

KORLOY

Leading the Future of Limitless Machining

KORLOY'S NEW AND BEST-SELLING PRODUCTS

KORLOY's continuous technical innovations produce the highest quality cutting tools needed to lead manufacturing to the next level. Driving global innovation in all industries, including automotive, machine tool, railway, shipbuilding, die and mold, electronics and aerospace.



KORLOY NEW PRODUCTS



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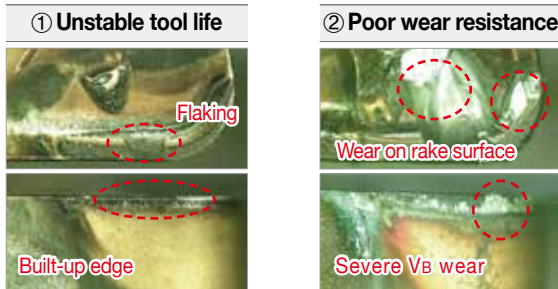
NC3215 / NC3225

New High Performance Turning in Steels

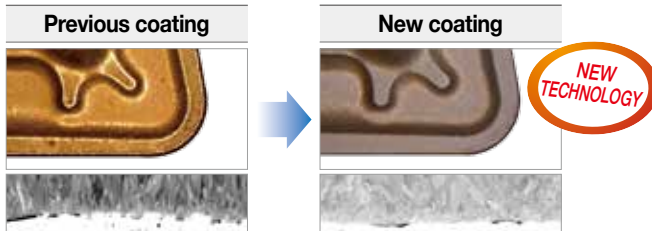
► Features

- Newly developed CVD coating for machining forged and bearing steels
- NC3215 is ideal for high speed and continuous cutting, NC3225 is the first choice as an universal grade for machining steels
- Both grades have improved wear resistance and show more stability on cutting edges

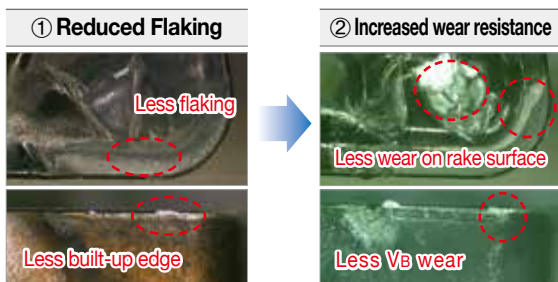
► Common Problems



► NC3215 / NC3225 Technology



► Problems Solved with New Technology



NC3215 / NC3225 are the first choices for increased productivity when machining Forged and Bearing steels. It can also be used to improve performance in other applications including carbon steels, alloy steels, hardened steels through post processing and others.

NC6315

New Advanced Turning Solution for Machining Cast Iron

▶ Features

- Expanded application range in cast irons at high speeds and feeds and in interrupted cutting
- New CVD coating increases resistance to both wear and chipping
- The perfect combination of new technologies provides advanced solutions for preventing excessive rake & flank wear, edge chipping and burr creation

▶ Features of MK Chip Breaker for medium cutting

Angle land

- The applied angle lands improve sharp cutting performance
- Excellent wear resistance in continuous cutting
- High quality surface finishes

Wide supporting area

- Higher clamping stability
- Prevents chipping at vibrations during operation



▶ Features of RK Chip Breaker for roughing

Flat land

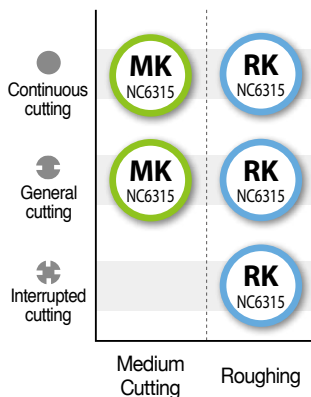
- The flat lands provide a significant increase in toughness to prevent chipping
- Machining stability is improved even under high cutting loads, deep depths of cut, or interrupted cuts
- Optimized land width for high feed machining

Wide supporting area

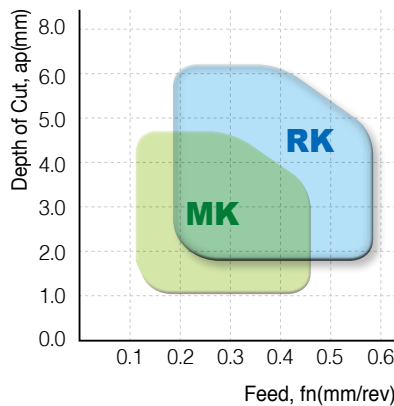
- Higher clamping stability
- Prevents chipping at vibrations during operation



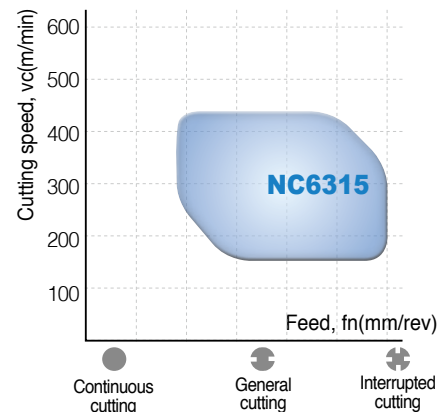
▶ Application Range



▶ Recommended Cutting Range



▶ Grade Lineup



NC9115 / NC9125

NC9135 Optimized Machining Performance in Stainless Steels

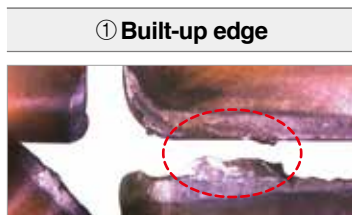
▶ Features

- Optimized combination of substrate and coating provide extended tool life at high speeds, feeds and deep depths of cut
- Grade lineup availability supports most application requirements
- New applied technologies prevent built-up edge, notch wear, plastic deformation and burr creation

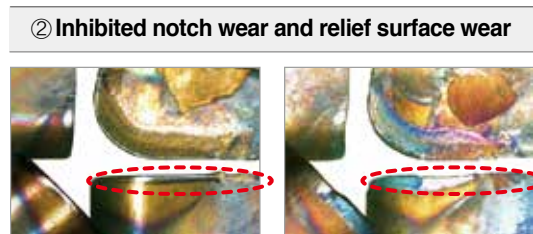
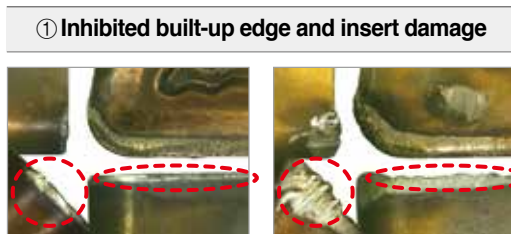


▶ Common Problems

- Sheared chips impact cutting edges repeatedly and cause damage on cutting edges
- Difficult to break chips lead to built-up edge, work hardening and increased notch wear



▶ Problems Solved with New Technology



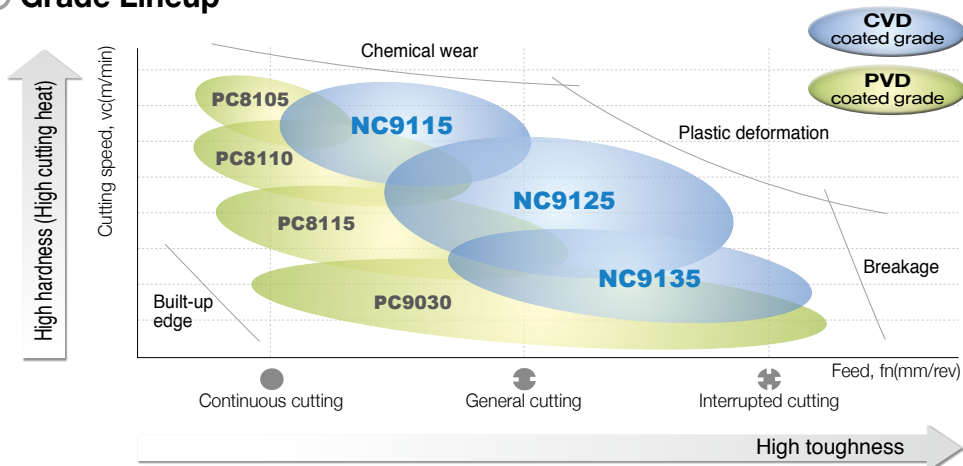
[NC9125 (M25)]

[Competitor (M25)]

[NC9135 (M35)]

[Competitor (M35)]

▶ Grade Lineup

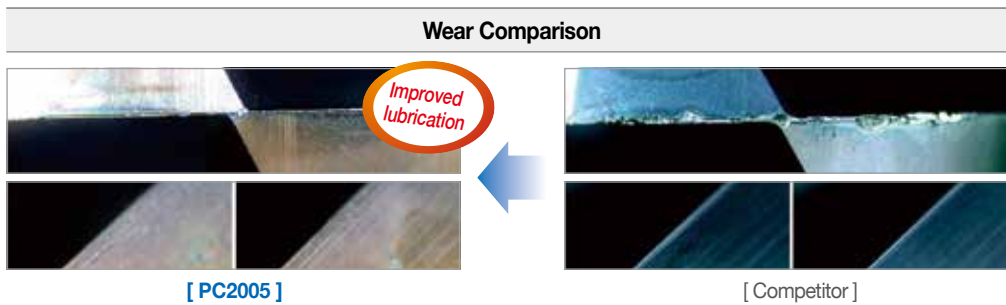


PC2005 / PC2010 PC2015

Insert Series for Finishing High Hardness Steel

▶ **PC2005 → For High Hardness Steel and Press Die Steel**

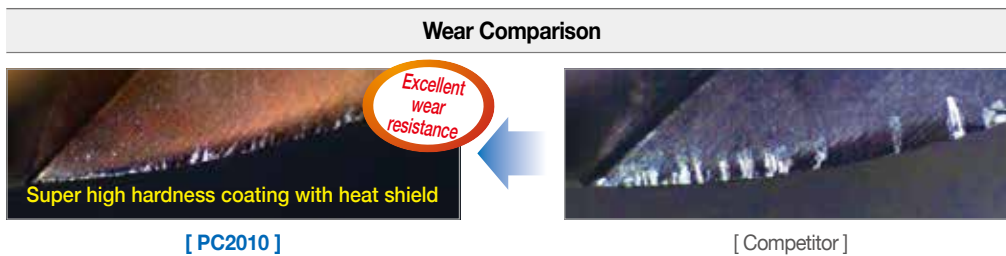
- Super high hardness substrate and coating film dramatically improve wear resistance



- High hardness substrate reduces chipping and wear on relief surface

▶ **PC2010 → For Pre-Hardened Steel and Plastic Die Steel**

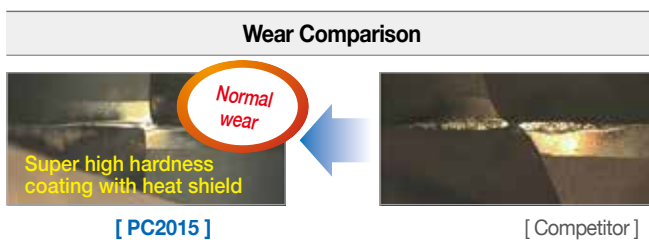
- Tough grade with ultra fine WC and high binder to extend application area from high hardness steel to pre-hardened steel



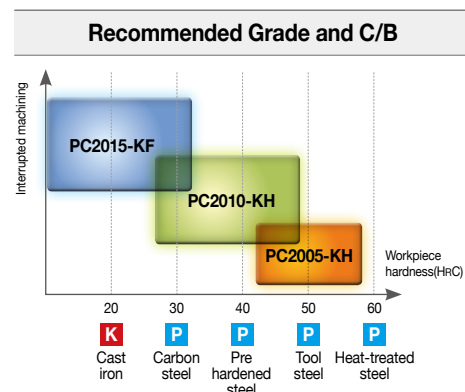
- Heat shield coating was applied to prevent thermal crack
- Ultra fine WC was combined with high contents cobalt to be optimized for machining pre hardened steel

▶ **PC2015 → For Carbon Steel and Cast Iron**

- High toughness substrate based grade for general cutting of cast iron and HRSA with the use of lubricative coating layer



- High toughness substrate and coating layer improve welding resistance with the workpiece
- Excellent tool life due to minimized wear and flaking



PC2505 / PC2510

Roughing Grade Series for High Hardened steel



► Features

- Ideally suited for high hardened steel, tool steel and pre-hardened steel
- Higher productivity and more stable tool life in high feed and high hardness applications when used in a matching high feed cutter

PC2505

- For machining ultra high hardness workpieces
- Excellent wear resistance helps to extend tool life when machining pressed die steel and heat treated steels of high hardness over HRC45



For high hardened steel (Over HRC 45)

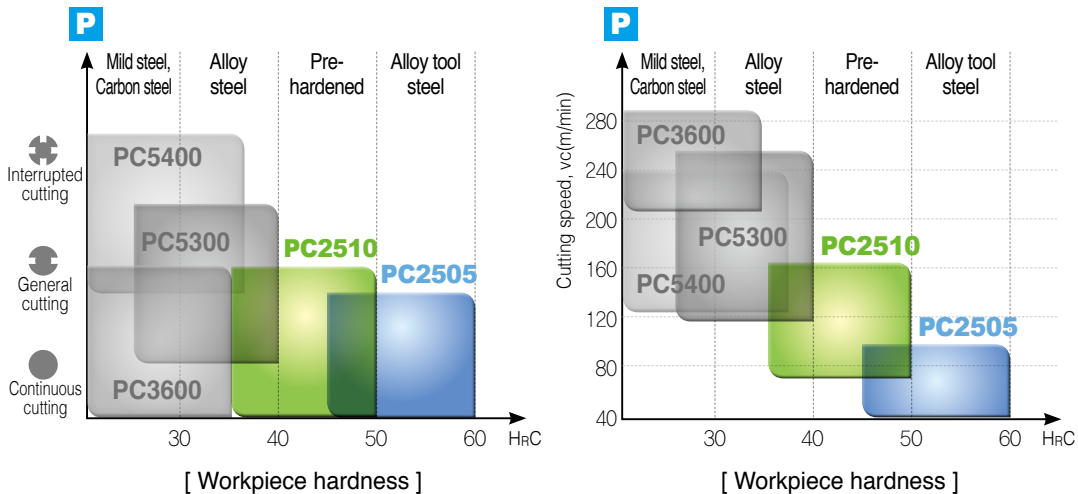
PC2510

- For high hardened steel and pre hardened steel
- High toughness ultrafine substrate ideal for interrupted cutting of high hardened steel and wet cutting with massive thermal shock



For high hardened steel and pre hardened steel (For HRC 35-50)

► Application Guideline



PC8105 / PC8110 PC8115

First Choice for Turning HRSA and Stainless Steels

► Features

PC8105

- Ultra fine substrate for higher wear and chipping resistance
- Excellent PVD coated technology with high hardness and oxidation resistance at high temperature
- Extended tool life in high speed machining and finishing of heat-resistant alloy and stainless steel

PC8110

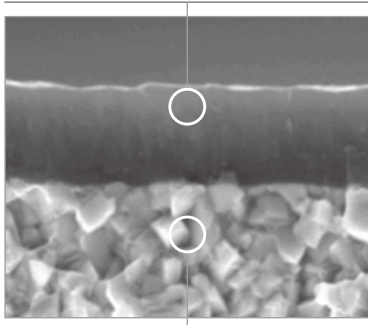
- Substrate with excellent wear resistance and plastic deformation resistance at super high temperature
- Excellent PVD coated technology with high hardness and oxidation resistance at high temperature
- Extended tool life in high speed machining of heat-resistant alloy and stainless steel

