

Symbol	Name	Function	Effect
A	Axial Rake Angle : A.R.	Controlls chip flow direction and cutting force	When it is positive --- Good cutting performance and less chip welding
R	Radial Rake Angle : R.R.	Controlls chip flow direction and cutting force	When it is negative --- Good chip evacuation
C	Approach Angle	Controlls chip thickness and chip flow direction	When it is large --- Thinner chip thickness Less cutting load
T	True Rake Angle	Actual rake angle	When it is positive --- Good cutting performance and less chip welding, but lower edge strength When it is negative --- Higher edge strength but easier to cause chip's welding
I	Inclination Angle	Controlls chip flow direction	When it is positive --- Good chip evacuation Less cutting resistance Lower edge strength at corner part

$\tan T = \tan R \times \cos C + \tan A \times \sin C$

$\tan I = \tan A \times \cos C - \tan R \times \sin C$

Formula

Milling

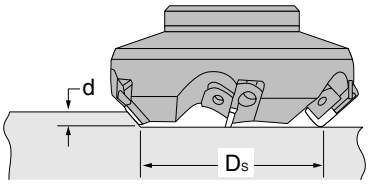
● Cutting Speed

$$V_C = \frac{\pi \times D_S \times n}{1000}$$

V_C : Cutting Speed [m/min]

D_S : Cutter Diameter [mm]

n : Spindle Revolution [min^{-1}]



● Table Feed & Feed Rate

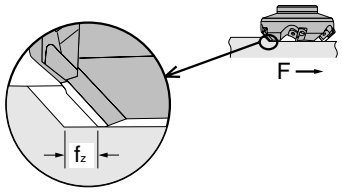
$$f_z = \frac{fv}{Z \times n}$$

f_z : Feed Rate [mm/tooth]

fv : Table Feed [mm/min]

Z : Number of Insert

n : Spindle Revolution [min^{-1}]



● Power Requirement

$$P_{KW} = \frac{K_S \times Q}{6120 \times \eta} = \frac{K_S \times W \times fv \times ap}{6120000 \times \eta}$$

$$= \frac{K_S \times W \times f_z \times Z \times n \times ap}{6120000 \times \eta}$$

$$P_{HP} = \frac{6120}{4500} \times P_{KW}$$

P_{KW} : Power Requirement [kW]

P_{HP} : Power Requirement (Horse Power)[HP]

W : Cutting Width [mm]

fv : Table Feed [mm/min]

f_z : Feed Rate [mm/tooth]

Z : Number of Insert

n : Spindle Revolution [min^{-1}]

ap : depth of cut [mm]

K_S : Specific Cutting Resistance [kgf/mm^2]

η : Mechanical Efficiency (0.7~0.8)

Ks Figure	
Soft 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

● Metal Removal Rate

$$Q = \frac{W \times fv \times ap}{1000} = \frac{W \times f_z \times Z \times n \times ap}{1000}$$

Q : Metal Removal Rate [cm^3/min]

W : Chip's Width [mm]

fv : Table Feed [mm/min]

f_z : Feed Rate [mm/tooth]

Z : Number of Insert

n : Spindle Revolution [min^{-1}]

ap : depth of cut [mm]

● Cutting Time

$$T = \frac{60 \times L'}{F} = \frac{60 \times L'}{f_z \times Z \times n}$$

T : Cutting Time [second]

L' : Total Table Transfer Length [mm]

(=L+Ds+2α)

L : Work Length [mm]

D_S : Cutter Diameter [mm]

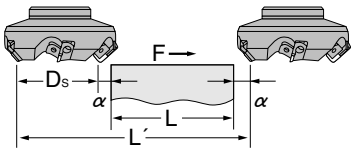
α : Idling Distance [mm]

fv : Table Feed [mm/min]

f_z : Feed Rate [mm/tooth]

Z : Number of Insert

n : Spindle Revolution [min^{-1}]



Formula

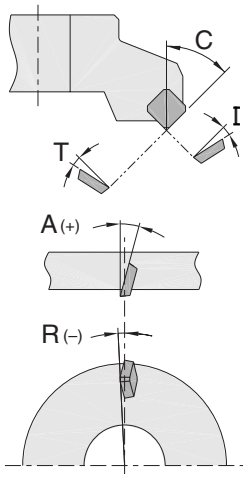
Milling

● True Rake Angle

$$\tan T = \tan R \times \cos C + \tan A \times \sin C$$

● Inclination Angle

$$\tan I = \tan A \times \cos C - \tan R \times \sin C$$



A : Axial Rake Angle A.R. [°] (-90°<A<90°)

R : Radial Rake Angle R.R. [°] (-90°<R<90°)

C : Approach Angle [°] (0°<C<90°)

T : True Rake Angle [°] (-90°<T<90°)

I : Inclination Angle [°] (-90°<I<90°)

● Ball-Nose Endmill Cutting Speed & Revolution

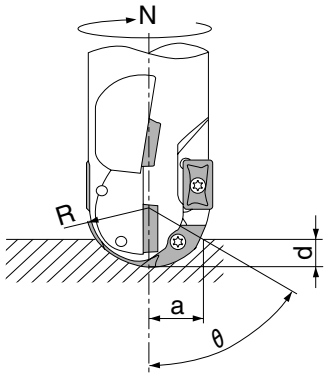
$$n = \frac{1000 \times V_{Ca}}{2 \times \pi \times \sqrt{a\,(2R-d)}}$$

n : Spindle Revolution [min^{-1}]

R : Radius of Ball-Nose Endmill (Ball part's radius [mm])

a_p : depth of cut [mm]

V_{Ca} : Cutting Speed at Point "a" [m/min]



Drilling

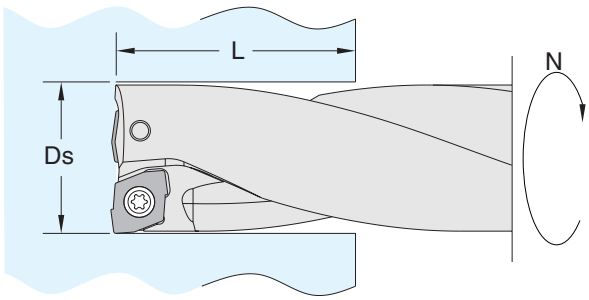
● Cutting Speed

$$V_C = \frac{\pi \times D_s \times n}{1000}$$

V_C : Cutting Speed [m/min]

D_s : Drill Diameter [mm]

n : Spindle Revolution [min^{-1}]



● Feed Rate (Milling)

$$fv = fz \times Z \times n$$

fv : Table Feed [mm/min]

fz : Feed Rate [mm/tooth]

Z : Number of Insert (Number of Insert=1)

n : Spindle Revolution [min^{-1}]

● Cutting Time

$$T = \frac{60 \times L}{fz \times n} = \frac{60 \times \pi \times D_s \times L}{1000 \times V_C \times f}$$

T : Cutting Time [second]

