

Small Part Machining Solutions

featuring KYOCERA Indexable Tools and SGS Solid Carbide Tools



Increase Productivity with Star Micronics and Kyocera's Latest Tooling Technology

Star Micronics's Featured Machines




SL-7/10



SB-20R type G



SR-20RV



SX-38

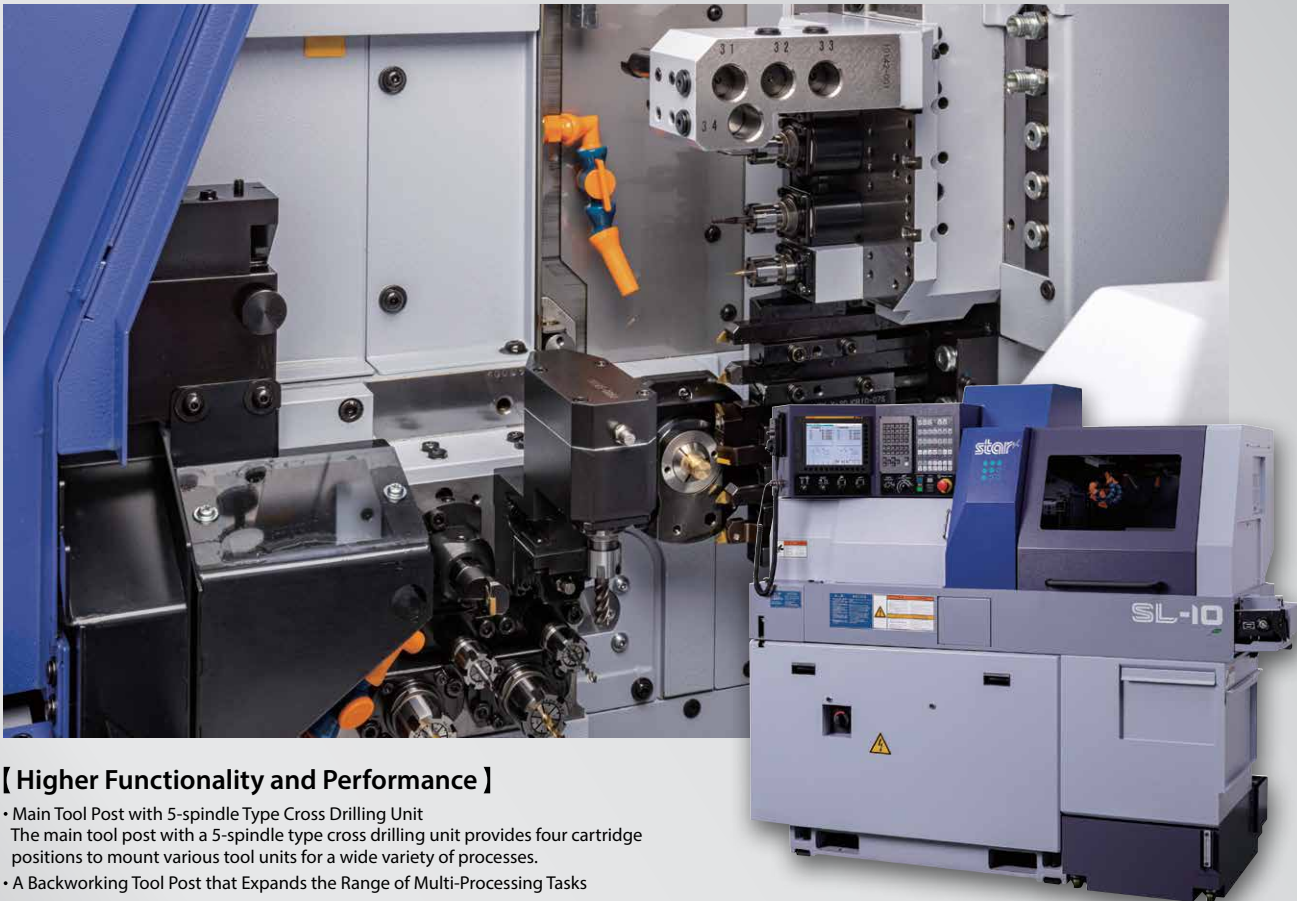
SL-7/10 CNC Swiss Type Automatic Lathe

NEW

High-spec and Compactness

A New Generation Machine Specialized in Small Diameter Processing from Star Micronics

A compact body born from a new design concept, with high specifications to meet the latest needs of small-diameter parts machining