PC8115

- Ultra fine grain matrix for improving wear and chipping resistance
- Excellent PVD coated technology with high hardness and oxidation resistance at high temperature
- Stable machining with its strong cutting edges and excellent chipping resistance
- Extended tool life in medium low speed machining and medium roughing of heat-resistant alloy and stainless steel

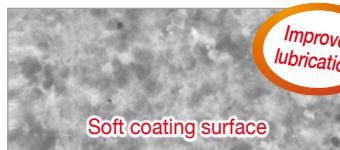
► Development of PC8100 Series

Tool life is improved significantly at high temperatures by the application of a new coating film with excellent surface finish, high hardness and superior oxidation resistance



This new coating film with its submicron matrix equalizes with the substrate to improve stability between corners, and increases chipping and wear resistance

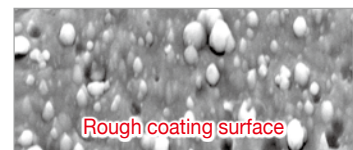
Coating Surface Treatment Technology (Pictures of coating layer)



Soft coating surface

[PC8100 Series]

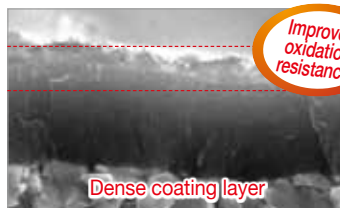
Improved lubrication



Rough coating surface

[Conventional coating]

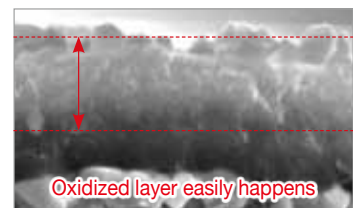
Oxidation Resistant Coating Technology (Pictures of coating layer heat-treated at 900°C)



Dense coating layer

[PC8100 Series]

Improved oxidation resistance



Oxidized layer easily happens

[Competitor]

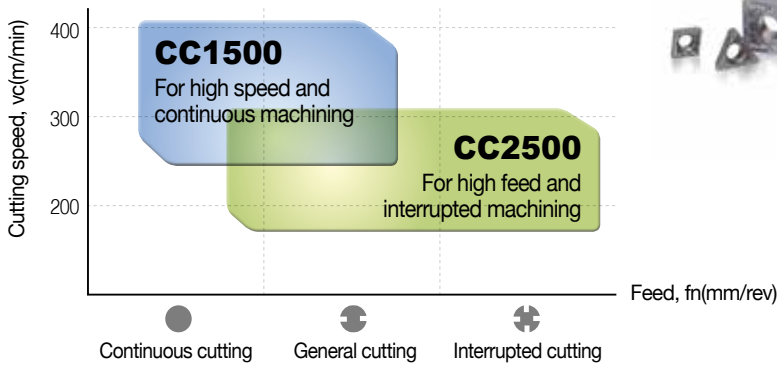
CC1500 / CC2500

Coated Cermet Solution for High Speed Steel Turning

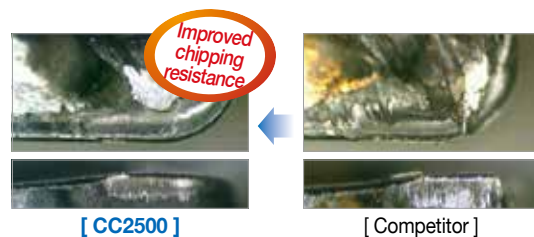
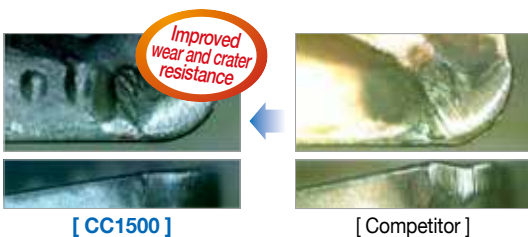
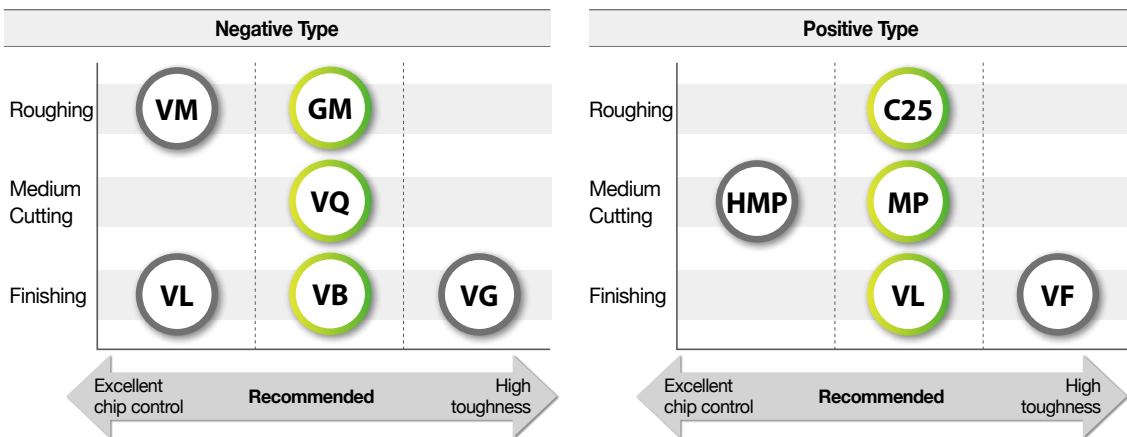
► Features

- The next generation cermet grades with higher wear and chipping resistance in high speed machining
- Improved performance in finishing & continuous machining of hot/cold forged steel and sintered ferrous alloy
- Optimized cutting edge to improve surface finish

► Grade Lineup



► Chip Breaker Lineup



CN1500 / CN2500

Cermet Solution for High Speed Steel Turning

► Features

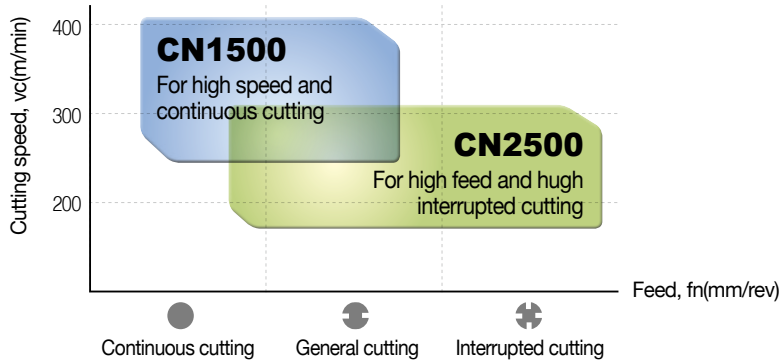
CN1500 - For High Speed and Continuous Cutting

- Improved performance in finishing & continuous machining of hot/cold forged steel and sintered ferrous alloy
- Excellent wear resistance and crater resistance
- Optimized cutting edge to improve surface finish

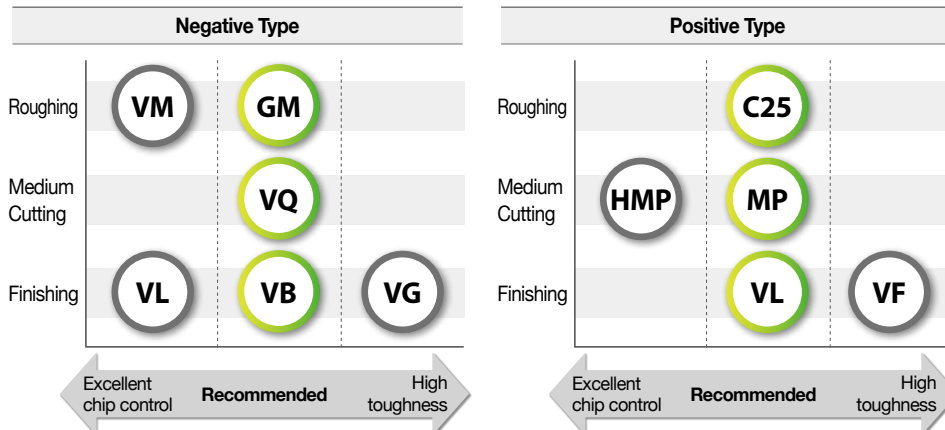
CN2500 - For High Feed and Interrupted Cutting

- Improved performance in high feed and high interrupted machining of hot/cold forged steel and sintered ferrous alloy
- Excellent anti-chipping, anti-fracture and thermal crack resistance
- Optimized cutting edge to improve surface finish

► Grade Lineup



► Chip Breaker Lineup



MP/LP Chip Breaker

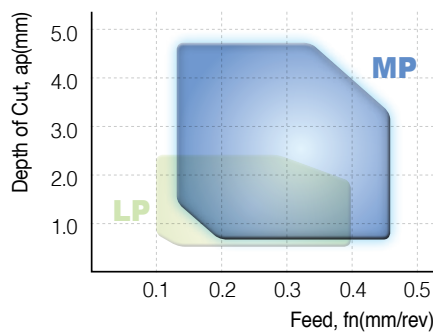
New High Productivity Chipbreakers Developed for Machining Steels

Features

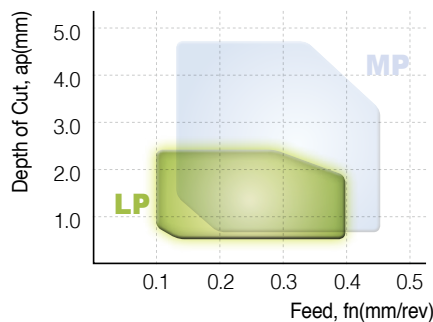
- Chip breaker for forged steel of automobile parts and general steels
- Quad dots improve productivity through efficient chip control at high feed and various depth of cut
- Stable chip control increases productivity in various machining
- Stable Tool life at high speed and high feed machining thanks to reduced cutting force by applied variable land



MP Chip Breaker (For medium cutting)



LP Chip Breaker (For medium cutting to Finishing)



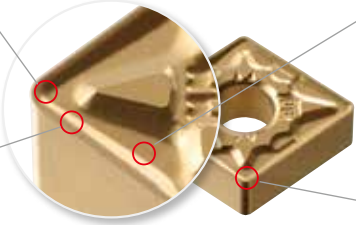
MM / RM Chip Breaker

Chipbreakers for Machining Stainless Steel

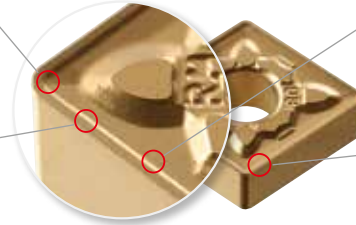
▶ Features

- Extended tool life at high speeds, feeds and depths of cut
- A wide grade lineup for most workpiece sizes and types, including heavy interruption
- Solutions for Stainless Steel Machining for prevents built-up edge, notch wear, plastic deformation and burr creation

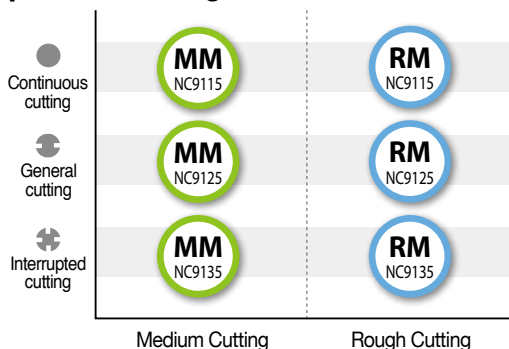
▶ MM Chip Breaker (For medium cutting)

<div data-bbox="252 837 571 1003"> <p>Variable Land</p> <ul style="list-style-type: none"> • Excellent chip control and sharp cutting at low depths of cut • Delays crater wear • Prevents plastic deformation </div>		<div data-bbox="1059 837 1401 1084"> <p>Wide Chip Pocket</p> <ul style="list-style-type: none"> • Stable chip evacuation at high speeds/feeds • Improved surface finishes by reduced workpiece scratches caused by work-hardened chips at high depths of cut • Prevents built-up edge </div>
<div data-bbox="252 1030 571 1245"> <p>Dual Land</p> <ul style="list-style-type: none"> • Balance between requirements of sharp and tough cutting edges • Sharp cutting edge for high speed machining • Prevents chipping in interrupted machining </div>		<div data-bbox="1059 1088 1401 1254"> <p>100° Corner</p> <ul style="list-style-type: none"> • 100° corner angle is recommended for roughing outer diameters and preventing burrs • Reduced cutting load for high feed machining </div>

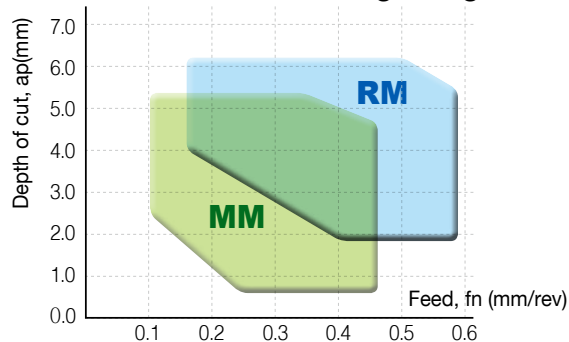
▶ RM Chip Breaker (For Roughing)

<div data-bbox="252 1317 571 1473"> <p>Variable Land</p> <ul style="list-style-type: none"> • Excellent chip control and sharp cutting at low depths of cut • Delays crater wear • Prevents plastic deformation </div>		<div data-bbox="1059 1317 1401 1482"> <p>Stepped Design</p> <ul style="list-style-type: none"> • Stepped design makes chip evacuation easier • Smooth chip evacuation prevents plastic deformation </div>
<div data-bbox="252 1487 571 1641"> <p>Wide Land & Gentle Front Angle</p> <ul style="list-style-type: none"> • Sharp cutting edges and wide land reduce cutting force • Reduced burrs • Dispersed cutting load enables higher toughness </div>		<div data-bbox="1059 1487 1401 1641"> <p>Low Cutting Force at 100° corner</p> <ul style="list-style-type: none"> • 100° corner angle is recommended for roughing outer diameters and preventing notch wear • Stepped design reduces cutting load </div>

▶ Application Range



▶ Recommended Cutting Range



KGT

Next Generation Multi-Functional Machining System with Strong Clamping

► Features

- KGT holders provide a total tooling solution with a wide selection for external / internal diameter machining, parting off, copying and relief machining
- KGT chip breakers are ready for various workpieces and a wide application area with its characteristics of excellent chip evacuation for quality surface finish and high precision

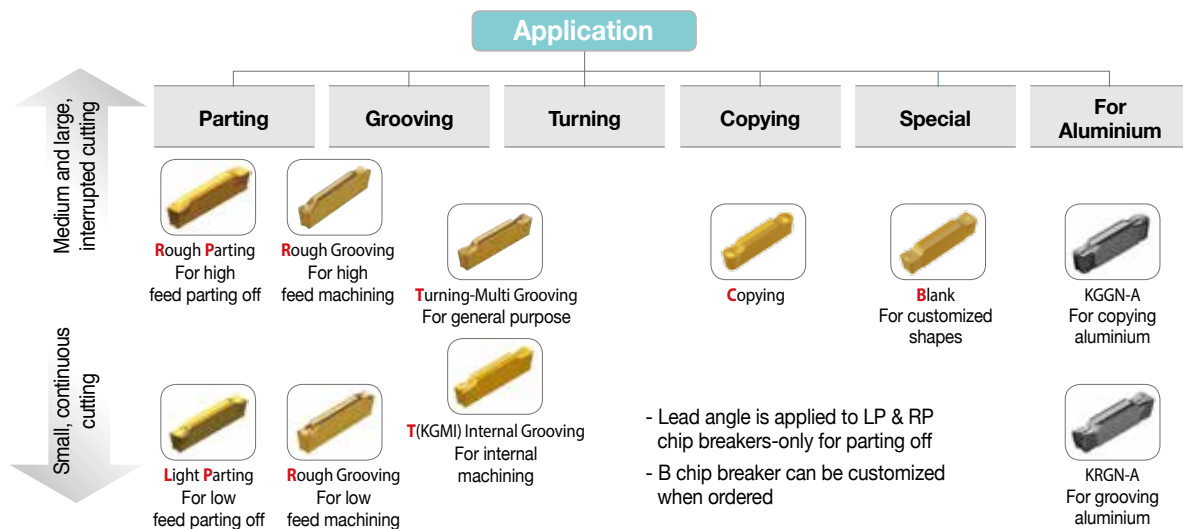
Top side(Insert)