L : Drilling Depth [mm]

fz : Feed Rate [mm/rev]

n : Spindle Revolution [min^{-1}]

D_s : Drill Diameter [mm]

V_C : Cutting Speed [m/min]

● Power Requirement (Reference Value)

$$P_{kw} = \frac{D_s}{20} \times \frac{V_C}{100} \times \left(1 + \left(\frac{2.5 \times f}{0.1}\right)\right)$$

P_{kw} : Power Requirement [kW]

D_s : Drill Diameter [mm]

V_C : Cutting Speed [m/min]

fz : Feed Rate [mm/rev]

Troubleshooting (Turning)

Trouble	Trouble Item	Check Item / Measures	Insert Grade: Change to Harder Grade	Insert Grade: Change to Tougher Grade	Insert Grade: Change to More Thermal Shock Resistant Grade	Insert Grade: Change to More Welding Resistant Grade	Cutting Conditions: Cutting Speed - V_c (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Feed Rate - f (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Depth of Cut - a_p (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Tool Path Review	Cutting Conditions: Coolant: Wet	Cutting Conditions: Coolant: Dry	Tool Geometry: Chipbreaker Review	Tool Geometry: Rake Angle (Larger ↑ Smaller ↓)	Tool Geometry: Corner-R (Larger ↑ Smaller ↓)	Tool Geometry: Approach Angle (Larger ↑ Smaller ↓)	Tool Geometry: Edge Strength/ Honing (Larger ↑ Smaller ↓)	Tool Geometry: Change to Higher Tolerance (M→G)	Tool Geometry: Toolholder Rigidity	Setting: Work/Tool Installation	Setting: Overhang Length	Machine: Power, Rigidity
Unstable Dimension	Unstable Work Dimension	Unsuitable Insert Tolerance																●				
		Work or Tool's Escape											●	●↑	●↓	●↓			●	●	●	●
	Frequent Offsetting	Flank Wear Increase	●												●↑							
		Unsuitable Cutting Conditions					●↓	●↑														
		Built-up Edge				●	●↑															
Surface Roughness	Poor Surface Roughness	Poor Cutting by Tool Wear	●			●	●↓				●		●	●↑	●↑		●↓	●				
		Chipping		●				●↓	●↓				●		●↑		●↑			●	●	●
		Welding, Built-up Edge				●	●↑				●		●	●↑			●↓	●				
		Unsuitable Cutting Conditions					●↑	●↓	●↓		●											
		Unsuitable Tool Geometry											●		●↑		●↓	●				
		Vibration, Chattering		●			●↓	*1 ●↓	●↓				●	●↑	●↓	●↓	●↓		●	●	●	●
Heat	Deterioration of Accuracy or Tool Life by Cutting Heat	Unsuitable Cutting Conditions					●↓	●↓	●↓		●											
		Unsuitable Tool Geometry	●										●	●↑			●↓					
Burr, Chipping	Burr	Unsuitable Cutting Conditions					●↓	●↑		●	●											
		Unsuitable Tool Geometry	●										●	●↑	●↓	●↓	●↓					
	Chipping at Work	Unsuitable Cutting Conditions						●↓	●↓	●												
		Unsuitable Tool Geometry	●										●	●↑	●↑	●↑	●↓		●	●	●	●
	Plucked Surface	Unsuitable Cutting Conditions					●↑	*2 ●↓			●											
		Unsuitable Tool Geometry	●			●							●	●↑			●↓					
Edge Damage	Wear Increase at Relief Face, Rake Face	Flank Wear	●				●↓				●		●	●↑	●↑		●↓					
		Rake Face Wear	●				●↓	●↓	●↓		●		●	●↑		●↑						
	Notching	Notching				●	●↓				●											
	Chipping	Vibration, Chattering		●				●↓	●↓				●			●↑	●↑		●	●	●	●
	Crack	Unsuitable Tool Geometry		●	●			●↓	●↓				●		●↑	●↑	●↑		●	●	●	●
	Thermal Crack	Work Hardness, Unsuitable Cutting Conditions			●		●↓	●↓	●↓			●	●	●↑			●↓					
	Edge Nose Deformation	Edge Nose Deformation at Interrupted Cutting	●				●↓	●↓	●↓				●	●↓	●↑	●↑	●↑					
	Built-up Edge	Work Hardness, Unsuitable Cutting Conditions				●	●↑	●↑			●		●	●↑			●↓	●				
Chip Control	Long, Tangling Chips	Unsuitable Cutting Conditions					*3 ●↓	●↑	●↑	●		●										
		Unsuitable Tool Geometry											●		●↓	●↓						
	Chips scattering	Unsuitable Cutting Conditions						●↓	●↓			●										
		Unsuitable Tool Geometry											●		●↑	●↑						

*1) To prevent chattering, the higher f may be suitable.
*2) To prevent plucked surface, the higher f may be suitable.
*3) When using X-chipbreaker insert for soft steel and low carbon steel, the higher V_c makes chips short.

Troubleshooting (Drilling)

Trouble	Trouble Item	Change to Harder Grade (Insert Grade)	Change to Tougher Grade (Insert Grade)	Cutting Speed - V_c (Higher ↑ Lower ↓) (Cutting Conditions)	Feed Rate - f (Higher ↑ Lower ↓) (Cutting Conditions)	Coolant Discharge Condition (Cutting Conditions)	Chipbreaker Review (Tool Geometry)	Inner Edge's Center Height Check (Core Dia. Check) (Larger ↑ Smaller ↓) (Tool Geometry)	Tool Rigidity Improvement (Short Type) (Tool Geometry)	Work/Tool Installation (Setting)	Insert Installation (Setting)	Offset Check (Setting)	Adjustable Sleeve Usage (Setting)	Power, Rigidity (Machine)
Edge Damage	Unusual Wear													
	Unsuitable Cutting Speed (too high)	●		●↓										
	Unsuitable Cutting Speed (too low)		●	●↑										
	Unsuitable Coolant Discharge					●								
	Poor Rigidity of Machine/Work									●				●
	Small Hole Dia.											*1 ●	●	
	Unsuitable Tool Grade	●												
	Inner Edge's Crack													
	No core, Too Small Core							●↑						
	Poor Rigidity of Machine/Work								●	●				●
	Unsuitable Drilling Start				●↓									
	High Hardness Work	●		●↓	●↓									
	Clogged Chips			●↑				●↓						
	Unstable Insert Installation										●			
	Outer Edge's Crack													
	Poor Rigidity of Machine/Work									●				●
	Unsuitable Drilling Start				●↓									
	High Hardness Work	●		●↓	●↓									
	Poor Chip Control		●	●↑										
	Unstable Insert Installation										●			
Toolholder, Others	Scratches on Tool Body													
	Poor Rigidity of Machine/Work									●				●
	Inaccurate Tool Installment											*1 ●	●	
	Clogged Chips			●↑	●↓									
	Unsuitable Drilling Start				●↓									
	Poor Hole Dia. Accuracy / Surface Finish													
	Poor Rigidity of Machine/Work									●				●
	Poor Rigidity of Toolholder								●		●			
	Inaccurate Tool Installment											*1 ●	●	
	Clogged Chips			●↑	●↓			●↓						
	Large Core Dia.							●↓						
	Unsuitable Drilling Start				●↓									
	Unsuitable Coolant Discharge					●								
	Large Chattering/Vibration	Unsuitable Cutting Conditions, Installation			●↑	●↓				●	●				●
	Long Chips													
	Unsuitable Cutting Conditions				●↑									
	Unsuitable Chipbreaker						●							
	Machine Stop	Lack of Machine Power			●↓	●↓		●							●

*1) It is important at lathe operation.