[Higher Functionality and Performance]

- Main Tool Post with 5-spindle Type Cross Drilling Unit
The main tool post with a 5-spindle type cross drilling unit provides four cartridge positions to mount various tool units for a wide variety of processes.
- A Backworking Tool Post that Expands the Range of Multi-Processing Tasks

[Improved Rigidity and Precision]

- Main and Sub Spindles Designed for High Accuracy Indexing
The main spindle with a built-in motor and the belt-driven sub spindle with a built-in sensor ensure high accuracy indexing.
- Mechanism and Structure to Suppress Heat Generation
- Sensors in various parts of the machine enable high accuracy and flexible corrections of thermal displacement.

SL-7/10

SL-7/10

Scan here for machine details

*Link to Star Micronics Website



Featured Product



SKS Chipbreaker

D.O.C. : 0.008" ~ 0.059"

Excellent Chip Control and Finished Surface

Molded Sharp Edge Chipbreaker

Chipbreaker Series for Small Parts Machining

Large Insert Lineup to Solve Various Chip Control Issues
Long Tool Life and Stable Machining with PR1725 / PR1705

- Excellent chip control in a wide range of machining operations
- Anti-welding properties for improved mirror surface finish
- Improved deposition resistance and finished surface

Scan here for
product details



SL-10 Tooling 316L

- Tooling with the latest machines to meet the increasing complexity and variety of small parts
- High-quality and high-precision machining with molded sharp edge chipbreakers

Workpiece Dimension

Material Diameter : $\varnothing 3\text{mm}$
Overall Length : **10.2mm**

Main Spindle

Front Gang Tool Post

①④ T400 External Front Turning

DCGT21505MFP-SKS
(PR1535)
SDJCR1010JX-07FF

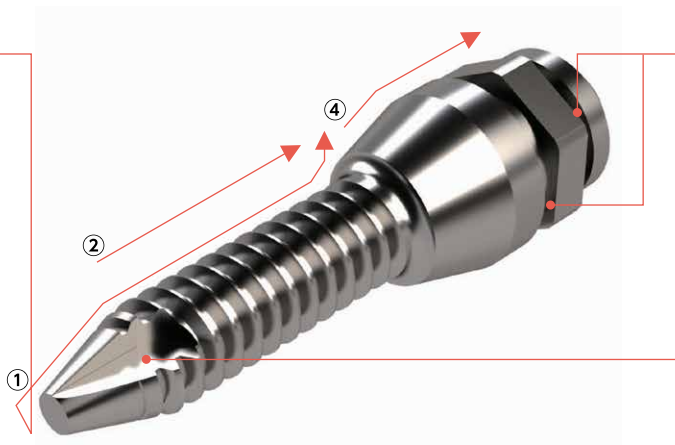


SKS Chipbreaker Molded Sharp Edge Chipbreaker

1st recommendation for finishing
Excellent chip control and high quality
finished surface

② T300 External Threading

TKFT12RA6000
(PR1535)
KTKFR1010JX-12



⑤⑥ T200 External Grooving

GBF32R030-005
(PR1535)
KGBFR1010JX-16F



GBF Grooving Tools for Small Parts

Long tool life and high efficiency machining

Cross Drilling Tool

③ T3100 End Milling

Series 3 2-Flute
Square Endmill $\varnothing 1\text{mm}$



Sub Spindle

⑧ T2500 External Front Turning

DCGT070202MFP-SKS (PR1535)
S16F-SDLCL07



* $\varnothing 16\text{mm} \rightarrow \varnothing 22\text{mm}$ conversion sleeve is used.



⑦ T100 Cut-Off Machining

TKF12L050-S (PR1535)
KTKFL1010JX-12SA

KTKF-S

Toolholder for Sub Spindle

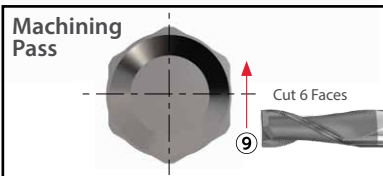
Supports cut-off machining
where the distance between main
spindle and sub spindle is short