- Strong clamping ⇒ Higher stability
- Self-centering ⇒ Higher accuracy
- Anti-chattering design ⇒ Fine surface finish



► KGT Lineup

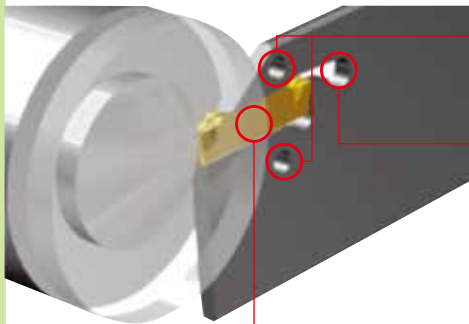


KGT Blade

Next Generation Solution for Deep Grooving and Parting Off Machining

▶ Features

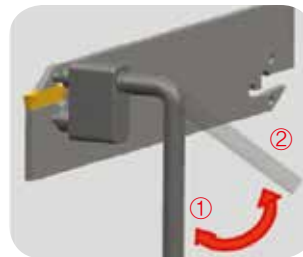
- Parting application with the use of KGT inserts
- Specially designed slot for strong and stable clamping
- Easy change of insert with the use of exclusive wrench



Wrench clamping area
Easy change of insert

Specially designed slot
Strong clamping and durability

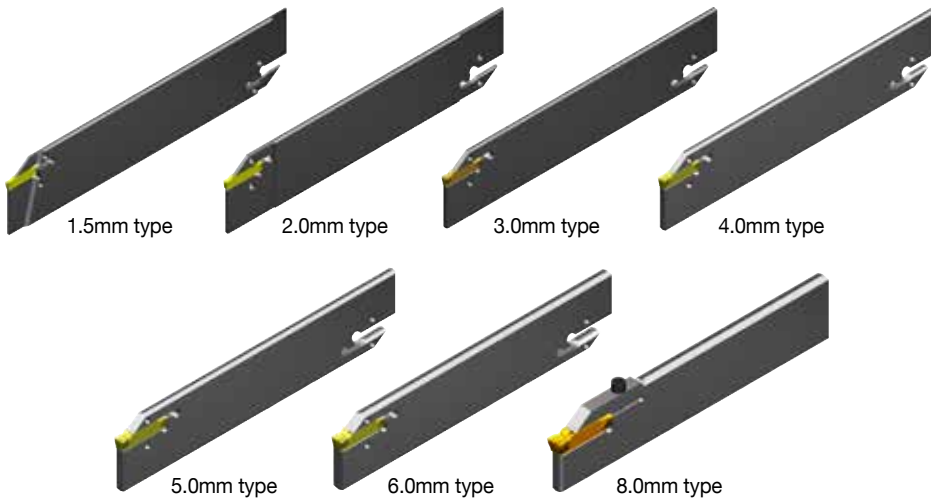
KGT clamping system
Higher stability



① ⇒ ② Rotation : Release
② ⇒ ① Rotation : Clamp

▶ Blade Lineup

- Range of cutting edge width : 1.5 ~ 8.0mm



1.5mm type

2.0mm type

3.0mm type

4.0mm type

5.0mm type

6.0mm type

8.0mm type

AUTO Tools

Turning Insert for Automatic Lathes



▶ Features

- The harmony between a fine grain grade and sharp cutting edges increases tool life
- Recommended for automated operation and mass production
- High class tolerance enables stable machining

▶ E Class Tolerance (KF/KM type) – Fully Ground high precision Insert

KF type



For finishing

- Sharp edges for low cutting load
- Smooth chip flow and excellent surface finish when finishing

KM type



For medium to finishing

- Wide chip pocket for wide range machining
- Improved chip flow for longer tool life and cutting performance

▶ G Class Tolerance (VP1 type)

VP1 type

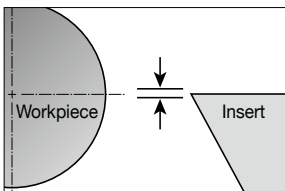


For medium to finishing

- Three dimensional C/B for stable chip control
- Sharp edges for low cutting load and heat

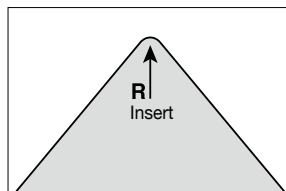
▶ Insert Tolerance

Precise tolerance



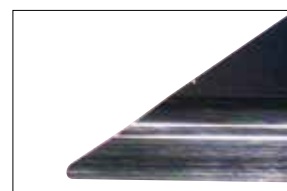
- E class : $\pm 0.025\text{mm}$

True R formation / Minus tolerance



- Existing one : $\pm 0.02\text{mm}$
- Minus tolerance : $0 \sim -0.02\text{mm}$

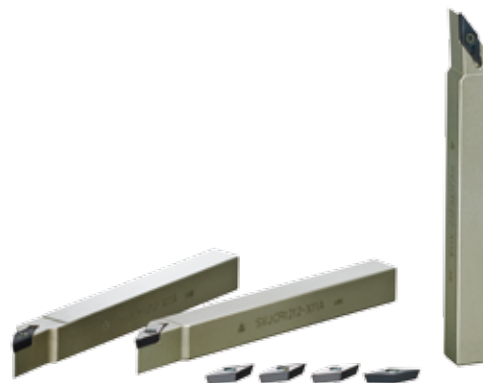
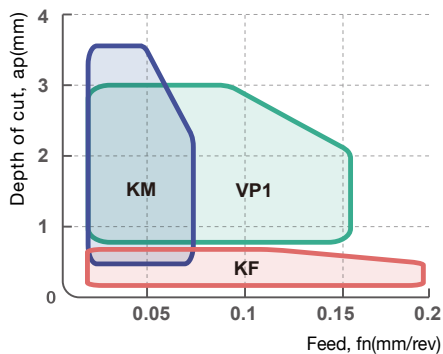
High surface quality



- Precise machining : High quality and precision

Offset adjustment is not required by insert change, due to the same insert height -> Increased productivity

▶ Machining Range



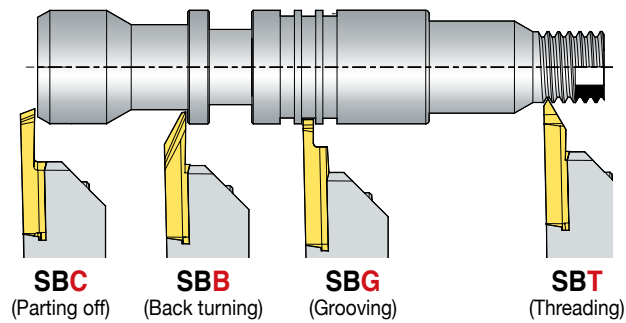
AUTO Tools Blade

Turning Insert for Automatic Lathes







► Features

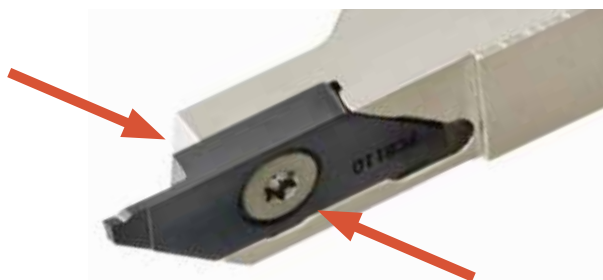
- Blade type insert for automatic lathes
- For machining precise small components
- 4 types - SBC(parting off), SBB(back turning), SBG(grooving), SBT(threading)
- Convenient use of one holder for all blade inserts



► Small Blade Insert

SBC (Parting off)	SBB (Back turning)	SBG (Grooving)	SBT (Threading)
 <ul style="list-style-type: none"> - Cutting width : 0.7~2.0mm - Dmax : 16mm - Nose R : 0.05mm 	 <ul style="list-style-type: none"> - Approach angle : 59° - Max. cutting depth : 4mm - Nose R : 0.05, 0.1, 0.2mm 	 <ul style="list-style-type: none"> - Width : 0.5~2.5mm - Nose R : 0.05mm 	 <ul style="list-style-type: none"> - V profile : 60° - Pitch : 0.2~1.0mm - Nose R : 0.05mm

► Small Blade Holder



- **Double side screw hole**
 - Easy insert clamping in both sides
 - Increased productivity
- **Insert corner change**
 - Repeated clamping tolerance : Within ± 0.025
 - Time save for offset adjustment

TB Series

3-Corner Grooving & Parting Tools for High Speed, High Feed and Interrupted Machining

▶ Features

- Minimized cutting force at high speed and high feed
 - Smooth chip evacuation outside each groove
- High precision cutting performance
 - Exceptional surface finish and accurate dimensions
- Excellent chip flow and cutting results
 - Ideal for automated and unmanned



TB5-M Chipbreaker

- **Lowered back area** : minimizes chip frictions to prevent overload when evacuating chips.
- **Beveled protruding dots** : form chip curls at regular intervals. Narrower chip width facilitates smooth chip evacuation outside each groove while these dots minimize chip control work load at high depth of cuts.
- **Cutting edge land** : Prevents chipping and improves machining stability in interrupted cutting.

Designation	TB5050N-M ~ TB5120N-M	TB5140N-M ~ TB5178N-M	TB5196N-M ~ TB5239N-M	TB5247N-M ~ TB5287N-M	TB5300N-M ~ TB5318N-M
Shape					
Cutting edge width (b)	0.5 ~ 1.2mm	1.40 ~ 1.78mm	1.96 ~ 2.39mm	2.47 ~ 2.87mm	3.0 ~ 3.18mm

TB4-M Chipbreaker

- **Sub dots** : control stability of chip curls at high feed.
- **Main dots** : form chip curls at regular intervals. Narrower chip width facilitates smooth chip evacuation outside each groove while these dots show exceptional chip control in turning and chamfering applications.
- **Sharp cutting edges** : deliver sharp cutting performance.

Designation	TB4150R-M ~ TB4185R-M	TB4200R-M ~ TB4228R-M	TB4300R-M ~ TB4350R-M	TB4400R-M ~ TB4450R-M
Shape				
Cutting edge width (b)	1.5 ~ 1.85mm	2.0 ~ 2.8mm	3.0 ~ 3.5mm	4.0 ~ 4.5mm

Aero Mill-Plus

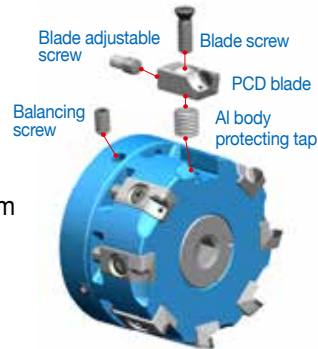
High Speed Milling Tool with Indexable PCD Blades

► Features

- Through coolant precisely directed at high heat cutting interface area improves tool life up to 20%
- Increased blade density provides higher feed milling and increased productivity
- Applying spanner adjustments can significantly reduce set-up time
- Lightweight Aluminum cutter body allows higher speeds for improved cutting performance

► Structure of Aero Mill Plus Cutter

- Aluminum alloy body enables lighter weight which prevents overload on the spindle bearings
- Stable tool life and applied number of blades are possible with the use of exclusive cutter for PCD blades
- Improved tool life by applying a direct spraying coolant system
- A simple structure without set screws
- Reduced weight and exclusive coolant bolt with internal chip removal coolant



► Application Area



► Type



Cutter

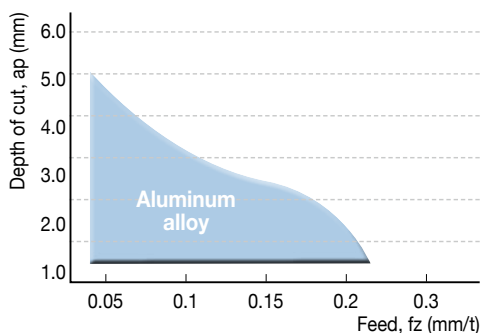
Ø80 ~ Ø315



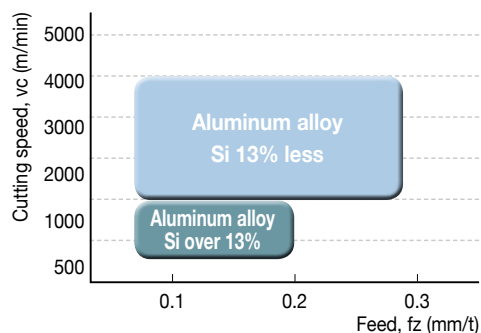
Blade

BAMPR-XAF
BAMPR-XAW
BAMPR-XAWR

► Application Range



► Recommended Cutting Speed



Alpha-Mill

Highly Efficient Multi-Functional Milling Cutter
Maximizing Performance in a Variety of Applications

▶ Features

- Extended range of sizes enables high feed and high depth of cut in the new line-up of Alpha Mill Series
- With available smaller sized inserts the increase in insert density offers improved productivity with increased potential of cutter feed
- Larger inserts provide deeper depth of cut, increased rigidity and increased metal removal



- Minimized interruption and improved chip evacuation
- Convex and concave shaped inserts for higher rigidity and wider chip pockets
- High rake cutting edges for reducing cutting force



- Through coolant system
- Screw-on clamping system
- Possible to clamp with both sockets and mounting bolts

▶ Application Area



Facing



Shouldering



Slotting



Ramping



Helical cutting



Through Coolant System

▶ Type



Cutter

Ø32 ~ Ø200



Shank









Ø10 ~ Ø63



Modular

Ø10 ~ Ø40

▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	Sharp cutting edge and buffed surface for aluminum machining shows excellent cutting performance
ML 		For hard-to-cut materials	Chip breaker design of low cutting loads shows excellent tool life and surface finish for hard-to-cut machining
MF 		For light cutting	Chip breaker design of low cutting loads and stronger cutting edges than ML C/B for light machining
MM 		For general cutting	Chip breaker design for general purpose that shows quality results in most milling applications

BRE

High Performance Roughing Ball Endmill

► Features

- Insert and body design provide excellent cutting performance
- High rigidity body
 - Better tool life and stability through the special surface treatment to strengthen the holder and screws for strong clamping
 - Excellent chip control and external quality with the 3D flute design
- Insert
 - For high speed and high feed machining with the use of a grade of resistance to both fracture and wear
 - Stable performance through strong cutting edges and high rake chip breakers

► Insert Features

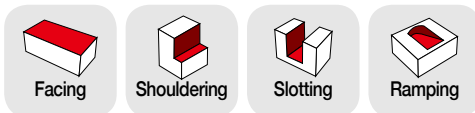


- Smooth chip flow
- Improved cutting heat evacuation



- Stronger clamping with the use of the recess
- Improved cutting strength by thickening