Troubleshooting (Milling)

Trouble	Trouble Item	Check Item / Measures	Insert Grade: Change to Harder Grade	Insert Grade: Change to Tougher Grade	Insert Grade: Change to More Thermal Shock Resistant Grade	Insert Grade: Change to More Welding Resistant Grade	Cutting Conditions: Cutting Speed - V_c (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Feed Rate - f (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Depth of Cut - a_p (Higher (Larger) ↑ Lower (Smaller) ↓)	Cutting Conditions: Cutter Dia. Cutting Width Review	Cutting Conditions: Tool Path Review	Cutting Conditions: Coolant: Usage of Mist	Cutting Conditions: Coolant: Dry	Tool Geometry: Insert with Chipbreaker	Tool Geometry: Relief Angle (Larger ↑ Smaller ↓)	Tool Geometry: Corner Angle (Larger ↑ Smaller ↓)	Tool Geometry: Edge Strength / Honing (Larger ↑ Smaller ↓)	Tool Geometry: Insert Number (More ↑ Less ↓)	Tool Geometry: Insert Pocket (Larger ↑ Smaller ↓)	Tool Geometry: Wiper Edge (Relief Angle) Review	Tool Geometry: Insert Runout Check	Tool Geometry: Cutter Rigidity	Setting: Work/Tool Installation	Setting: Overhang Length	Machine: Power, Rigidity
Edge Damage	Flank Wear Increase	Unsuitable Cutting Conditions					●↓					●														
		Unsuitable Tool Geometry	●												●↑		●↓			●						
	Rake Face Wear Increase	Unsuitable Cutting Conditions					●↓	●↓	●↓			●														
		Unsuitable Tool Geometry	●												●↑	●↑	●↓									
	Chipping, Crack	Unsuitable Cutting Conditions						●↓	●↓	●	●															
		Unsuitable Tool Geometry		●											●↓	●↑	●↑			●	●	●	●	●	●	
	Edge Breakage by Thermal Shock	Unsuitable Cutting Conditions					●↓	●↓	●↓				●													
		Unsuitable Tool Geometry			●										●↑		●↓									
	Built-up Edge	Unsuitable Cutting Conditions					●↑	●↑				●														
		Unsuitable Tool Geometry				●									●↑		●↓									
Machining Accuracy	Poor Surface Finish	Unsuitable Cutting Conditions					●↑	●↓	●↓			●														
		Unsuitable Tool Geometry	●			●											●↓	●↓		●	●		●	●	●	
	Burr	Unsuitable Cutting Conditions					●↓	●↓	●↓	●	●															
		Unsuitable Tool Geometry													●↑	●↓	●↓			●						
	Plucked Surface	Unsuitable Cutting Conditions						●↓	●↓		●															
		Unsuitable Tool Geometry													●↑	●↑	●↓	●↑		●						
	Poor Planeness/Parallelness	Work or Tool's Escape						●↓	●↓			*5 ●		●	●↑	●↓	●↓	●↓		●	●	●	●	●	●	
Others	Large Chattering, Vibration	Unsuitable Cutting Conditions, Installation					●↓	*1 ●↓	*2 ●↓	●	*4 ●			●	●↑	●↓	●↓	●↓					●	●	●	●
	Biting Chips	Unsuitable Cutting Conditions					●↑	*3 ●↓		●		*6 ●	●													
		Unsuitable Tool Geometry												●	●↑			●↑	●							

*1) To prevent chattering, the higher feed rate may be suitable.
*2) To prevent chatteing, the larger a*p* may be suitable.
*3) Higher feed rate may be suitable.
*4) Down-cut method is recommended to Helical Endmilling.
*5) If the surface is warped by cutting heat.
*6) Compressed air is recommended.

Insert Grades Cross Reference List

● Note: This list is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

● Cermet

Class	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Seco	Sumitomo	Toshiba	Kennametal
P01	TN30 **PV30**	LN10 CX50	CH350	NX1010	T3N T15			T110A	NS520 **AT520**	KT125 HTX
P10	TN6020 TN60 **PV60** **PV7020**	LN10 CX50 NIT CX75	CH350 **CZ25**	NX252 **AP25N**	T15 C30 N20	CT5015 CT525	CM C15M	T2000Z T1200A	NS520 **AT520** **AT530**	KT315 KT175 HT2
P20	TN6020 TN90 TN100M **PV90** **PV7020**	CX50 NAT CX75 CX90	CH550 CH7030 **CZ1025**	NX2525 NX335 **AP25N** **UP35N**	N40 C50	CT530 **GC1525**	C15M	T2000Z T1200A T130A T3000Z	NS530 **AT530** **GT530**	PS5
P30		CX90 CX99 SUZ		NX4545 **VP45N**				T3000Z T250A	NS530 NS540	
M10	TN6020 TN60 **PV60** **PV7020**	LN10	CH350	NX2525		CT5015 CT525	CM C15M	T110A	NS520 **AT520** **AT530** **GT530**	KT315 KT125
M20	TN6020 TN90 TN100M **PV90** **PV7020**	CX50 **NIT** CX75 **NAT**	CH550 CH7030 **CZ1025**	NX2525		CT530 **GC1525**	C15M	T2000Z T1200A	NS530 N308	KT175 HT2 PS5
M30		CX75 CX90 CX99 SUZ		NX4545			C15M	T250A T3000Z	NS540	
K01	TN30 **PV30**	LN10		NX1010	T3N T15			T110A	NS520 **AT520** **AT530 GT530**	
K10	TN60 TN6020 **PV60** **PV7020**	LN10	CH350	NX2525 **AP25N**	T3N T15			T2000Z T1200A	NS520 **AT520** **AT530 GT530**	KT315 HTX
K20		NIT		NX2525 **AP25N**						

● Boldface grade shows PVD Coated Cermet.