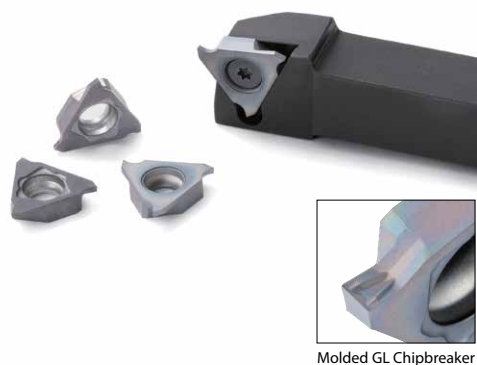
Cross Drilling Tool

⑨ T2100 End Milling

Series 3 2-Flute
Square Endmill $\varnothing 1\text{mm}$



Featured Product



Molded GL Chipbreaker

GBF Series

Grooving Tools for Small Parts Machining

Smooth Chip Control and Excellent Surface Finish
High Precision with Edge Width Tolerance of $\pm 0.02\text{mm}$

- Ideal for groove widths of $0.25\text{mm} \sim 3.00\text{mm}$ and maximum groove depth of 3mm
- Long tool life and high-efficiency machining with MEGACOAT series
- Cermet with excellent surface finish is available
- Molded GL chipbreaker provides superior chip control (groove width $0.75\text{mm} \sim$)

Scan here for
product details



SB-20R CNC Swiss Type Automatic Lathe

This series aims for machining optimizations to perform respective applications through “flexible selection”

A rigid structure to ensure high accuracy and many other functions, which traditionally accompany the SB series, enable response to various needs.



[High Power, High Function and High Accuracy]

- With four types of tool posts and various tool units, a wide variety of complex machining is possible.
- The main spindle/sub spindle is equipped with a C-axis control function as standard.
- A built-in motor is incorporated in the main spindle for improvement of indexing accuracy.

[For High Productivity]

- The 4-spindle backworking unit equipped with a tool rotation drive strengthens complex machining.

[For High Operability and Workability]

- A movable operation panel to be used at the optimum position.

SB-20R type G

SB-20R type G

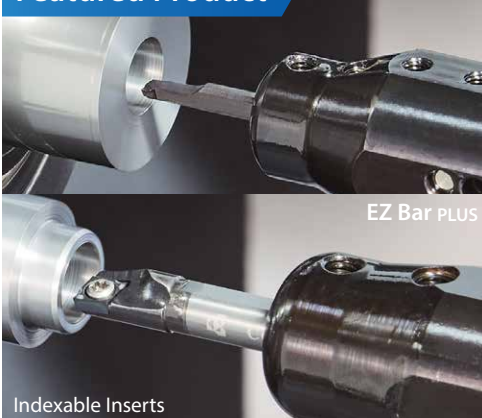
Scan here for machine details

*Link to Star Micronics Website



Featured Product

EZ Bar

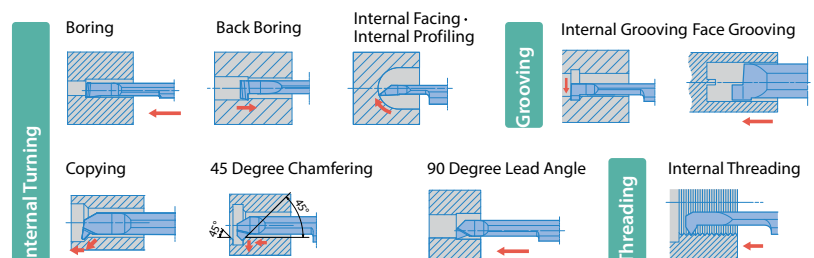


Indexable Inserts

EZ Bar Series Small Internal Machining

Easy Adjustment and High Precision for a Wide Range of Machining Applications

Scan here for product details



SB-20 Tooling 6061

- High-rigidity tool post enables high-precision machining
- Integrating external turning and grooving leads to reduced in cycle time

Workpiece Dimension

Material Diameter : $\phi 15.5\text{mm}$
Overall Length : 60mm

Main Spindle

Front Gang Tool Post

① T200 Grooving/External Turning

TKF12R250-AGT (KPD001)
KTKFR1212JX-12



Molded Chipbreaker PCD Insert

AGT Chipbreaker

Multi-functional PCD insert for grooving and traversing with improved chip control

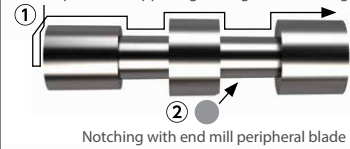
② T3100 Notching (Peripheral Blade)

4FESW100-080-10 (MEGACOAT)



Machining Pass

AGT Chipbreaker supports grooving and traversing



③ T100 Cut-off Machining

GDG2020N-005PG (GW15)
KGDL1212JX-2

Sub Spindle

④ T2400 Drilling (Pilot Hole 1)