► Application Area



► Type



Shank
Ø20 ~ Ø63



Insert
SDMT-MM / SPMT
SPMT-MM / ZDMT-R-MM
ZPMT-R-MM / ZPMT-R-MR

FMR P-positive

Future Mill Series for Mold Making

Features

- High rigidity and anti rotating technology
 - Stable clamping system provides stable machining and productivity
 - Varied product line-up ensures wide application range
 - Optimal shape and grade for machining high hardness steel and hard-to-cut materials machining
 - P-positive relief angle (11°) for excellent performance in high hardness mold steel and HRSA
 - Flat clearance face of insert prevents interference and rotation while machining
 - Optimal grades and chip breakers for various workpieces
- ▶ **Chip breaker**

 - Concave shape ensures wide chip pockets and lowers cutting heat

▶ **Clearance face for preventing rotation**

 - Prevents rotation in machining / Divides corners
 - Prevents interference in high-feed machining
 - Ensures stable clamping

▶ **Through-coolant system**

 - Superb chip evacuation
 - Low cutting heat results in extended tool life

▶ **Sockets are compatible with mounting bolts in clamping(>Ø80)**

 - Big cutters are now lighter with wider internal diameter
 - Increased convenience by the use of compatible clamping and lighter weight











Application Area



Type



Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	Sharp cutting edge and buffed surface for aluminum machining show excellent cutting performance
ML 		For titanium and Inconel	Chip breaker design of low cutting load and strong edge shows excellent surface finish for titanium machining
MF 		For light cutting	Chip breaker design of low cutting loads for light machining
MM 		For general cutting	Chip breaker design for general purpose that shows quality results in most milling applications
No code 		For high hardness materials	Optimal for high hardness die steel and heat-resistant alloy

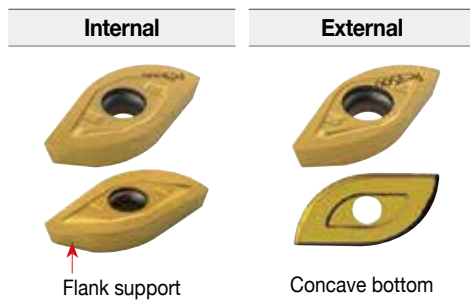
GBE

Indexable Ball Endmill for General Cutting



Features

- Indexable Ball Endmill for medium machining and roughing of mold and die
- Long tool life with the use of high hardness grade
- High accuracy helical cutting edge
- Through coolant system for higher productivity
- Roughing and medium cutting were enabled in medium to large scale mold making
- A wide selection of holders(normal type and long type)

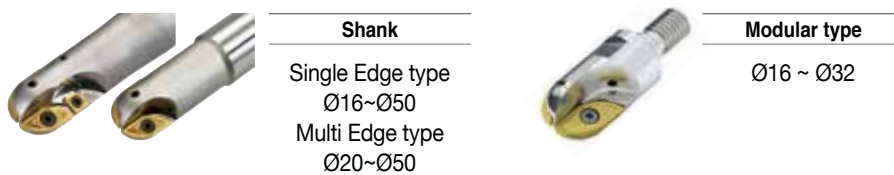


- Ability to handle high accuracy & large depth of cut applications
 - Run-out : within 0.05mm
 - Nose R accuracy : within 0.05mm
- Minimized cutting resistance due to helical cutting edge
- Anti-rotation of insert due to concave bottom & stable setting by flank support
- Long tool life & better performance with the use of 2 inserts and a new grade

Application Area



Type



- A wide product range thanks to various diameters of holders
- Through coolant system - direct spraying on the cutting area for improved chip control and longer tool life



HRMDouble

Optimized Economy in High Feed Milling



► Features

- HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with a 3 edge positive insert
- High rake angle cutting edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting edge and double sided function
- Simple screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting edge is applicable for both R and L type machining

► Application Area



► Type



Cutter

Ø40 ~ Ø315



Shank

Ø16 ~ Ø63









Modular

Ø16 ~ Ø40

► Chip Breaker Features

- R type cutting edges for higher rigidity in ramping and pocket milling
- Stable clamping contact
- Excellent surface finish at high feed
- Lower cutting resistance and excellent cutting performance with the use of a high rake chip breaker

Chip breaker	Cutting edge	Application	Features
MM 		For general cutting	Chip breaker design for general high feed milling that shows quality results in most milling applications
MF 		For light cutting	Chip breaker design of low cutting loads for light machining
ML 		For hard-to-cut materials	Sharp cutting edges of low cutting resistance and excellent welding resistance for hard-to-cut materials

HFM

High Performance Small Diameter High Feed Milling Tool



Features

- Small diameter tools for stable high feed, high efficiency, high productivity machining in a variety of materials
- Specialized insert design optimizes performance, productivity and efficiency



Variable Land

- Negative axial rake angle increases resistance to chipping

No. of tooth

- Increased insert density improves performance and extends tool life
- HRM(D) Ø20(2 teeth) → HFMØ20(5 teeth)

Major cutting edge

- Helical cutting-edge design improves sharpness of cutting edge and increases corner edge strength

Relief angle

- 2-Step Relief Angle (11°, 13°)
Increases rigidity and prevents interference

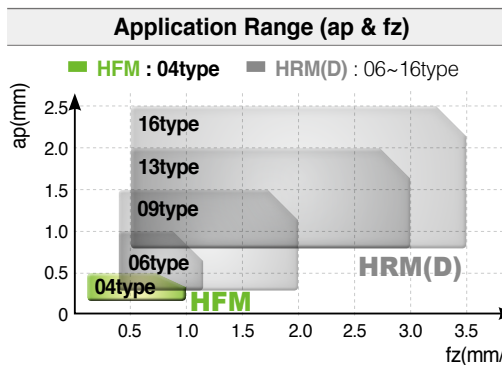
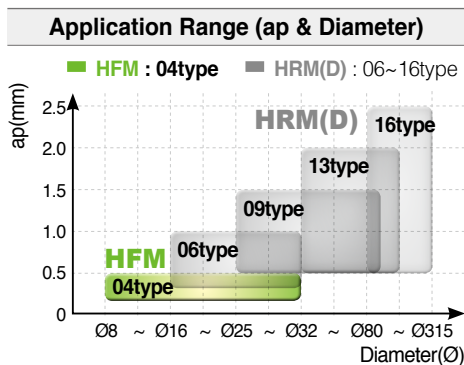
Application Area



Type



Application Range



Pro-A Mill

Indexable Endmill for General Aluminum Machining



Features

- Small sized modular type for aluminum machining
- A wide range of aluminum machining with the use of modular system as well as small size inserts
- Excellent performance in shouldering and curved surface machining
- High rake angle chip breakers for improved surface finish and lower cutting force
- Through coolant system for better chip evacuation and cooling effect

Application Area



Type



Pro-X Mill

Ultra High Performance High Speed Milling Tool for Aluminum

▶ Features

- The buffed rake surface of chip breaker effectively improves chip flow and reduces built-up edges
- High rake angle insert for lower cutting resistance and excellent surface finish
- Specially designed and strong tool body for high speed machining
- Suitable design for shouldering and curved surface machining

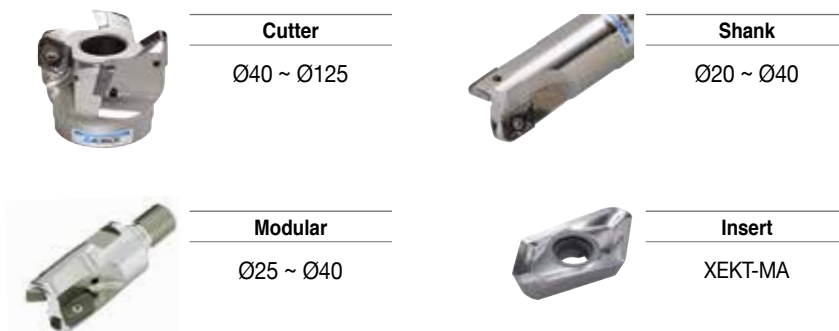
▶ Clamping System for High Speed Machining



▶ Application Area



▶ Type



Pro-L Mill

Excellent Surface Finish Milling of Aluminum and Hard-to-Cut Materials



Features

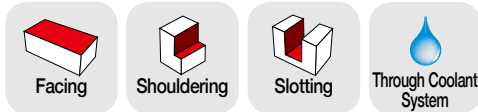
- Improved perpendicularity and lower cutting resistance by the use of high helix cutting edges and clearance face
- 2-screw on system for strong clamping
- Better chip evacuation due to helical type chip pockets and a coolant system



- Various nose radiuses
- Improved chip evacuation and tool life due to a through coolant system
- 2-screw on system for strong clamping
- Better perpendicularity and lower cutting resistance due to high helix cutting edges



Application Area



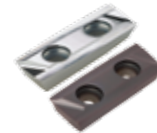
Type



Cutter
Ø63







Shank
Ø32 ~ Ø63



Insert
LXET-MA
LXET-ML

Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum machining	Buffed design and specially designed cutting edges for machining aluminum
ML 		For hard-to-cut materials	Sharp cutting edges of low cutting resistance for machining hard-to-cut materials

Selection of Grade and Chip Breaker

Category	M (Stainless steel)	N (Aluminum alloy)	S (HRSA)
Grade	PC5300/PC5400	H01	PC5300/PC5400
MA	-	○	-
ML	○	-	○

Rich Mill Series

Performance and Economy in One Milling Tool Series



► Features

- Rich Mill series is one of the innovations that provides more cutting edges with double sided inserts and longer tool life
- Unique chipbreaker and cutting-edge designs reduce cutting loads and help increase tool life
- A wide range of applications from steel and stainless steel to cast iron and aluminum
- Thick inserts improve rigidity and reliability
- Rich Mill series has a screw on system and a lath clamping system

► Rich Mill Series Lineup

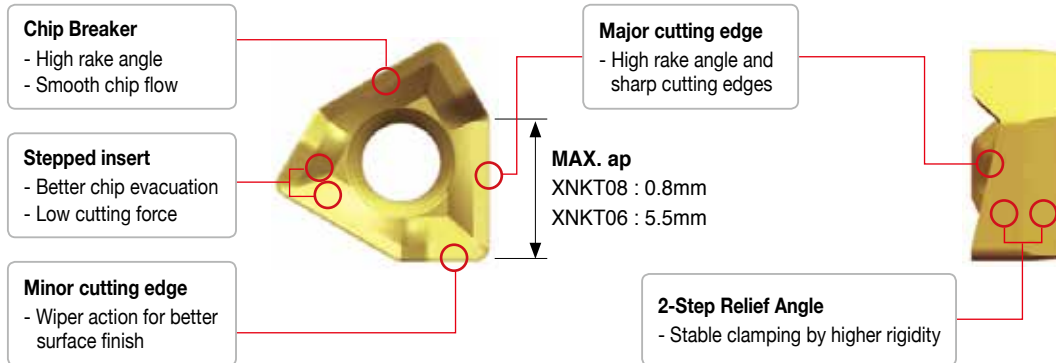


Rich Mill RM3

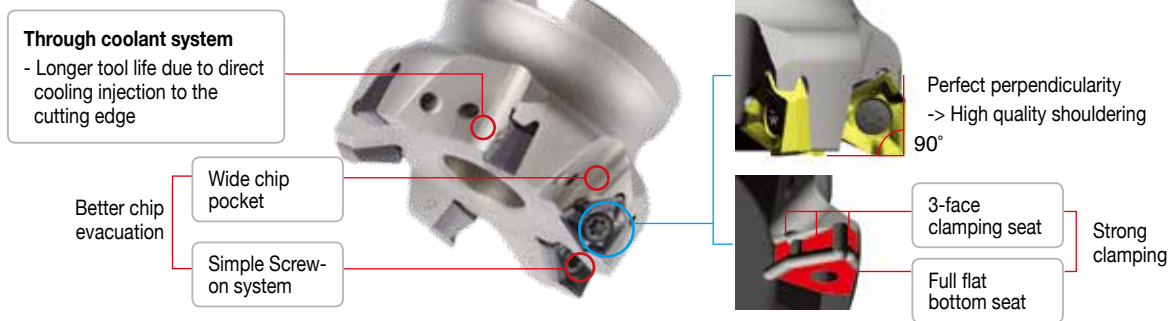
True Perpendicularity in a Multi-Functional High Productivity Shoulder Milling Tool

- True perpendicular shouldering that improves surface finish
- Excellent Productivity - Strong thick insert and 3-face clamping for stable milling even in the toughest condition
- A Great Value – True perpendicular shoulder milling, high quality surface finishes, stability and high performance contribute to a more efficient manufacturing process and a reduction in operational costs

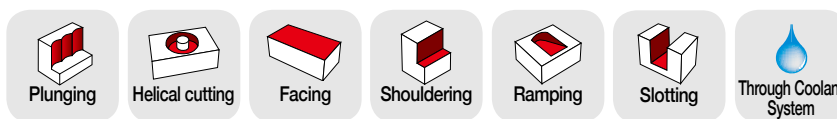
Insert Features



Cutter Features









Application Area



Type



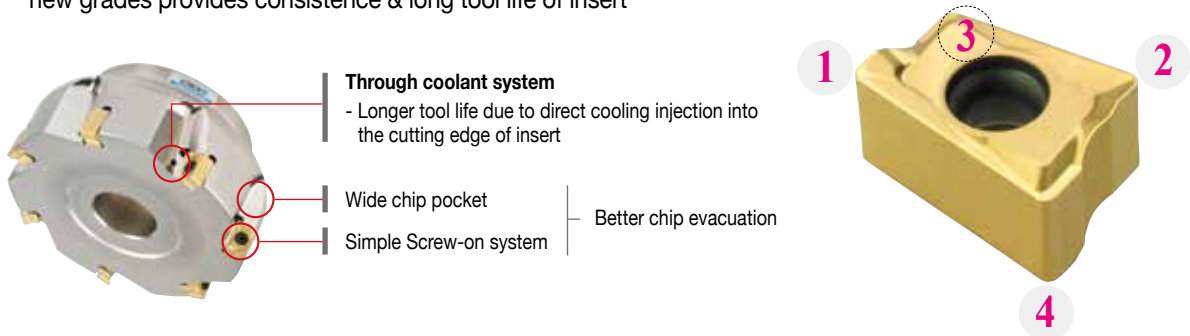
Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	Sharp cutting edge and buffed surface for aluminum machining show excellent cutting performance with smooth chip flow and high welding resistance
ML 		For light cutting	Chip breaker design of low cutting loads and stronger cutting edges for light machining and hard-to-cut machining
MM 		For General cutting	Chip breaker design for general shoulder milling specially useful in most applications

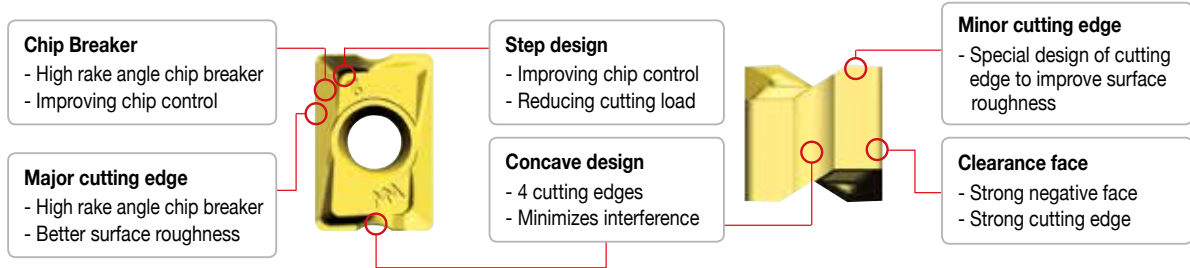
Rich Mill RM4

Multi-Functional Milling Tool with Economical 4-Corner Inserts

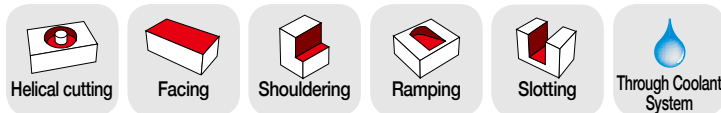
- RM4, as a multi functional milling tool, offers economical 4 cutting edges by using an innovative double-sided insert
- Special designed chip breaker consists of high rake angle and strong cutting edge to decrease the cutting load
- RM4 is multi functional tool that can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert



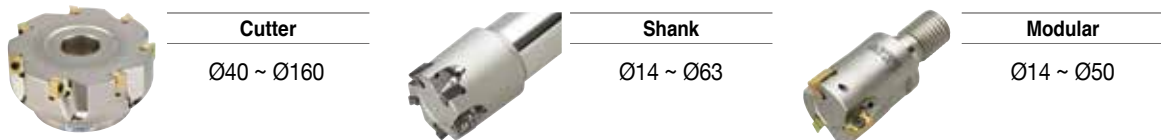
Insert Features









Application Area



Type



Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	Sharp cutting edge and buffed surface for aluminum machining show excellent cutting performance with smooth chip flow and high welding resistance
MF 		For light cutting	Chip breaker design of low cutting loads shows excellent tool life and surface finish for light machining and hard-to-cut machining
MM 		For General cutting	Chip breaker design for general shoulder milling specially useful in most applications.