● Coated Carbide

Class	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Seco	Sumitomo	Toshiba	Kennametal
P01	CR7015 **PR915**	JC110V JC5003	GM10 HC5000	UE6005		GC4015	TP1000 TX100	AC700G	T9005 TD905 T7005	KC910
P10	CR7015 **PR730** **PR830** **PR915** **PR930**	JC110V JC215V JC730U JC5003 JC5030	GM10 GM20 GM8015	UE6005 UE6010 UC6010 UE6020	CP5	GC4015 **GC1025** GC3115	TP1000 TP100 **CP200** TX150	AC700G AC2000	T9015 TD905 TD915 T715X	KC9110 KC9010 KC5010
P20	CA5025 CR9025 **PR730** **PR830** **PR930**	JC110V JC215V JC730U **JC5015** JC5030 JC5040	GM8020 GM20 GM25 **CY150**	UE6010 UC6010 UE6020 F7030 **UP20M**	CP5 **QM1** **VM1**	GC4025 LC25 GC4020 GC4030 **GC4125**	TP200 T250M T25M T20M CP250	AC2000 AC3000	T9015 T9025 TD915 TD920 T7020	KC9125 KC9025 KC8050
P30	CA5025 CR9025 **PR660**	JC215V JC325V **JC5015** JC5040	GM8035 **CY250** **HC844** **CY9020**	UE6035 F7030 **VP15TF**	**ZM3** **QM3**	GC2135 GC4025 GC4030 GC4035 GC4040	TP200 T250M T25M **F25M** **F30M** CP300 **CP500**	AC3000 AC230	T9025 T9035 T725X TD930 T325 **GH330** **AH330 AH120** **AH740**	KC9040 KC5025
P40		JC325V JC540V	GX30 **CY250** **HC844**	UE6035	**ZM3** **QM3**	GC1020 GC1120 **GC2145** GC4040 GC235	TP40 TP300 T60M T25M **CP500**	AC230 **ACZ330** **ACZ350**	T9035 TD930 **AH120**	KC9045
M10	CA6015 **PR730** **PR830** **PR915**	JC110V	GM10 GM8015	US7020	CP2 CP5	GC2015 **GC1025**	TP100 **CP200**	EH10Z EH510Z	TD915 T715X	KC9110 KC5010 KC9215 KC9010
M20	CA6015 **PR660** **PR730** **PR830** **PR930**	JC215V JC730U JC1341 **JC5015** JC5030 JC5040	GM8020 GM20 GM25	UC7020 F7030 **UP20M** **VP10RT**	CP2 CP5	GC2025 GC2030 **GC4125** **GC1025**	TP200 T250M T25M **F20M** **F25M F30M** **CP500**	EH20Z EH520Z AC304	T6020 T725X GH330 **AH330**	KC8050 KC9225 KC9025 KC9125
M30	**PR660**	JC215V JC325V **JC5015** JC5030 JC5040	**GF30 CY250** GX30 **CY9020**	US735 F7030 **VP15TF**		**GC1020** GC1120 GC2035 GC2040 GC2135	TP300 T250M T25M **F40M** **CP250 CP500**	AC304 AC3000 **ACZ350**	T6030 T325 **AH120**	KC9240 KC9040
M40		JC325V JC450V				**GC2145**	TP40	**ACZ350**	**AH140**	KC9245 KC9045
K01	CA4010 **PR510**	JC105V JC600	GM3005	UC5005 UC5015		GC3005 GC3015 K05A S05F	TX100	AC300G	T5010 **AH110**	KC9315 KC910 KC5410
K10	CA4010 **PR510** **PR610**	JC105V JC110V JC600 JC610	GM3005 GM8015 **CY100H CY10H**	UC5015 UE6010 F5010 **VP10RT**	CP2 CP5	GC1005 GC3005 GC3015 GC3115	TX150 T150M F15M **CP200**	AC300G AC700G AC211 **EH10Z** **EH510Z**	T5010 T5020 T1015 T1020 **GH110 AH110**	KC5010 KC7310 KC9010
K20	CA4010 **PR610**	JC110V JC215V JC610 **JC5015**	GM8015 **GF30** **CY9020**	UC6010 **VP15TF**	CP5 **QM1**	**GC1020 GC1120** GC3020 GC3025 GC4025 K20W	TX150 TP200 T150M T250M T25M **CP200**	AC700G AC2000 **EH520Z EH20Z** **ACZ310**	T5020 **AH120**	KC8050 KC9120 KC9325 KC9025
K30		JC215V JC610		**VP15TF**	**QM1**	GC3040 **GC4125**	TP200 T250M T25M	AC2000		

● Boldface grade shows PVD Coated Carbide.

Insert Grades Cross Reference List

● Note: This list is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

● Solid Carbide

Class	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Seco	Sumitomo	Toshiba	Kennametal
P01		SRN								
P10		SRT	WS10	STi10T		S1P		ST10P	TX10S	K2885
P20		SRT DX30	EX35	STi20		SMA	S10M	ST20E	TX20 TX25	K125M
P30	PW30	SR30 DX30 DX35	EX35 EX40			SM30	S25M	A30N A30 ST30E	TX30 UX30	KMF
P40		SR30 DX35	EX45			S6	S60M	ST40E	TX40	PVA
M10		UMN UM10	WA10B		MT1	H10A	890 HX		TU10	K68 KMI K313
M20		DX25 UM20 UMS	EX35	UTi20T	KM1	H13A	883 S10M S25M	U2	TU20	K8735 KMF
M30		DX25 UM30 UMS	EX40 EX45	UTi20T	KM3	H10F	S60M	A30N A30	UX30	PVA
M40		UM40	EX45 WA40					A40	TU40	
K01		KG03	WH02 WH05	HTi05T		H1P		H2 H1	TH03	K68 K313
K10	KW10	KG10 KT9 CR1	WH10	HTi10		H1P H10 HM		EH10 EH510	G1F TH10 H10T	KMI K8735
K20		KT9 CR1 KG20	WH20	HTi20T	KM1	H13A	883 890 HX	G10E EH20 EH520	G2F G2 KS20	KMF
K30		KG30 LF12			KM3			G3	G3	
V10		D1	WH10 WH20	GTi05				D1	D10	
V20		D2	WH30	GTi10 GTi15				D2	D20 D25	
V30		D3	WH40	GTi20				D3	D30	
V40		G5 GD195	WH50	GTi30				G5	D40	
V50	VW50	MH3 MH4 GD174 GD201	WH60	GTi35 GTi40 GTi30S				G6	D50	
V60		MH5 MH7 MH8 GD206	WB60	GTi40S GTi50S				G7 G8	D60	

● Ceramic

Class	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Seco	Sumitomo	Toshiba	Kennametal
P01	SN60 **A66N**				HC1 HC4 HC5	CC650		NB90S **NB100C**	LX11 LX21	KW80 KY1615 AC5
P10					WA1	CC670		WX120	WG300	KB90 KB90X KY4000
P20										
P30										
M10					WA1	CC670 CC6080		WX120		MC3 KY2100
M20									WG300	KY2000
M30										KY3000
M40										
K01	KA30 SN60				HC1 HC2 HC5 HC6	CC620 CC650		NB90S NB90M WX120	LX11 LX21	KW80 KY1615 AC5
K10	**A66N** KS500				WA1 SX1 SP2	CC690 CC6090 **GC1690**		WX120 **NS260C**	WG300	KB90 KB90X KY3000
K20	KS500 KS6000				SX8 SP2 SX1	CC690 CC6090 **GC1690**		NS260C NS260	FX105 CX710	KY3400 KY3500
K30										

● Boldface grade shows PVD Coated Ceramic.