DA0880M-FTP (PR1525)
SS10-DRA085M-1.5



High efficiency
replaceable tip drill DRA
FTP for counterboring ensures
high-efficiency machining

⑤ T2300 Drilling (Pilot Hole 2)

Hi-PerCarb® Series 136U
2xD $\phi 9.8\text{mm}$



136U Flat Bottom Drill
New generation flat bottom
drill with eccentric 4-margin
design for improved stability



⑦ T2100 Facing

DCMT32505APD (KPD001)
S22K-SDLCL11



Molded PCD Chipbreaker APD Chipbreaker

Provides good chip control from small
to large D.O.C.

⑥ T2200 Internal Turning/Internal Facing

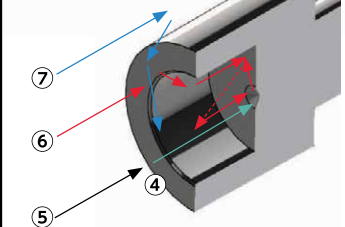
CCGT110905MP-CF (PDL010)
S045X-SCLCR03-050E2P
EZH04516HP-100

Small Internal Machining EZ Bar PLUS

High precision solid bar with
convenience of indexable
inserts reduce
machining costs



Machining Pass



* $\phi 16\text{mm} \rightarrow \phi 22\text{mm}$ conversion sleeve is used.

Featured Product



APD Chipbreaker

AGT Chipbreaker

Molded PCD Chipbreaker

APD and AGT Chipbreakers

Control Chips with Special Molded Chipbreakers Increased Productivity in Aluminum

- Newly developed molded chipbreaker designs
- Improved chip control increases productivity
- Reduces machining downtime due to chip clogging and suppresses quality defects such as cloudy finish

Scan here for
product details



SR-20RIV CNC Swiss Type Automatic Lathe

Impressive Complex Machining to Meet the Needs of Every Field

The most advanced and powerful model in the SR series with upgraded and enhanced functions



【 High Functionality and High Productivity 】

- A maximum of 43 tools to mount in the 29-position tool station ensures a variety of tooling layouts
- B-axis control power-driven tool unit (type B) is programmed to control the angle freely so that simultaneous 5-axis machining is possible.
* Type A is a manual angle adjustment type
- Equipped with Star original motion control system (type B)
Reduces cycle time by minimizing non-cutting time

【 High Rigidity/High Accuracy 】

- A new uniform load cross guide structure for the front tool post
The moment load applied to each guide bearing is minimized and rigidity of tool post is increased.
- Built-in motor drive and built-in sensor for main and sub spindles improved indexing accuracy

SR-20RIV

SR-20RIV

Scan here for machine details

*Link to Star Micronics Website



SR-20RIV Tooling SCM415

- Power-driven tool unit with B-axis supports tooling with complicated shapes such as drilling on slanted surfaces
- Newly developed chipbreakers provides high-quality and high-precision machining results

Workpiece Dimension

Material Diameter : $\phi 12$ mm
Overall Length : 78mm

Main Spindle

Front gang tool post

①⑤ T1100 Grooving/ External Turning/Deburring

TKF16R300-GTP
(PR1725)
KTKFR1212JX-16

KTKF for Small Part Machining Applications

GTP Chipbreaker

Reduce cycle time with grooving and
traversing capabilities
Stable chip control and superior surface finish



③ T1900 Drilling on Slant Surface

Hi-PerCarb® Series 135
3XD $\phi 3.0$ mm



⑦ T100 Cut-off Machining

GDM2020N-020PM (PR1535)
KGDL1212JX-2

Sub Spindle

Backworking tool post

⑧ T2100 External Turning/Facing

DCGT21505MFP-SK (PR1725)
S16F-SDLCL07

Molded Sharp Edge Chipbreaker SK Chipbreaker

Unique chipbreaker
design provides
excellent chip control
Reduces cutting force



* $\phi 16$ mm \rightarrow $\phi 22$ mm conversion sleeve is used.