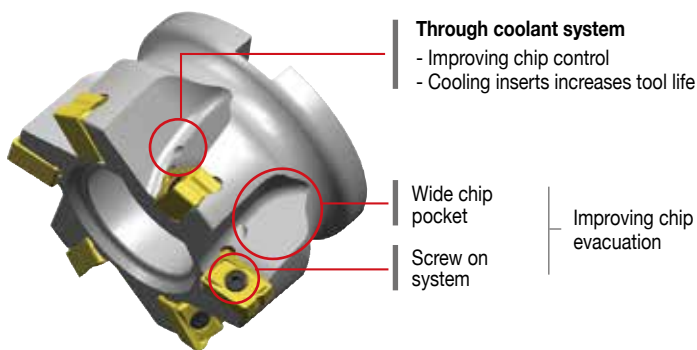
Rich Mill RM4Z



▶ Plunge Mill RM4Z

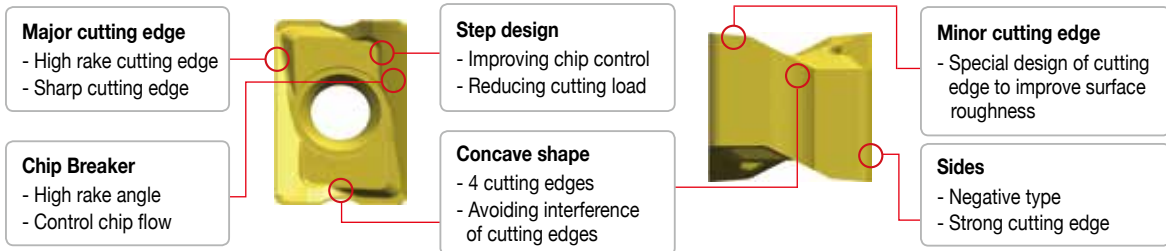
- Rich mill series RM4Z is a plunge mill for high efficiency vertical machining such as slotting and pocketing in roughing applications.
- Rich mill series RM4Z is a highly efficient milling tool for plunging, shouldering and facing. It makes operations more economical with the use of its double-sided 4-corner insert
- Plunge machining reduces lead time for high productivity and precision machining.
- In plunging the max depth of RM4Z 3000 type is 9.0mm and that of RM4Z 4000 type is 14.0mm

▶ Cutter Features

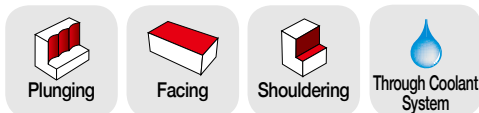


- Double-sided insert 4 corner available
- High rake angle chip breaker and cutting edge
- Various available machining types
- High-efficiency and economical insert
- Negative type insert - Strong cutting edge

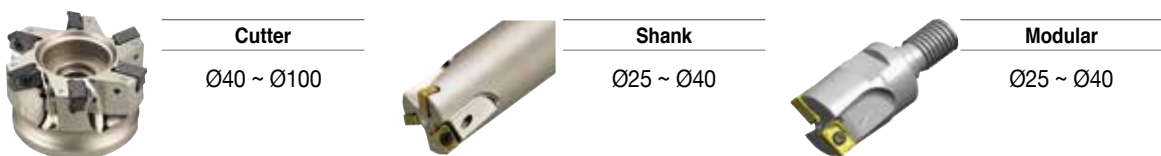
▶ Insert Features



▶ Application Area



▶ Type

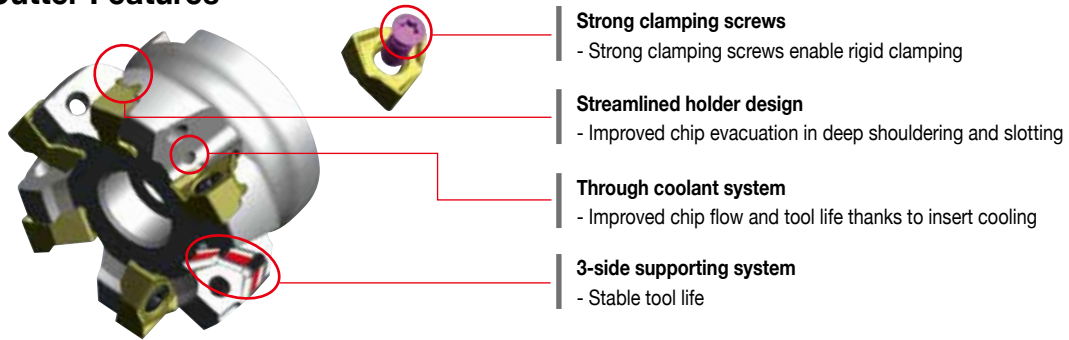


Rich Mill RM6

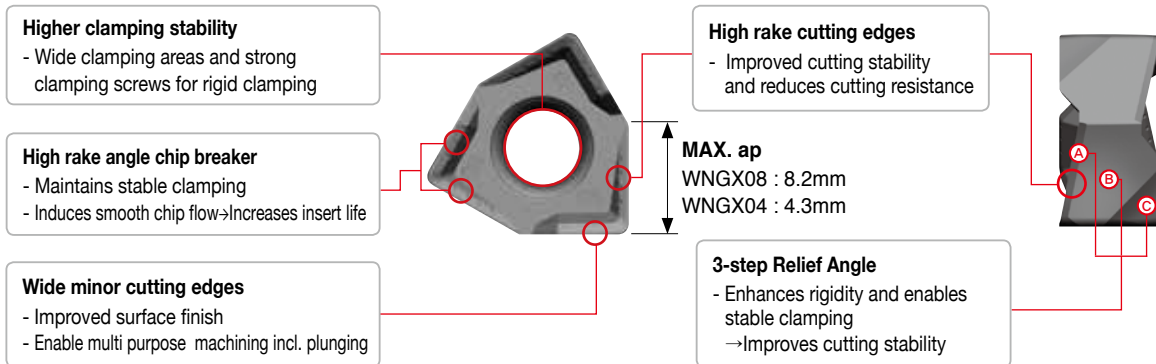
▶ RM6 Features

- Stable clamping - 3 clamping surfaces on the side and strong clamping screws
- High quality results - High precision, excellent perpendicularity, outstanding surface finish on the flank, accurate tolerance.
- High productivity - High rake angle and sharp cutting edges for lower cutting resistance → Ideal for high speed and high feed machining

▶ Cutter Features



▶ Insert Features









▶ Application Area



▶ Type



▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	- Sharp cutting edges for excellent cutting performance in aluminum machining - Buffed surface for excellent chip flow and welding resistance
ML 		For light cutting	- Chip breaker design of low cutting resistance, ideal for light cutting and machining hard-to-cut materials - Excellent tool life and quality results
MM 		For general cutting	- Chip breaker design ideal for general shoulder milling and most applications

Rich Mill RM8

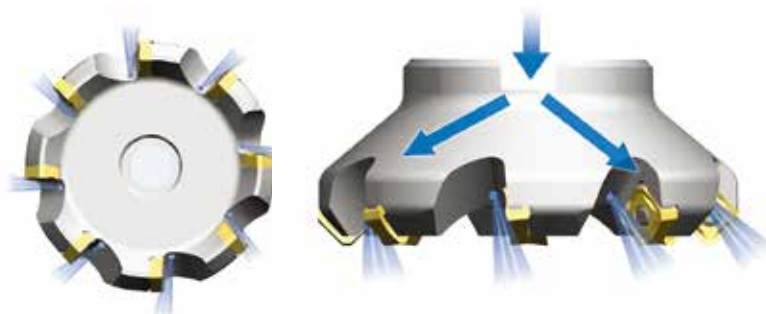
▶ Economical 8-corner Double Sided Insert

- RM8 is a multi-operational milling tool that uses 8 corners
- Specially designed chip breaker and cutting edge provide longer tool life and lower cutting loads, which results in excellent performance in machining steel, stainless steel, cast iron, aluminum, etc
- The harmony between a strong insert and a new grade with high chipping resistance provides excellent durability and tool life
- A wide range of applications available with the use of various pitches, cutters and chip breakers
- Lighter cutter for high speed cutting and low horse power machine



▶ Through Coolant System

- Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling effect
- To get optimal chip evacuation, the direction of coolant injection has been designed to reach each cutting edge directly
- Through coolant arbor is required



Through Coolant System for decreasing cutting heat and improving chip evacuation

▶ Application Area













▶ Type



Cutter

Ø50 ~ Ø400

▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum	Sharp cutting edge and buffed surface for aluminum machining show excellent cutting performance with smooth chip flow and high welding resistance
ML 		For hard-to-cut materials	Chip breaker design of low cutting loads shows excellent tool life and surface finish for hard-to-cut machining
MF 		For light cutting	Chip breaker design of low cutting loads shows excellent tool life and surface finish for light machining and hard-to-cut machining
MM 		For General cutting	Chip breaker design for general purpose that shows quality results in most milling applications
W 		Wiper	Special edge design specially developed for finish milling and increased surface finish

Rich Mill RMH8

▶ Screw-on Clamping System

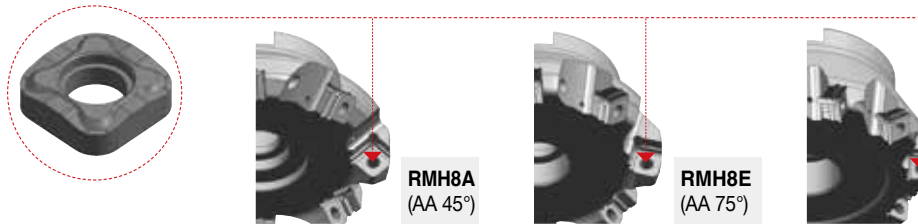
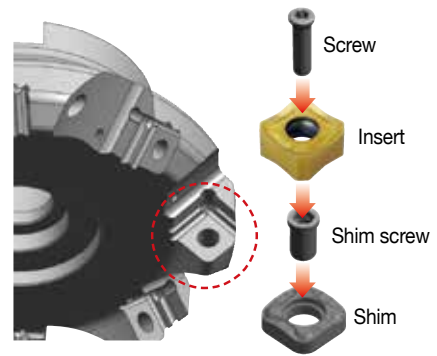
- Only the screw clamping secures stable clamping force

▶ Reinforced rigidity and enhanced clamping power

- The shim protects the cutter from damage by insert breakage
- The upper and lower side of a shim are grounded to secure tight clamping

▶ Compatible Shim

- One type shim is applied to cutters with A.A. 45°, 75°, 88°
- Stable clamping with the use of the identical shape with an insert clamping seat



▶ Application Area



▶ Type



Cutter

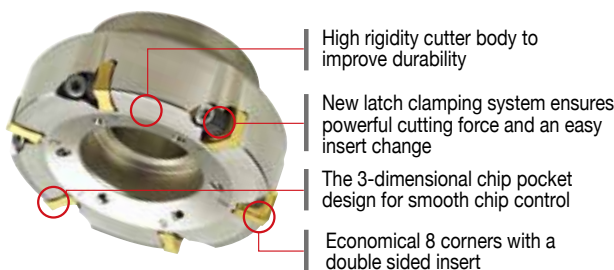
Ø50 ~ Ø400

Rich Mill RMT8

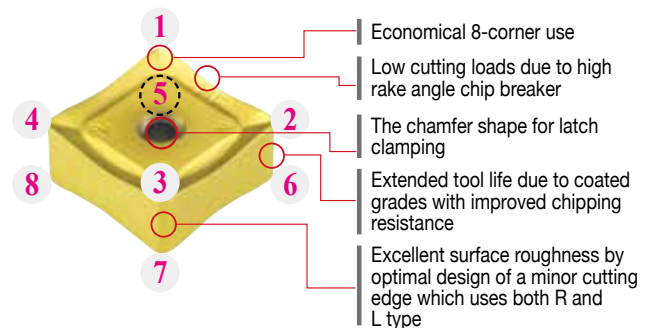
▶ RMT8 with Latch Clamping System

- New latch clamping system provides a powerful cutting force and an easy insert change
- New grades with higher chipping resistance provide excellent surface roughness and longer tool life
- All application ranges are covered by sharp and strong cutting edges
- RMT replaces every ISO milling due to a wide selection of pitches

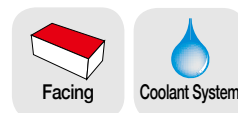
▶ Cutter Features



▶ Insert Features (both R/L type)



▶ Application Area







▶ Type



Cutters type

Ø80 ~ Ø315

▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MF 		for light cutting	Chip breaker of low cutting loads for light cutting and hard-to-cut materials with the result of excellent tool life and surface finish
MM 		for general cutting	Chip breaker design for general purpose that shows quality results in most milling applications

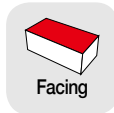
Rich Mill RM16

▶ Economical 16-corner Double Sided Insert

- Largely reduced cost in medium cutting of cast iron and steel
- A wiper insert can be used for improving surface finish
- The harmony between strong cutting edges and a variety of new grades with high chipping resistance provides higher durability and long tool life
- When 16 corners are used, the maximum cutting depth of RM16 6000 is 4.0mm and RM16 8000 is 5.5mm
- A wiper insert is clamped on the same seat for better surface finish
- When the feed per rotation is bigger than the length of wiper cutting edge (7mm), 2 wiper inserts should be placed in the symmetrical position



▶ Application Area













▶ Type



Cutter

Ø63 ~ Ø400

▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
MA 		For aluminum and light cutting	Sharp cutting edge and buffed surface for aluminum machining shows excellent cutting performance with smooth chip flow and high welding resistance
MF 		For light cutting	Chip breaker design of low cutting loads shows excellent tool life and surface finish for light cutting and hard-to-cut machining
ML 		For hard-to-cut materials	Chip breaker design of low cutting loads shows excellent tool life and surface finish for hard-to-cut machining
MM 		For general cutting	Chip breaker design for general purpose that shows quality results in most milling applications
W 		Wiper	Special edge design specially developed for finish milling and increased surface finish