● CBN

Work Material	Performance	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Sumitomo	Toshiba	Kennametal
High Hard Mat'l Heat Treated Steel	↑ Wear Resistance / ↓ Toughness	KBN10B	JBN300 JBN330	W500	MB810 MB820 MB825	B20 B24	CB7020 CB20	BNX10 BNX20 BNX25 BN250	BX310 BX330	KD050 KD081
		KBN25B	JBN300 JBN330	W600 W650	MB810 MB825 MB835	B24	CB7050 CB50	BNX10 BNX25 BN250 BN300	BX330 BX360	KD050 KD081
		KBN900		W650	MB730		CB7050 CB50	BN300 BN600	BX380 BX950	KD200
Cast Iron	↑ Wear Resistance / ↓ Toughness	KBN65B	JBN500	W600 W700	MB710 MB730	B20 B22	CB7050 CB50	BN500 BN600	BX850 BX930 BX950	KD120
		KBN900	JBN500	W700	MB730	B22	CB50	BN600	BX950	KD200

● Boldface grade shows PVD Coated CBN.

● Diamond

Work Material	Performance	Kyocera	Dijet	Hitachi	Mitsubishi	NTK	Sandvik	Sumitomo	Toshiba	Kennametal
Non-ferrous Metal (Aluminium/Brass) Glass Fiber Plastics	↑ Wear Resistance / ↓ Sharp Edging	KPD025	JDA10		MD205			DA90	DX180 DX160	KD105
		KPD010	JDA200 JDA400		MD220		CD10	DA150 DA2200	DX140	KD100
		KPD005	JDA420		MD230			DA200 DA2200	DA120	
		KPD001						DA2200		

Chipbreakers Cross Reference List

● Note: This list is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Cutting Range		Kyocera			Dijet	Hitachi	Kennametal	Mitsubishi	Sandvik	NTK	Seco	Sumitomo	Toshiba
		Basic	Sub	Soft Steel									
General Steel	small a*p*	**CF**			-	-	-	-	-	-	-	-	-
	Finishing	**GP**	**DP**	**XP**	F1 FA FT	FE	MG-UF	F FH FS	QF PF	WM ZF1	FF1	SU FP SP FA	TF 01 AS
	Finishing - Medium	**CQ**	**HQ**	**XQ**	UA UT	CE B BE	MG-LF MP-K	SH C SA MV	QM	WV WR	MF2	GU SK UU SJ UJ SX EX	TS NS NM CB (11 17 27)
	Finishing-Medium (With Wiper Edge)	**WQ**					FW MW	SW MW	WF WM		W-MF2 W-M3	GUW	ASW
	Medium - Roughing	**GS CS**	**HS**	**XS**	UR UB	AE DE	MG-K	MA MH	SM PM	Z5 ZW1	M3 MF3	UG UA	TM DM
	Medium - Roughing (High Feed)	**GT**	**HT**		GC	AR RE	MG-P	GH	MR	GS	M5 MR5	UX MU	TH (32Y 32 37)
	Roughing	Conven-tional Molded			GG LG GQ	V Y	MG	HV MT	23	G	MR7	MU MX MC UZ	31 33 F-K
	Roughing (Single Sided/ High Feed)		**HX**		GS RM UC UP	H HX UE HE	MM-MR MP MM	HA HH	QR PR HR	-	R4 R6	HG MP HP	TU 57 65
Stainless Steel	Finishing	**GU**			SF	-	-	FS SH	MF	-	-	SU	SS
	Medium - Roughing	**SU**			GP	SE		MS MA ES MH GH	MM MR	-	MF1 MF3 A3 A5	EX UP	SM SA S
Cast Iron	Medium	Conven-tional Molded							KF KM	-			33
	Roughing	**ZS**	**GC**		-	-	-	-	KR	-	-	MC	
Non-ferrous Metal	Medium - Roughing	**AH**			ALU ACB	-	-	-	AL	-	95	AG	P