Cross drilling tool post

② T700 Counterboring

Hi-PerCarb® Series 136U
2xD $\phi 6.5$ mm



136U Flat Bottom Drill

New generation flat bottom
drill with eccentric 4-margin
design for improved stability



④ T1200 Copying

DCGT32505MFP-SKS (PR1725)
SDNCN1212JX-11

Molded Sharp Edge Chipbreaker SKS Chipbreaker

1st recommendation for finishing
Excellent chip control and
high quality finished
surface

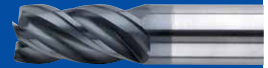


Machining Pass

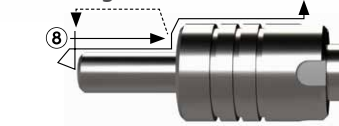


⑥ T800 Notching

Z-Carb Z1M $\phi 3.0$ mm



Machining Pass



⑨ T2200 External Grooving

GBF32R030-005 (PR1215)
S16F-KGBFL16

* $\phi 16$ mm \rightarrow $\phi 22$ mm conversion sleeve is used.

Featured Product



Hi-PerCarb® 136U

NEW! Flat Bottom Drill

- Eccentric style clearance reduces margin contact with the workpiece without reducing strength
- High shear corner geometry minimizes exit bur
- Long tool life with SGS Ti-NAMITE®-X coating and post-coat polishing combine to minimize material adhesion and maximize wear resistance in a wide range of workpiece materials
- Coolant through (146U) styles available

SX-38 CNC Swiss Type Automatic Lathe

The latest model is of the highest quality in all aspects of the 38-dia class.

The new design concept was introduced for all of functionality, rigidity, and workability to meet the needs of machining large-diameter and complex-shaped workpieces.



[Enhanced Functionality]

- In addition to type A, quick-changeable turret-type tool post enabling use of the existing tool units, type B, turret-type tool post with one-position tool drive mechanism is lined up.
- The sub spindle motor which has the same power as the main spindle motor (7.5/11kW) enhances machining capability on the rear side.

[Improved Workability and Operability]

- The layout of the tool post with slanted bed frame greatly improved setup and maintenance workability

[Higher Rigidity and Accuracy]

- The 4-spindle counter face milling unit employ the structure for holding the upper and lower ends. Furthermore, the clamp mechanism is additionally employed to improve the unit's holding rigidity.

SX-38

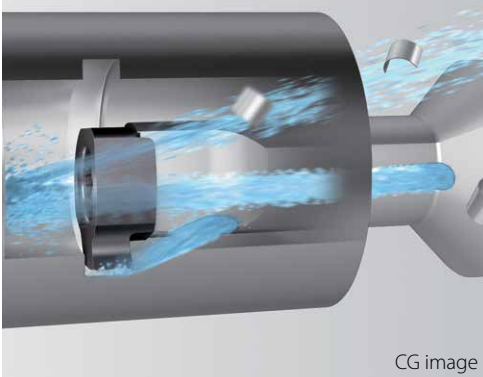
SX-38

Scan here for machine details

*Link to Star Micronics Website



Featured Product



SIGC

High-Precision Small Internal Grooving

Newly Developed Clamping System Ensures a Firm Insert Hold to Provide High-Precision Machining

Excellent Chip Evacuation with Double Coolant Holes and Optimized Flute Shape

- Firm clamping action by pulling the bottom surface of the insert in axial direction
- Superior chip evacuation with double coolant holes
- Large lineup for various internal grooving operations
- Steel and carbide shank bars available
- Long tool life with MEGACOAT NANO PLUS "PR1725"

Scan here for product details



SX-38 Tooling 4137

- Simultaneous machining using gang tool post and turret-type tool post leads cutting time reduction and high efficiency machining
- Tooling with both indexable inserts and solid tools provides a good balance between cost and high precision machining

Workpiece Dimension

Material Diameter : $\phi 35$ mm
Overall Length : 166mm

Main Spindle

Turret-type tool post

① T3100 Drilling

DA0900M-HQP (PR1525)
SS10-DRA090M-1.5

DRA-HQP

Special two-step bottom, large rake angle and double margin design reduce initial shock for higher-precision machining



② T3200 Internal Grooving

GC08R100-005 (PR1725)
SIGCR0812-EH
SHA1222-125

SIGC

An innovative new clamping system ensures a firm hold on the insert to provide high-precision machining capabilities



Gang tool post

⑦ T100 Cut-off Machining

GDM3020N-025PM (PR1535)
KGDR2020K-3T20JCT

JCT Series

Capable of pressure up to 20MPa provides long tool life and improves chip control



Sub Spindle

⑧ T2100 Drilling

DA1370M-HQP (PR1525)
SS14-DRA135M-1.5



⑨ T2500 Internal Profiling

EZBPR060060-015 (PR1225)
EZH06022CT-135



* $\phi 22 \rightarrow \phi 34$ conversion sleeve is used.