TP2P

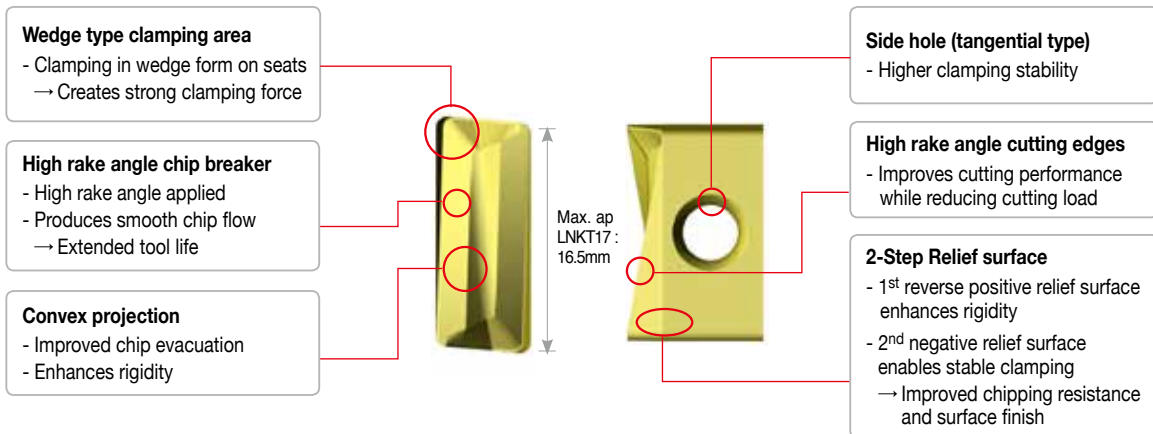
Tangential Shoulder Milling Tool



▶ Features

- Clamping stability gained through tangential clamping system and wedge-shaped inserts
- Excellent surface finish nearly perfect perpendicularity and highly even flank surface compared to competitors designs
- Improved productivity due to high rake angles and sharp cutting edges which lead to lower cutting resistance → Ideally suited for high speed and high feed machining

▶ Insert Features







▶ Application Area



▶ Type



▶ Chip Breaker Features

Chip breaker	Cutting edge	Application	Features
ML 		For light cutting	Chip breaker design for low cutting resistance that provides excellent tool life and quality surface finishes in light cutting and hard-to-cut materials
MM 		For general cutting	Universal design for general shoulder milling operations, highly suitable in most applications

Wind Mill

For slotting and parting off with various corner radius sizes and widths

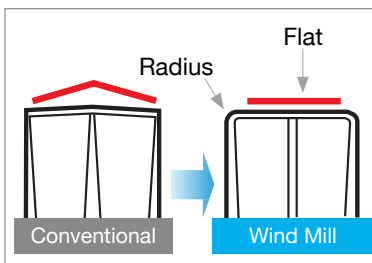
► Features

- Precision machining for slotting applications
- A unique recess design on the minor cutting edge reduces cutting loads and improves tool life
- A special clamping system prevents incorrect clamping and fracture

- Ideal geometry for superior surface finish and extended tool life

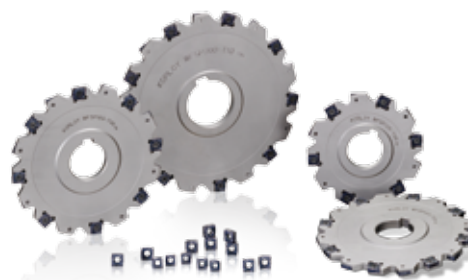
- Perpendicular slot

- Special dots on the seat prevents wrong handed clamping and fracture



- Workpieces with varying widths and corner radius sizes (R0.2 ~ R2.0)

R0.2	R0.4	R0.6	R0.8	R1.0
R1.2	R1.4	R1.6	R1.8	R2.0



► Application Area



► Type



Cutter

Ø100 ~ Ø250

Insert

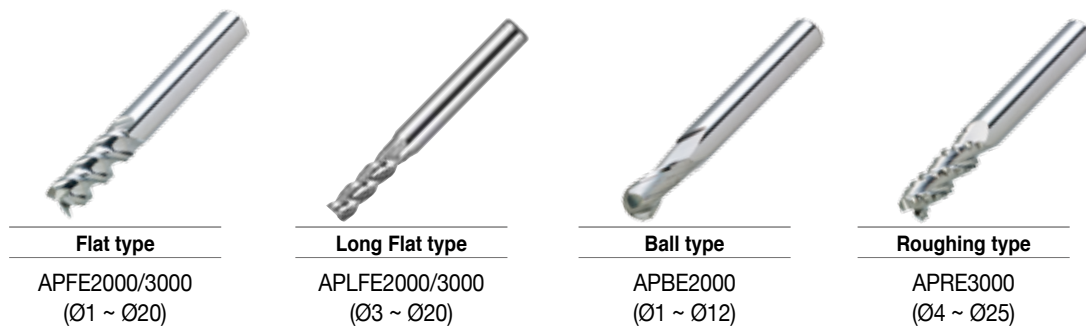
SNHT110□□R/L-WX
SNHT120□□R/L-WX

A+ Endmill

Endmill Series for Machining Aluminum Alloy

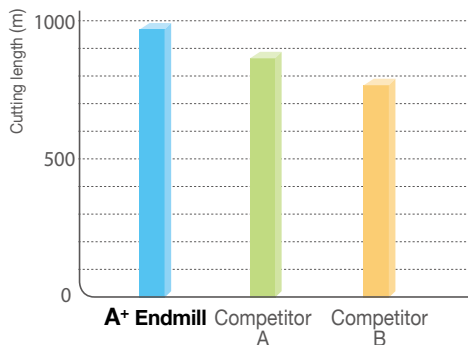
► Features

- A wide selection of designations and sizes in stock management
- Exclusive U shaped flutes improve chip evacuation at high feed
- Double relief angle strengthens rigidity of cutting edge



- Unique U shaped flutes
 - Excellent chip evacuation even in high feed machining
 - U shaped and buffed flute reduce built-up edges
- Double relief angle
 - Strong cutting edge provides high productivity
- Sharp cutting edge
 - For both roughing and finishing

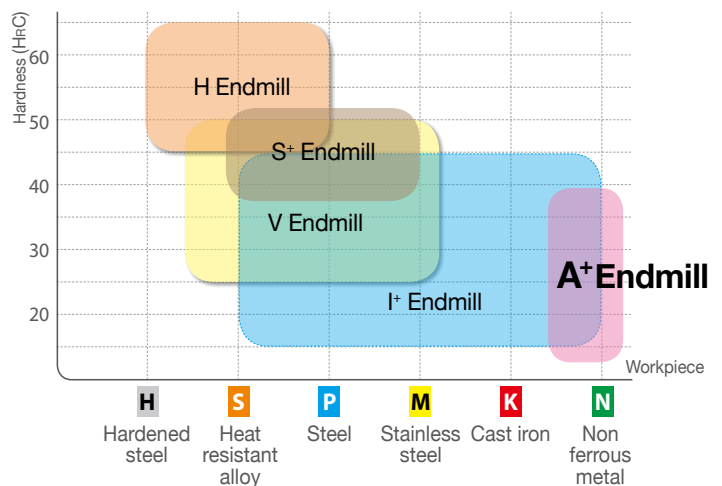
► Cutting Performance



- **Workpiece** AlZnMgCu1.5
- **Cutting conditions** diameter=Ø8.0 n(min-1)=8000
vc(m/min)=200 vf(mm/min)=1200
fz(mm/t)=0.05 ap(mm)=8
ae(mm)=2.0 wet

- **Cutting** A Plus Endmill / APFE3080-060 3teeth

► Application Range









I+ Endmill

Endmill Series for General Purpose

Features

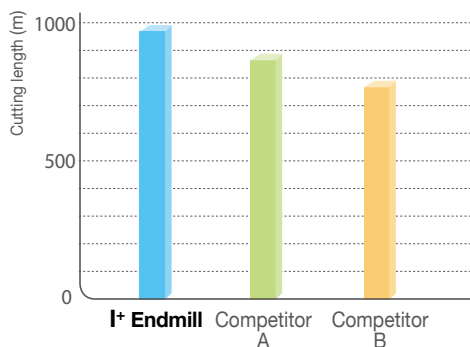
- A wide selection of designations and sizes in stock management
- A wide application range in general use for workpiece under HRC45
- Advanced coating technology shows excellent performance and provides cost reduction

					
Flat type	Long Flat type	Ball type	Long Ball type	Radius type	Long Radius type
IPFE2000/4000 (Ø1 ~ Ø20)	IPLFE2000/4000 (Ø1 ~ Ø20)	IPBE2000/4000 (Ø1 ~ Ø20)	IPLBE2000 (Ø1 ~ Ø16)	IPRE2000/4000 (Ø1 ~ Ø12)	IPLRE2000/4000 (Ø3 ~ Ø12)



- Tough substrate and wear-resistant coating
 - Increased tool life due to high resistance to chipping and wear
- Sharp cutting edge
 - For both roughing and finishing
 - For workpieces under HRC45
- Increased productivity
 - Cost reduction due to excellent performing and reasonable price

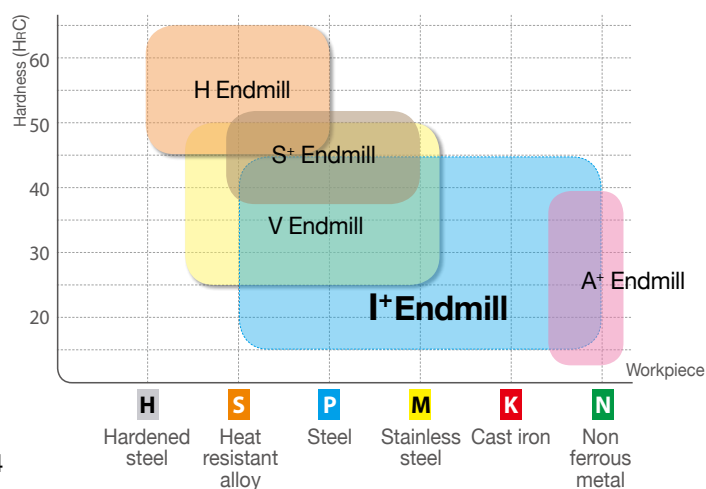
Cutting Performance



- **Workpiece** C45
- **Cutting conditions** diameter=Ø8.0 n(min-1)=5173
vc(m/min)=130.0 vf(mm/min)=1034
fz(mm/t)=0.1 ap(mm)=0.5
ae(mm)=1.6 dry

- **Cutting** I Plus Ball Endmill / IPBE2080-060 2teeth

Application Range



S⁺ Endmill

Endmill Series for Stainless Steel

Features

- A wide selection of designations and sizes in stock management
- Excellent performance in machining stainless steel alloy steel and hard-to-cut materials
- High rake angle and curvilinear chip pockets improve chip evacuation



Flat type

SPFE4000 (Ø1 ~ Ø12)



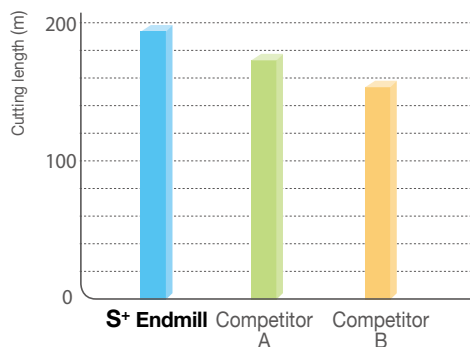
Long Flat type

SPLFE2000/4000 (Ø1 ~ Ø12)



- Smooth chip flow due to high rake angle and curvilinear chip pocket
- Specially designed cutting edges to prevent work hardening
- Optimal performance in stainless steel machining
- For machining general steels, stainless steel and heat resistant alloy
- Multi utility tools for plunging, grooving, ramping, etc

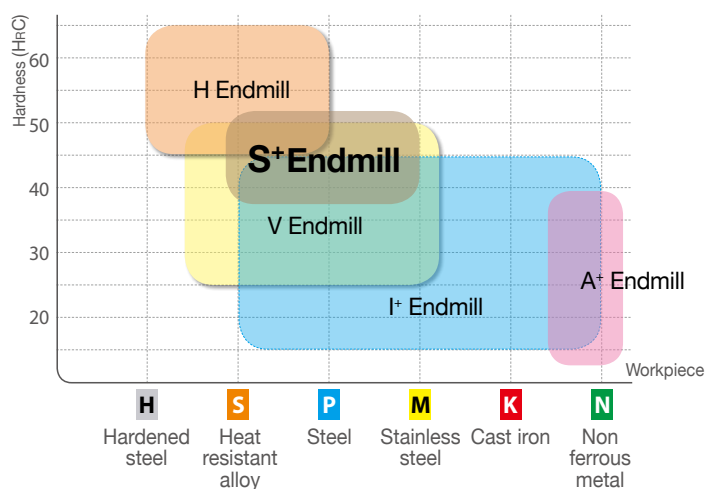
Cutting Performance



- **Workpiece** X5CrNi18-10
- **Cutting conditions** diameter=Ø8.0 n(min-1)=4000
vc(m/min)=100 vf(mm/min)=480
fz(mm/t)=0.04 ap(mm)=8
ae(mm)=0.8 dry

- **Cutting** S Plus Endmill / SPFE4080-060 4teeth

Application Range



R⁺ Endmill

High Efficient Roughing Endmill Series

► Features

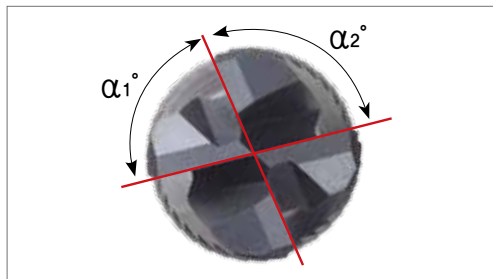
- Endmill for medium cutting to roughing
- Cost-effective cutting edge design for roughing
- Specifically designed corners as irregular indexing & helix
- Optimized blade design for the best performance
- Serrated edge form provides soft cutting for roughing
- The latest lubricative coating layers and high hardness grade(PC40T) applied
- The use of newly invented coating films and substrates enable stable machining even under the toughest cutting conditions



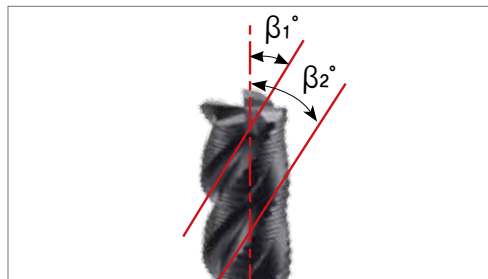
Soft cutting
 - Serrated cutting edges
 - 3 Combo R

Lower cutting
 - Ideal for medium to rough cutting
 - Special edge design

High quality results



Irregular indexing to prevent chattering ($\alpha_1 \neq \alpha_2$)



Irregular helix to disperse cutting force ($\beta_1 \neq \beta_2$)

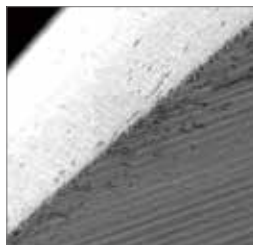
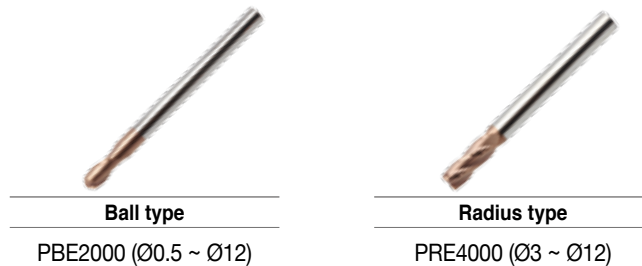
H Endmill