Milling Inserts Cross Reference List

● Note: This list is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Kyocera	Class	Application	Hitachi	Mitsubishi	Sandvik	Sumitomo	Toshiba
SDMR1203AUER-H **SDKR1203AUEN-S**	M K	Steel	SDKR1203AETN	SDNR1203AEEN-JS		SDMR1203AEEN SDMR1203AETN	SDMR1203AETN-MJ SDKR1203AESR-MJ SDKR1203AETN-MJ
SDCN1203AUTN	C		SDCN1203AETN-C9				SDCN1203AETN-12
SDKN1203AUTN	K		SDKN1203AETN-C9	SDKN1203AEN		SDKN42MT	SDKN1203AETN-12
SDKN1203AUFN	K	Cast Iron	SDKN1203AEFN-C9			SDKN42M	SDKN1203AEFN-12
SDCN1504AUTN	C	Steel	SDCN1504AETN-C9				SDCN1504AETN
SDKN1504AUTN	K		SDKN1504AETN-C9	SDKN1504AEN		SDKN53MT	SDKN1504AETN
SEMR1203AFER-H **SEKR1203AFEN-S**	M K	Steel	SEKR1203AFTN	SEER1203AFEN-JS	SEER1203AZ-WL SEKR1203AZ-WM	SEMR1203AFEN SEER1203AFEN	SEMR1203AFTN-MJ SEKR1203AFSR-MJ SEKR1203AFTN-MJ
SEMR1204AFER-H	M				SEER1204AZ-WL SEKR1204AZ-WM	SEMR1204AFEN SEER1204AFEN	
SEEN1203AFTN	E		SEEN1203AFTN-C9	SEEN1203AFTN1		SEEN42MT	
SEKN1203AFTN	K		SEKN1203AFTN-C9	SEKN1203AFTN1	SEKN1203AZ SEMN1203AZ	SEKN42MT (SENN1203AFTN)	SEKN1203AFTN
SEKN1203AFFN	K	Cast Iron	SEKN1203AFFN-C9	(SEEN1203AFFN1)	SEKN1203AZ SEMN1203AZ	SEKN42M (SENN1203AFEN)	SEKN1203AFFN
SEKN1203EFTR	K	Steel	SEKN1203EFTR-G3	SEKN1203EFTR1	(SECN1203EER)		SEKN1203EFTR
SPMR1203EDER-H **SPKR1203EDER-S**	M K	Steel		SPER1203EDER-JS	SPKR1203EDR-WH		SPKR1203EDSR-MJ
SPCN1203EDTR	C				SPAN1203EDR	SPCH42TR-R	SPCN1203EDTR
SPKN1203EDTR	K		SPKN1203EDTR-A3	SPKN1203EDR	SPKN1203EDR	(SPCH42TR-R)	SPKN1203EDTR
SPKN1203EDFR	K	Cast Iron	SPKN1203EDFR-A3		SPKN1203EDR	(SPCH42R)	SPKN1203EDFR
SPKN1504EDTR	K	Steel	SPKN1504EDTR-A3	SPKN1504EDR	SPKN1504EDR	(SPCH53TR-R)	SPKN1504EDTR
SPKN1504EDFR	K	Cast Iron	SPKN1504EDFR-A3			(SPCH53R-R)	SPKN1504EDFR
SPCN1203XPTR	C	Steel	SPCN1203YPTR-A5				SPCN1203ZPTR
SPKN1203XPTR	K		SPKN1203YPTR-A5				SPKN1203ZPTR
SPKN1203XPFR	K	Cast Iron	SPKN1203YPFR-A5				SPKN1203ZPFR
SPCN1203XDTR	C	Steel		SPC42C2SR			
SPKN1203XDTR	K			SPK42C2SR			
SPKN1504XETR	K	Steel		SPK53C2SR			
TPMR1603PDER-H	M	Steel		TPER1603PPER-JS	TPKR1603PPR-WH		
TPKN1603PDTR	K		TPKN1603PPTR-E0	TPKN1603PPR	TPKN1603PPR	TPKN32TR	
TPKN1603PDFR	K	Cast Iron	TPKN1603PPFR-E0		TPKN1603PPR	TPKN32R	
TPMR2204PDER-H **TPKR2204PDER-S**	M K	Steel		TPER2204PDER-JS	TPKR2204PDR-WH		TPMR2204PDSR-MJ TPKR2204PDSR-MJ
TPKN2204PDTR	K		TPKN2204PDTR-E0	TPKN2204PDR	TPKN2204PDR	(TPCH43TR)	TPKN2204PPTR
TPKN2204PDFR	K	Cast Iron	TPKN2204PDFR-E0		TPKN2204PDR	(TPCH43R)	TPKN2204PPFR
TEMR1603PTER-H	M	Steel		TEER1603PEER-JS			
TEKN1603PTTR	K		TEKN1603PETR-G0	(TEEN1603PETR1)		TEKN32TR	(TEEN1603PETR)
TEKN1603PTFR	K	Cast Iron	TEKN1603PEFR-G0	(TEEN1603PEFR1)		TEKN32R	(TEEN1603PEFR)
TEMR2204PTER-H **TEKR2204PTER-S**	M K	Steel		TEER2204PEER-JS			
TEEN2204PTTR	E		TEEN2204PETR-G0E	TEEN2204PETR1		TEEN43TR	TEEN2204PETR
TEKN2204PTTR	K		TEK2204PETR-G0E	TEKN2204PETR1		TEKN43TR	(TEEN2204PETR)
TEKN2204PTFR	K	Cast Iron	TEK2204PEFR-G0E	(TEEN2204PEFR1)		TEKN43R	(TEEN2204PEFR)
SNCN1204XNTN	C	Steel	SNCN1204YNTN-D5	SNC43B2S		(CSN43MT)	SNCN1204ZNTN
SNKN1204XNTN	K		SNKN1204YNTN-D5	SNK43B2S		(CSN43MT)	SNKN1204ZNTN
SNMF1204XNTN	M	Steel	(SNKF1204YNTN-D5)	(SNKF43B2S)		(CSNB43MT)	(SNKF1204ZNTN)

CERATIP® Property Table

Cermet

Grade	Color	Major Ingredient	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
TN6020	Gray	TiCN	–	6.4	1500	14.7	10.0	2500
TN30	Gray	TiCN+NbC	–	6.2	1800	17.6	6.0	1270
TN60	Gray	TiCN+NbC	–	6.6	1600	15.7	9.0	1760
TN90	Gray	TiCN+NbC	–	6.4	1450	14.2	10.0	1960
TN100M	Gray	TiCN+NbC	–	6.7	1520	14.9	10.5	1860
N	Gray	TiC+TiN	–	6.0	1650	16.2	8.5	1470
TC40N	Gray	TiC+TiN	–	6.0	1650	16.2	9.0	1570
TC60M	Gray	NbC	–	8.1	1500	14.7	10.5	1670

PVD Cermet

Grade	Color	Coat Film	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
PV7020	Gold	TiAlN+TiN	Thin	6.4	1500	14.7	10.0	2500
PV30	Gold	TiN	Thin	6.2	1800	17.6	6.0	1270
PV60	Gold	TiN	Thin	6.6	1600	15.7	9.0	1760
PV90	Gold	TiN	Thin	6.4	1450	14.2	10.0	1960

CVD Coated Carbide

Grade	Color	Coat Film	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
CA4010	Gold	Columnar TiCN+Al_2O_3+TiN	Thick	14.8	1670	16.4	10.0	3000
CA5025	Gold	Columnar TiCN+Al_2O_3+TiN	Thick	14.2	1480	14.5	13.0	2270
CA6015	Gold	Columnar TiCN+Al_2O_3+TiN	Thick	14.7	1530	15	12.0	2780
CR7015	Gold	Columnar TiCN+Al_2O_3+TiN	Thick	14.7	1550	15.2	12.0	2750
CR7025	Gold	Columnar TiCN+Al_2O_3+TiN	Thick	14.5	1400	13.7	12.0	2780
CR9025	Gold	Columnar TiCN+TiN	Thick	14.5	1400	13.7	12.0	2780
CA225	Gray Black	TiC+Al_2O_3	Thick	13.9	1350	13.2	12.0	1570

PVD Coated Carbide

Grade	Color	Coat Film	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
PR510	Gold	TiCN+TiN	Thin	15.0	1650	16.2	10.0	1470
PR610	Gold	TiN	Thin	15.0	1650	16.2	10.0	1470
PR630	Gold	TiN	Thin	12.5	1500	14.7	11.0	2160
PR660	Gold	TiN	Thin	13.7	1450	14.2	12.0	2250
PR730	Gold	TiAlN+TiN	Thin	13.7	1450	14.2	12.0	2250
PR830	Gold	TiAlN+TiN	Thin	13.7	1450	14.2	12.0	2250
PR905	Bluish Purple	TiAlN	Thin	14.8	1670	16.4	10.0	3000
PR915	Bluish Purple	TiAlN	Thin	14.1	1700	16.7	11.0	4140
PR930	Grayish Red	TiCN	Thin	14.1	1700	16.7	11.0	4140

Carbide

Grade	Color	Major Ingredient	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
PW30	Gray	WC+Co+TiC+TaC	–	12.5	1500	14.7	12.0	2160
KW10	Gray	WC+Co	–	15.0	1650	16.2	10.0	1470