Endmill Series for High Hardened Steel Machining at High Speed

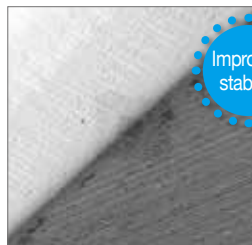


► Features

- For cutting high hardened heat-treated steel under HRC70
- New coating technology improves wear resistance
- A newly developed shape shows excellent cutting performance
- High speed precision machining provides higher productivity



Before

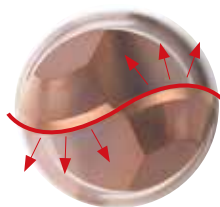


After special edge treatment

Improved stability

- New PC303S/PC310U grade
 - An ultra fine substrate and an AlTiSiN coating layer guarantee excellent wear resistance
- A wide range of applications for general purpose
 - A special cutting edge treatment was applied for less chipping and longer tool life
- High accuracy shank diameter with tolerance-h5
 - High quality production system enables tolerance-h5 throughout the whole series

► PBE Series (Ball)



S-shaped ball

Cutting load is dispersed

- The S shaped ball disperses cutting loads
- The tolerance of the ball radius is within $\pm 0.005\text{mm}$

► PRE Series (Radius)

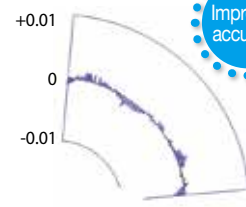


H Endmill radius



New shape of corner radius

- The new shape of corner radius reduces cutting loads
- The tolerance of corner radius is within $\pm 0.005\text{mm}$



Improved accuracy

Test result of corner R tolerance

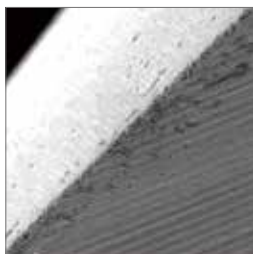
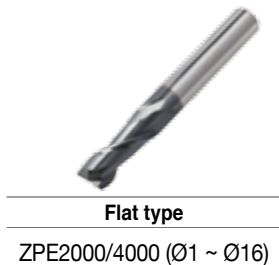
Z Endmill

Endmill Series for General Cutting

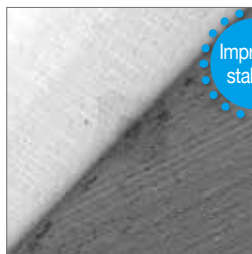


► Features

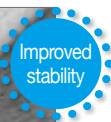
- Universal endmill for cutting various workpieces under HRC45
- A wide application range covers workpieces under HRC45 including carbon steel, alloy steel, cast iron, pre hardened steel, etc
- A newly developed shape and a coating film show excellent cutting performance and prolong tool life
- Optimized blade design for less chipping and stable machining



Before

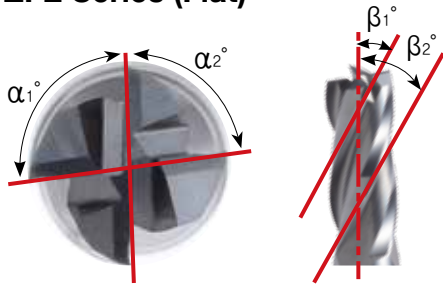


After special edge treatment



- New PC315E grade
 - An ultra fine substrate and a lubricative coating layer guarantee excellent performance at high temperature and high speed
- Special edge treatment
 - A special cutting edge treatment was applied for less chipping and longer tool life
- High accuracy shank diameter with tolerance-h5
 - High quality production system enables tolerance-h5 throughout the whole series

► ZFE Series (Flat)



$\alpha_1 \neq \alpha_2, \beta_1 \neq \beta_2$ Irregular indexing & helix

- Irregular indexing & helix prevent chattering and improves surface

► ZBE Series (Ball)



S-shaped ball

- The S shaped ball disperses cutting loads
- The tolerance of the ball radius is within $\pm 0.005\text{mm}$

D Endmill

Diamond Coated Endmill Series



► Features

- Diamond coated endmill for machining graphite and ceramics
- Excellent wear resistance due to high hardness and high purity diamond coating
- Exceptional coating grip ideal for high speed and heavy duty machining
- Advanced surface finish and cutting performance thanks to sharp edges and tangential tool geometries



Flat type

DFE2000/4000 (Ø1 ~ Ø12)



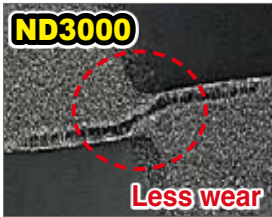
Ball type

DBE2000/4000 (Ø0.6 ~ Ø12)

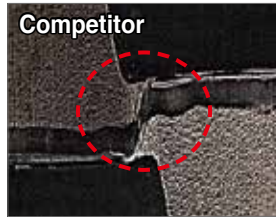
► Development of ND3000(Diamond Coated Grade)

- High hardness diamond coating for machining graphite and ceramics
- Good adhesion strength for high speed and heavy duty machining

① Less flank wear



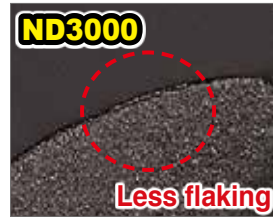
Less wear



Competitor

→ Reduced creation of massive flank wear on the relief surface due to excellent wear resistance

② Less edge flaking



Less flaking



Competitor

→ Reduced coating delamination due to excellent adhesion between coating and substrate



Tangential cutting edge geometries

- One-Pass grinding system
- Prevents stepped cone on the machined surface
- 2-flutes and 4-flutes tooling with a ball nose

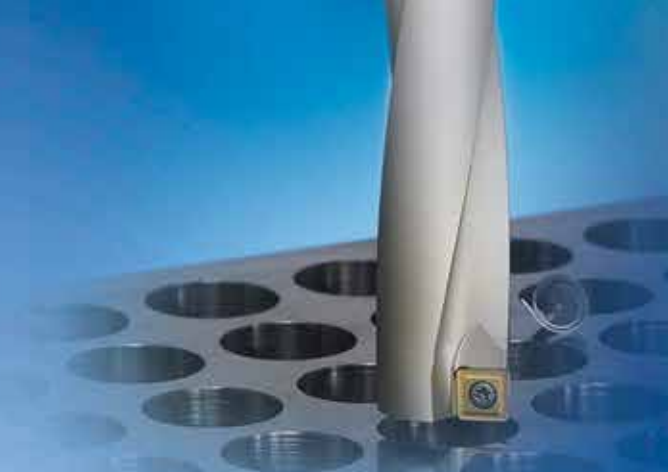
Center-matched ball shape (4-flutes)

- Ball point shape for high feed machining
- Improved rigidity and excellent surface finish

[DBE4000]

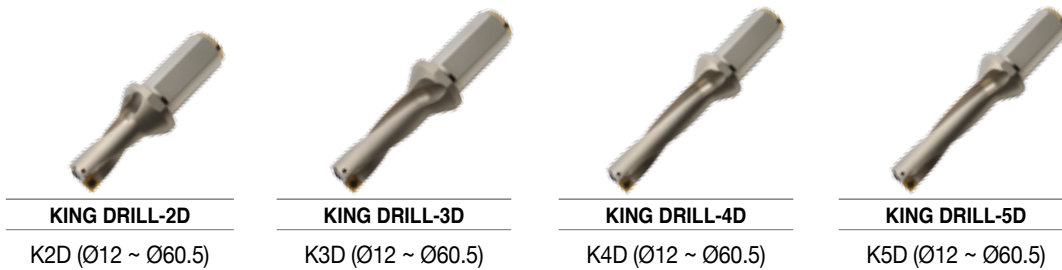
KING DRILL

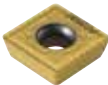
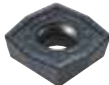
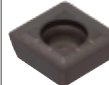




High Efficiency Indexable Drill



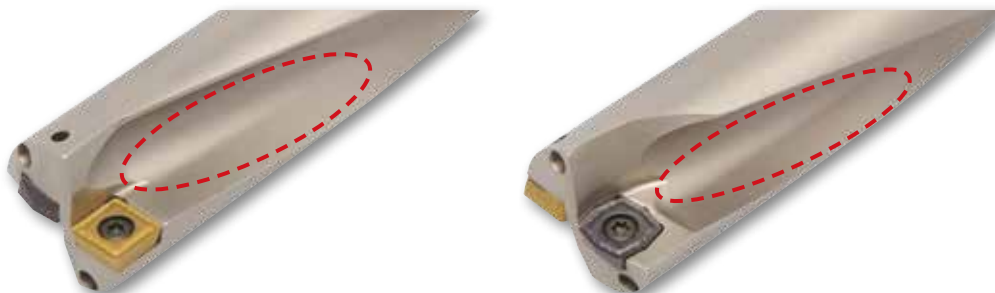
► Features

- A set of differently shaped central and peripheral inserts optimize the insert locations in order to maximize cutting tool life
- The balance between cutting edges and grades largely improves stability of tool life



Chip breaker	PD		LD		ND		RD
Feature	- Universal - Medium speed and medium feed		- Superior chip control for machining mild steel and stainless steel - Light cutting(at low ~ medium speed and low feed)		- Sharp cutting edge for aluminum machining - Insert surface buffed for high quality result - E Class Tolerance		- Improved chipping resistance - Excellent performance in case of frequent fracture and chipping on the cutting edge
Insert type	Peripheral	Central	Peripheral	Central	Peripheral	Central	Central
Shape	 SPMT-PD	 XOMT-PD	 SPMT-LD	 XOMT-LD	 SPET-ND	 XOET-ND	 XOMT-RD
Grade : Workpiece range	NC5330 : P, M, K PC3500 : P PC5300 : P, M, K, S PC6510 : K		PC5300 : P, M, K, S		PC5335 : P, M		H01 : N PC5300

- 2 Coolant Hole System



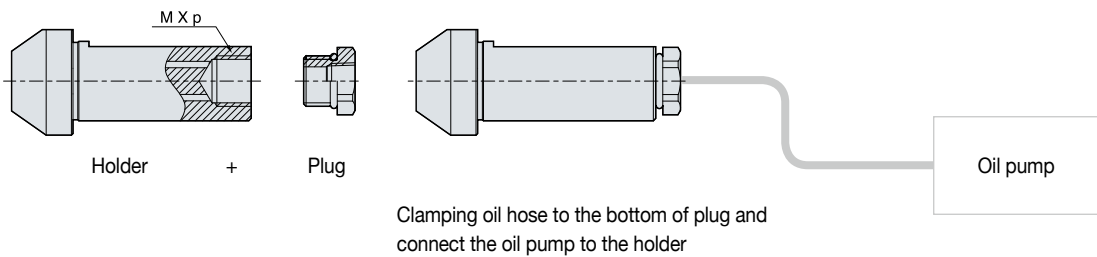
The optimized shape of flutes increases the rigidity of the drill body and improves chip evacuation

For general lathes and CNC lathes without internal cooling device general lathes and CNC lathes without a proper internal cooling device

KING DRILL - With Through Coolant System for Lathe

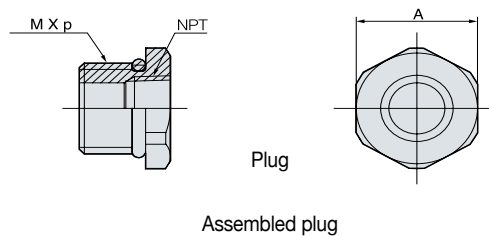
► Features

- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- PT Tap in the plug is combined to another PT Tap connected to oil hose
- Available to use the drill without a plug in milling machine



(mm)

Tap type	Drill dia.	Shank dia.	Mxp	Plug
K□D120~16020HP-□□	Ø12.0 ~ Ø16.0	Ø20	M12 x 1.5	PLG12PT18
K□D161~23525HP-□□	Ø16.1 ~ Ø23.5	Ø25	M16 x 1.5	PLG16PT18
K□D236~35532HP-□□	Ø23.6 ~ Ø35.5	Ø32	M20 x 2.0	PLG20PT14
K□D356~60940HP-□□	Ø35.6 ~ Ø60.5	Ø40	M27 x 2.0	PLG27PT38



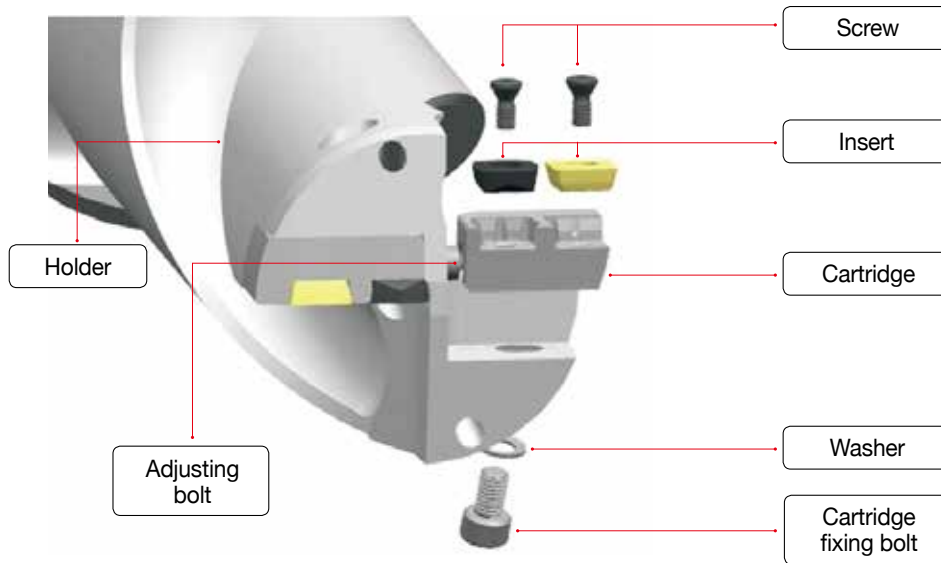
Plug type	Mxp	PT Tap	A
PLG12PT18	M12 x 1.5	1/8	16
PLG16PT18	M16 x 1.5	1/8	19
PLG20PT14	M20 x 2.0	1/4	26
PLG27PT38	M27 x 2.0	3/8	35

High rigidity drill produces cost efficiency with no need to replace drills but cartridge

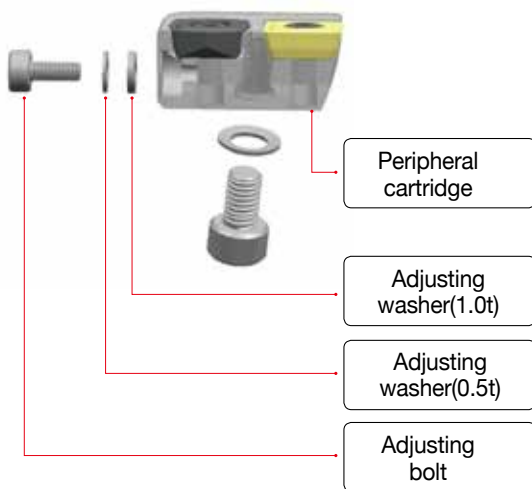
KING DRILL - For Large Diameter Drilling

► Features

- Cartridge type for $\varnothing 61 \sim \varnothing 100$ drilling.
- Peripheral cartridge can adjust the drilling diameter within 5mm.
- Easy to adjust drilling diameter with adjusting bolt.