Ceramic

Grade	Color	Major Ingredient	Film Thickness	Sp.Gr.	Hardness (HV)	Hardness (GPa)	Fracture Toughness ($MPam^{1/2}$)	Bending Strength (MPa)
KA30	Light White	Al_2O_3	–	4.0	1790	17.5	4.0	750
SN60	White	Al_2O_3+ZrO_2	–	4.0	1700	16.7	4.0	590
A65	Black	Al_2O_3+TiC	–	4.2	2100	20.6	4.5	780
A66N	Gold	Al_2O_3+TiC+TiN Coat	Thin	4.2	2000	19.6	6.5	980
KS500	Gray	Si_3N_4	–	3.9	1630	16.0	6.5	900
KS6000	Gray	Si_3N_4	–	3.9	1600	15.7	6.5	1230

Index

509～527

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description	Page	Name
CPGB ○○○○○○ME-T	446	Insert (Turning) "Multi Edge"
CPGB ○○○○○○SE	446	Insert (Turning) "Small Edge"
CPGB ○○○○○○SE-T	446	Insert (Turning) "Small Edge"
CPMB ○○○○○○	59	Insert (Turning)
CPMH ○○○○○○	57,460	Insert (Turning)
CPMH ○○○○○○HQ	57	Insert (Turning)
CPMH ○○○○○○R/L-F12	58	Insert (Turning)
CPMH ○○○○○○R/L-Y	58	Insert (Turning)
CPMT ○○○○○○GP	57	Insert (Turning)
CPMT ○○○○○○XP	58	Insert (Turning)
CPMT ○○○○○○XQ	58	Insert (Turning)
CP-RCR/L	107,196,481	Spare Parts (Clamp)
CPS-1	179,482	Spare Parts (Clamp Set)
CPS-2	179,187,482	Spare Parts (Clamp Set)
CPS-2P	133,143,144, 482	Spare Parts (Clamp Set)
CPS-2S	389,482	Spare Parts (Clamp Set)
CPS-2TR	387,482	Spare Parts (Clamp Set)
CPS-3	133,143,144, 179,187,482	Spare Parts (Clamp Set)
CPS-4V	233,482	Spare Parts (Clamp Set)
CPS-5E	389,482	Spare Parts (Clamp Set)
CPS-5F	233,438,482	Spare Parts (Clamp Set)
CPS-5R/L	101,482	Spare Parts (Clamp Set)
CPS-5S	290,296,482	Spare Parts (Clamp Set)
CPS-5V	233,247-249, 255,482	Spare Parts (Clamp Set)
CPS-6F	438,482	Spare Parts (Clamp Set)
CPS-6M	346,348,350, 352,482	Spare Parts (Clamp Set)
CPS-6S	290,296,482	Spare Parts (Clamp Set)
CPS-6V	233,249,251, 252,255,440, 482	Spare Parts (Clamp Set)
CPS-8V	249,251,252, 482	Spare Parts (Clamp Set)
CRDNN ○○○○□-○○	114	Toolholder (Turning)
CRDNN ○○○○□-○○A	455	Toolholder (Turning)
CRSNR/L ○○○○□-○○	114	Toolholder (Turning)
CRSNR/L ○○○○□-○○A	455	Toolholder (Turning)
CSBPR/L ○○○○□-○○N	143	Toolholder (Turning) "Small Tools"
CSDNN ○○○○□-○○	113	Toolholder (Turning)
CSDNN ○○○○□-○○A	453	Toolholder (Turning)
CSDPN ○○○○□-○○N	144	Toolholder (Turning) "Small Tools"
CSKNR/L ○○○○□-○○	112	Toolholder (Turning)
CSKNR/L ○○○○□-○○A	453	Toolholder (Turning)
CSKNR/L ○○○○B-○○	198	Boring Bar (Steel Bar)
CSKNR/L ○○○○B-○○A	457	Boring Bar (Steel Bar)
CSKPR/L ○○○○□-○○N	143	Toolholder (Turning) "Small Tools"
CSKPR/L ○○○○B-○○	187	Boring Bar (Steel Bar)
CS-NR/L ○○○○□-○○	112	Toolholder (Turning)

Description	Page	Name
CSRNR/L ○○○○□-○○	112	Toolholder (Turning)
CSRNR/L ○○○○□-○○A	453	Toolholder (Turning)
CSSNR/L ○○○○□-○○	112	Toolholder (Turning)
CSSNR/L ○○○○□-○○A	454	Toolholder (Turning)
CSSPR/L ○○○○□-○○N	144	Toolholder (Turning) "Small Tools"
CSYNR/L ○○○○□-○○	112	Toolholder (Turning)
CSYNR/L ○○○○□-○○A	453	Toolholder (Turning)
CTFPR/L ○○○○□-○○N	133	Toolholder (Turning) "Small Tools"
CTGPR/L ○○○○□-○○N	133	Toolholder (Turning) "Small Tools"
CTJNR/L ○○○○□-○○	109	Toolholder (Turning)
CTJNR/L ○○○○□-○○A	452	Toolholder (Turning)
CTTPR/L ○○○○□-○○N	133	Toolholder (Turning) "Small Tools"
CTUCR/L ○○○○B-○○	197	Boring Bar (Steel Bar)
CTUNR/L ○○○○□-○○	109	Toolholder (Turning)
CTUNR/L ○○○○□-○○A	452	Toolholder (Turning)
CTUNR/L ○○○○B-○○A	457	Boring Bar (Steel Bar)
CTUPR/L ○○○○B-○○	179	Boring Bar (Steel Bar)

D

DCET ○○○○○○R/L-FSF	70	Insert (Turning) "Super Fine"
DCET ○○○○○○FR/L-JSF	71	Insert (Turning) "Super Fine"
DCET ○○○○○○FR/L-USF	71	Insert (Turning) "Super Fine"
DCGT ○○○○○○	70	Insert (Turning)
DCGT ○○○○○○AH	70,(21)	Insert (Turning)
DCGT ○○○○○○CF	70,(19)	Insert (Turning)
DCGT ○○○○○○EN-Z	71	Insert (Turning)
DCGT ○○○○○○ER/L-J	71	Insert (Turning)
DCGT ○○○○○○ER/L-U	71	Insert (Turning)
DCGT ○○○○○○FN-Z	71	Insert (Turning)
DCGT ○○○○○○FR/L-J	71	Insert (Turning)
DCGT ○○○○○○FR/L-U	71	Insert (Turning)
DCGT ○○○○○○R/L-A3	72	Insert (Turning)
DCGT ○○○○○○R/L-F	70	Insert (Turning)
DCGT ○○○○○○R/L-FS	70	Insert (Turning)
DCGW ○○○○○○	72	Insert (Turning)
DCMT ○○○○○○	70,460	Insert (Turning)
DCMT ○○○○○○GK	70	Insert (Turning)
DCMT ○○○○○○GP	70	Insert (Turning)
DCMT ○○○○○○HF	70	Insert (Turning)
DCMT ○○○○○○HQ	70	Insert (Turning)
DCMT ○○○○○○XP	70	Insert (Turning)
DCMT ○○○○○○XQ	70	Insert (Turning)
DCMW ○○○○○○	449	Insert (Turning)
DCMW ○○○○○○ME-T	449	Insert (Turning) "Multi Edge"
DCMW ○○○○○○S2E	448	Insert (Turning) "Small Edge"
DCMW ○○○○○○SE	448	Insert (Turning) "Small Edge"
DCMW ○○○○○○SE-T	448	Insert (Turning) "Small Edge"
DCMW ○○○○○○SE-T○○○○○	448	Insert (Turning) "Small Edge"
DMC ○○○	386	Endmill
DMC ○○○H	388	Endmill
DMC ○○○-S○○	386	Endmill