► Adjustment of Drilling Diameter



Adjustment \varnothing (mm)	Adjusting washer	
	Designation	Width(mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305 + WA0310	1.5
4	WA0310 x 2	2.0
5	WA0305 + WA0310 x 2	2.5

※ Drilling diameter can be adjust up to 5mm with the use of adjusting washer

TPDB

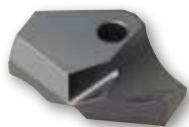
Top Solid Piercing Indexable Drill (Blade type)

▶ Features

- High precision clamping system
 - A high precision grinding process and an auto-centering system provide superior clamping accuracy
- Screw on clamping system
 - An easy clamping system for a quick change of TPDB insert
- Sharp cutting edges
 - Sharp edges for reducing cutting loads and excellent chip control and ultra fine substrate and exclusive coating film for extended tool life
- Highly durable holder
 - Holders with high rigidity and superb wear resistance due to special surface treatment



▶ Insert Features

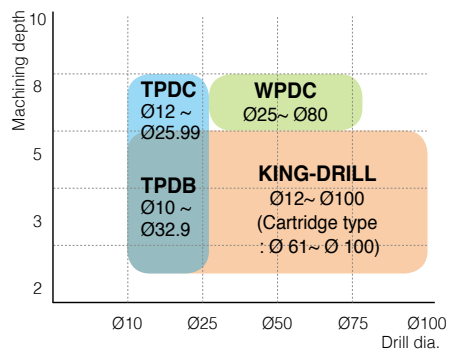
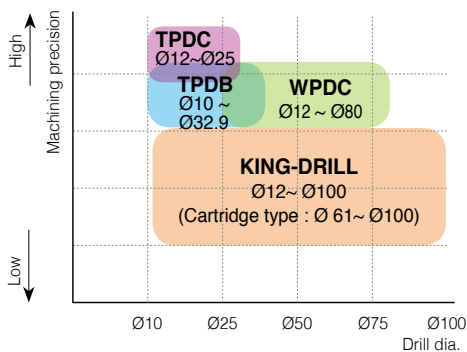


- Cutting edge with low cutting resistance
- Improved chip control due to chip breaker



- Screw on clamping system
- Flute design for excellent chip evacuation
- Superior rigidity and wear resistance of holders
- Auto-centering system

▶ Application Range

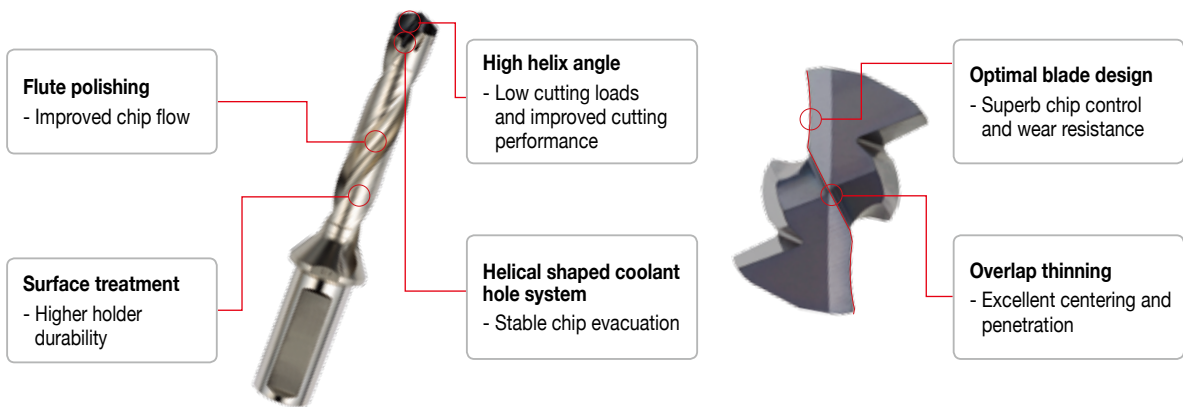


TPDC

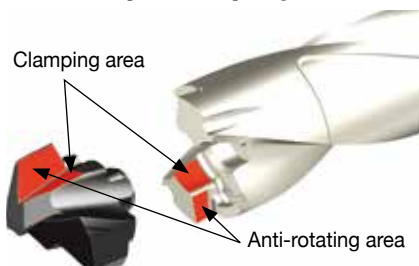
Top Solid Piercing Indexable Drill (Cone Type)

► Features

- Clamping design
 - One step clamp system for high rigidity and stability
 - Allows insert changes while the holder is attached on the machine, which shortens setting time
- Optimized blade design
 - Excellent chip control for wide application range in various types of materials
- Helical shaped coolant hole system
 - Wide chip pockets for stable chip evacuation
- Material Technology
 - Ultra-fine substrate and multi-layer coating guarantees excellent chipping and wear resistance



► One Step Clamp System



- One step clamp system on the clamping area enables easy and fast tool change with higher precision
- Anti-rotating area performs as a stopper
- Clamping area and anti-rotating area make an acute angle to prevent insert rotation while machining

MSFD

Mach Solid Flat Drill for Hole Making on Various Surface Types

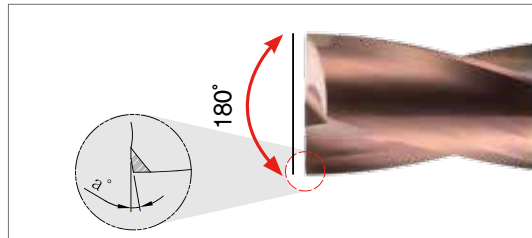
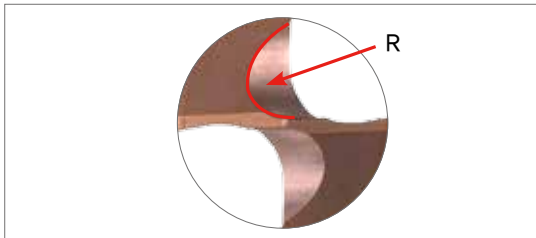
► Features

- The best tool for ramped, curved or flat workpieces
- High quality hole making capability with 180° point angle
- Improved anti chipping and welding resistance by edge honing and chamfering
Minimized creation of burrs compared to general drills

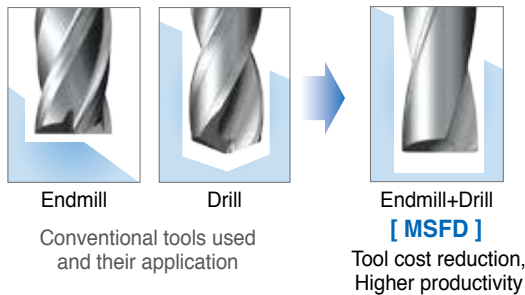


Cutting edge design

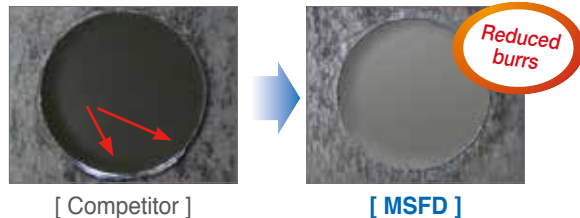
- Excellent straightness with its 180° point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Wider chip pockets by the use of 'R' shape on the thinning part



Productivity

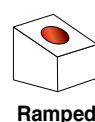
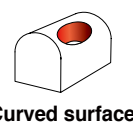
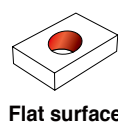
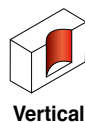


Burrs



► Application Area

- A wide range of applications and improved cutting performance



MLD Plus

Mach Long Drill Exclusive for Deep Holes

▶ Features

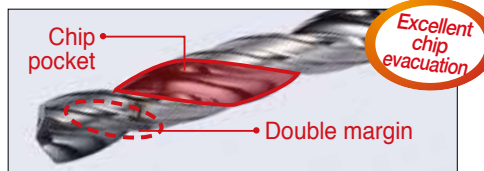
- High precision results when machining deep holes
- Excellent stability due to new added guide margin
- Strong wear resistance due to universal new grade PC315G

MLD-□ (P/K/N)

Ø3 ~ Ø10

Cutting edge and flute shape

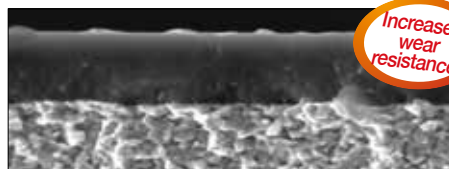
- Straight cutting edge provides better rigidity
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability



[Flute]

New grade(PC315G)

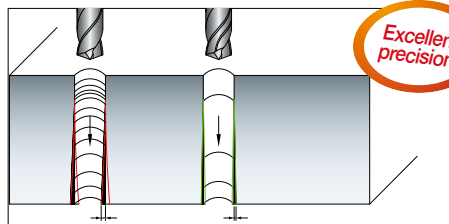
- Ultra fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance
- Longer tool life due to higher wear resistance



[PC315G]

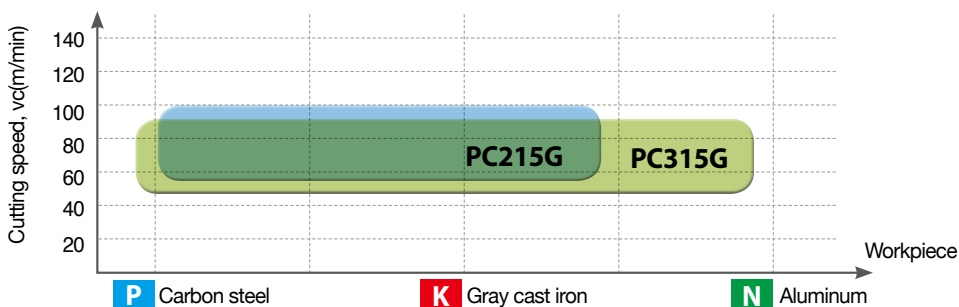
Degree of machining precision

- Improved machining precision
 - Bent holes reduced
 - Inside hole surface roughness improved
 - Hole size uniformity increased
- Improved point shape
 - Precise location secured



[Competitor] [MLD Plus]

▶ Application Area

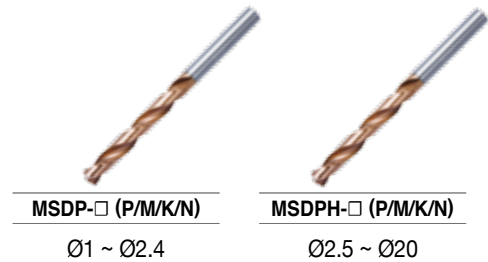


MSD Plus

Mach Solid Drill Plus Highly Efficient for Hole Making

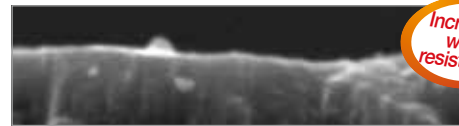
► Features

- Highly efficient hole making for various workpieces including automobile components
- Excellent chip evacuation due to wider chip pockets
- Strong wear resistance due to our new PC325U grade



New grade(PC325U)

- Lubricative coating layer improves welding resistance at middle to high speed
- Increase wear resistance in machining carbon steel

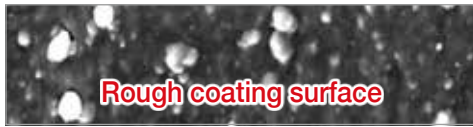


[PC325U]

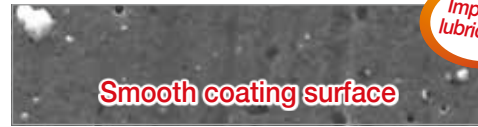
Increased wear resistance

Surface of coating layer

- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



[Competitor]



[PC325U]

Improved lubrication

Chip control

- Workpiece : X5CrNi18-10
- Cutting conditions : $vc(m/min) = 90$, $fn(mm/rev) = 0.2$, $ap(mm) = 30$, wet
- Tools : MSDPH060-5M (PC325U)



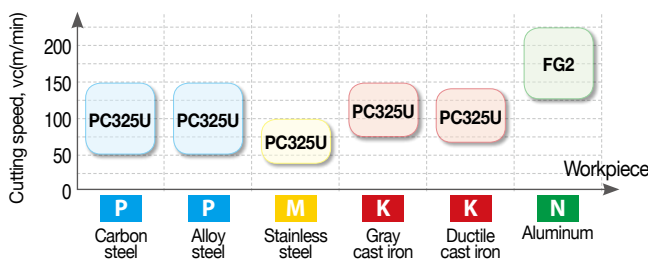
[Competitor]



[MSD Plus]

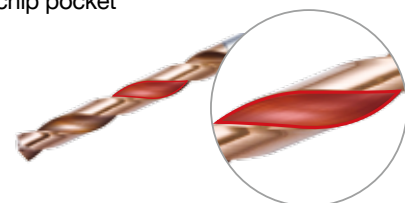
Chips in good shape

Application area



Flute shape

- Improved chip evacuation due to wider chip pocket



Damping Pro

KORLOY Anti-Vibration Tool

► Features

- A special anti-vibration design significantly reduces vibration and shows excellent performance in overhang machining
- Possible to elevate feed compared to standard arbors
- Reduces noise and improves stability
- Provides wide applications for mold making, deep cavity machining and heavy-duty work



- Anti-vibration : Exclusively designed anti-vibration structure
- Material : Special alloy steel
- Anti-vibration body : Application of high density damper
- Overhang : Capable for 2D~5D
- Coolant : Through coolant

- Size : Various types and sizes are applicable



BT Type

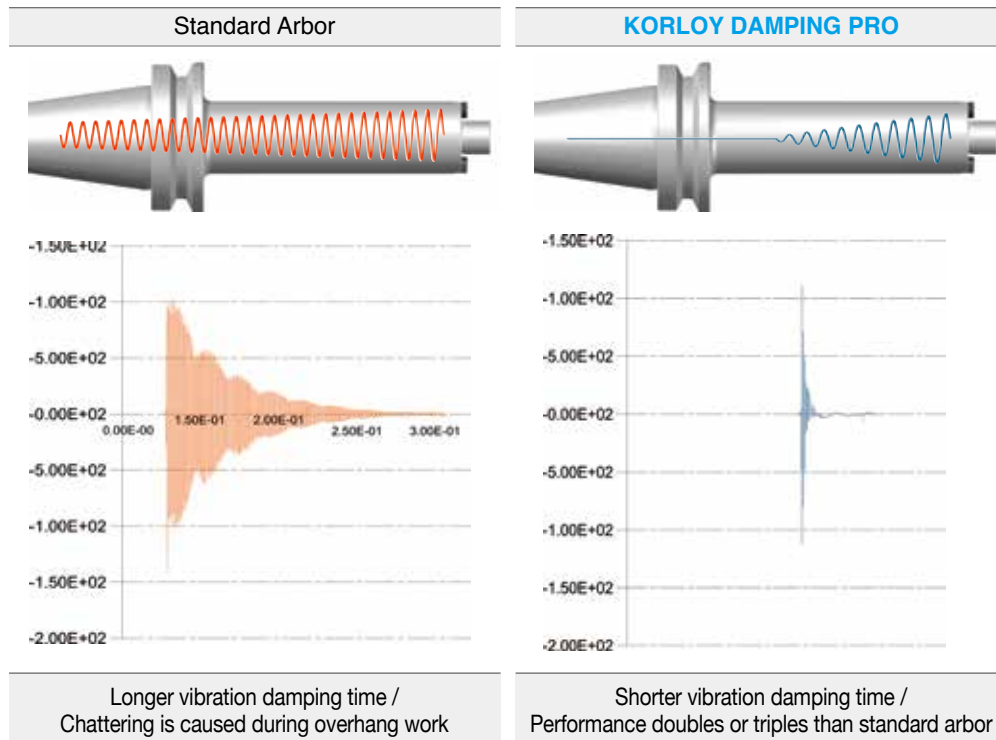


HSK Type



SK Type

► Comparison of Vibration Damping Time



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