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description	Page	Name
MRP ○○○R-○○E-○T	361	Face Mill (Radius) "Radius Mill"
MRP ○○○R-SC	427	Face Mill (Radius) "Radius Mill"
MRP ○○○-S○○-○○	422,(51)	Endmill (Radius) "Radius Mill"
MRP ○○○-S○○-○○○-○○	422,(51)	Endmill (Radius) "Radius Mill"
MRP ○○○-S○○-○○-○T	422,(51)	Endmill (Radius) "Radius Mill"
MRP ○○○-S○○-○○-○T-○○○	422,(51)	Endmill (Radius) "Radius Mill"
MRP ○○○-W○○-○T○○-○○○	422	Endmill (Radius) "Radius Mill"
MRZ ○○-C○○○	418	Endmill (Ball-Nose)
MRZ ○○-C○○○-○○○	418	Endmill (Ball-Nose)
MRZ ○○-MK○-○○○-H	418	Endmill (Ball-Nose)
MRZ ○○-S○○	418	Endmill (Ball-Nose)
MRZ ○○-S○○-○○○	418	Endmill (Ball-Nose)
MRZ ○○-S○○-W	418	Endmill (Ball-Nose)
MRZ ○○-S50.8-CS	418	Endmill (Ball-Nose)
MRZ ○○S-S○○	418	Endmill (Ball-Nose)
MRZ ○○S-W○○	418	Endmill (Ball-Nose)
MRZ ○○-W○○	418	Endmill (Ball-Nose)
MSD 45○○	348	Face Mill (with Shank)
MSD 45○○-32	348	Face Mill (with Shank)
MSD 45○○○R	348	Face Mill
MSD-42	348,476	Spare Parts (Shim)
MSE 15○○	352	Face Mill (with Shank)
MSE 15○○-32	352	Face Mill (with Shank)
MSE 45○○	346	Face Mill (with Shank)
MSE 45○○-32	346	Face Mill (with Shank)
MSE 45○○○R	346	Face Mill
MSE-4215	352,476	Spare Parts (Shim)
MSE-4245	346,476	Spare Parts (Shim)
MSM ○○○	359	Face Mill "Hurricane"
MSM ○○○-E	359	Face Mill "Hurricane"
MSO 45○○○R	344	Face Mill "Hurricane"
MSO 45○○○R-09	342	Face Mill "Hurricane"
MSO 45○○○R-13E-○T	344	Face Mill "Hurricane"
MSO 45○○○R-E	344	Face Mill "Hurricane"
MSO 45○○-S	344	Face Mill (with Shank) "Hurricane"
MSO 45○○-S32-09	342	Face Mill (with Shank) "Hurricane"
MSO 90○○○R-○○	356	Face Mill "Square Mill"
MSO 90○○○R-○○E-○○T	356	Face Mill "Square Mill"
MSO 90○○-S32-○○	356	Face Mill (with Shank) "Square Mill"
MSO-4T245	345,476	Spare Parts (Shim)
MSP 15○○	350	Face Mill (with Shank)
MSP 15○○○R	350	Face Mill
MSP-42	350,476	Spare Parts (Shim)
MTE 90○○	354	Face Mill (with Shank)
MTE 90○○-32	354	Face Mill (with Shank)
MTE 90○○○R	354	Face Mill
MTE-42	354,476	Spare Parts (Shim)
MTES ○○○	385	Endmill
MTP 90○○	353	Face Mill (with Shank)
MTPS ○○○	389	Endmill
MVG ○○○○	440	Endmill (Grooving for M/C)

Description	Page	Name
MVLN[R/L] ○○○○□-○○	101	Toolholder (Turning)
MVN-32	101,476	Spare Parts (Shim)
MVVNN ○○○○□-○○	101	Toolholder (Turning)

N

NDCT ○○○○○○FR	377,386,387	Insert (Milling)
NDCT ○○○○○○TR	377,386,387	Insert (Milling)
NDCT ○○○○○○TRX	377,388	Insert (Milling)
NDCW ○○○○○○FRX	377,379,388, 463	Insert (Milling)
NDCW ○○○○○○TR	377,387	Insert (Milling)
NDCW ○○○○○○TRX	377,388	Insert (Milling)
NDKT ○○○○○○ER-N○	358,376,382, 393,429	Insert (Milling)
NDKT ○○○○○○ER-V	358,376,382, 393,429	Insert (Milling)
NDKT ○○○○○○TR	358,376,382, 393	Insert (Milling)
NDKT ○○○○○○TR-V	358,376,382, 393,429	Insert (Milling)
NDKW ○○○○○○ER	358,376,382, 393,429	Insert (Milling)
NDKW ○○○○○○TR	358,376,382	Insert (Milling)
NDMM ○○○○○○ER-N○	359,376,393, 399,429	Insert (Milling)
NDMM ○○○○○○ER-SP	376,386-388	Insert (Milling)
NDMM ○○○○○○ER-T	376,393,429	Insert (Milling)
NDMT ○○○○○○ER-D	376,411,413	Insert (Milling)
NDMT ○○○○○○ER-DH	377,411,413	Insert (Milling)
NEMT ○○○○○○ER-D	376,411,413, 420	Insert (Milling)
NEMT ○○○○○○ER-DH	376,411,413, 420	Insert (Milling)

P

P-03	97,483	Spare Parts (Shim Pin)
P-03S	97,188,190, 193,194,483	Spare Parts (Shim Pin)
PC-1	95-97,99, 102-106,188, 190,194,195, 486	Spare Parts (Punch)
PC-2	95-97,99, 102-104,106, 189,191,486	Spare Parts (Punch)
PCLN[R/L] ○○○○□-○○	95	Toolholder (Turning)
PCLN[R/L] ○○○○B-○○	188,189	Boring Bar (Steel Bar)
PCLN[R/L] ○○○○B-○○H	188	Boring Bar (Steel Bar)
PDHN[R/L] ○○○○□-○○	99	Toolholder (Turning)
PDJN[R/L] ○○○○□-○○	99	Toolholder (Turning)
PDJN[R/L] ○○○○□-○○U	99	Toolholder (Turning)

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

R

S

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

V

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number

Description Index

○···Figure □···Alphabet
( ) shows Top Color Page Number