External Roughing
(Simultaneous machining)

External Finishing
(Simultaneous machining)

Gang tool post/Turret tool post

③⑥ T3300 External Roughing (Simultaneous machining)

TNMG160404R-LD (PR1725)
DTGMR2020K-16JCT

③⑥ T300 External Finishing (Simultaneous machining)

DCGT32505MFP-SK (PR1725)
SDJCR1625JX11F05JCTM

JCT Series

Supports less piping with direct coolant supply
Large lineup for various tooling operations
Superior chip control and long tool life

Tool post for power-driven tool

④ T1100 Keyway Milling

Series 3 2-Flute
Square Endmill $\phi 6$ mm



Turret/Tool post for power-driven tool

⑤ T3400/T1200 8 Sides Cut (4 Sides x 2 Simultaneous machining)

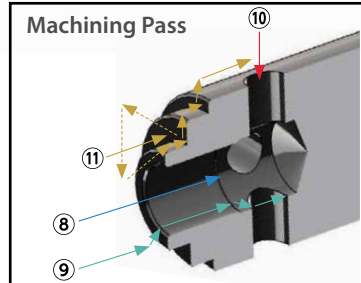
Z-Carb-AP
Z1MPCR (Ti-NAMITE®-X)



(Simultaneous machining)

(Simultaneous machining)

Machining Pass



⑩ T2200 Cross Drilling

Hi-PerCarb® Series 135
3XD $\phi 8.0$ mm



⑪ T2700 External Facing

DCGT11T302MFP-SK (PR1725)
S22K-SDLCL11

* $\phi 22 \rightarrow \phi 34$ conversion sleeve is used.

Featured Product



DRA Magic Drill

High Efficiency Replaceable Tip Drill

Excellent Hole Accuracy with a Low Cutting Force Design

- Low cutting force design improves hole accuracy
- Optimal web thickness limits deflection
- Easy insert replacement
- 4 Insert tip designs for various applications

Scan here for product details



General Use
GM



Counterboring
FTP



High Precision for
Steel Machining
HQP



High Precision for
Difficult-to-cut Materials
HQS

Kyocera New Products for Small Parts Machining

- New PVD coating provides long tool life and excellent surface finish
- Molded sharp edge chipbreaker for superior chip control
- Direct jet coolant-through holders for small parts machining

PR1725

PVD Coated Carbide

1st Recommendation for Steel Machining

Excellent Surface Finish and Long Tool Life

Great Performance in Small Parts Machining Applications

Website



1 MEGACOAT NANO PLUS maintains long tool life and excellent surface finish

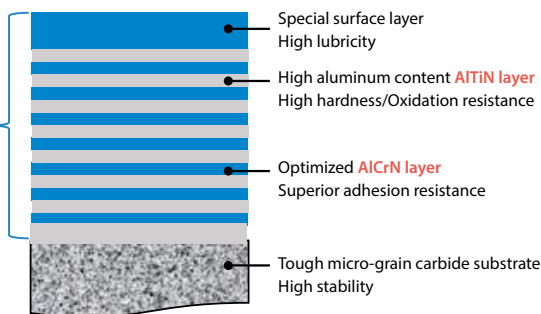
MEGACOAT NANO PLUS

AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance.

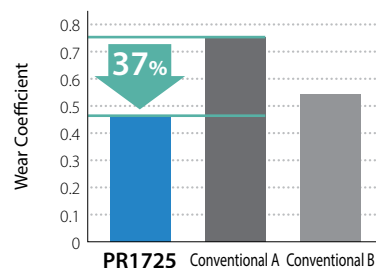
Excellent surface finish and long tool life.

REDUCES CRACKING

Reduces abnormal damage such as chipping because of increased lamination layer with a thinner gap than conventional coatings



Wear Coefficient Comparison (Internal Evaluation)

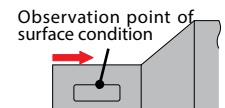


2 One solution for various workpiece materials

Long tool life for steel, stainless steel and free-cutting steel

Improved management of tools cut the cost

Wear on the cutting edge of insert and quality of the surface finish comparison (Stainless Steel: 304)
(Internal Evaluation)

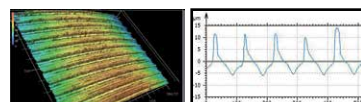
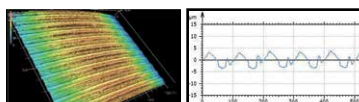
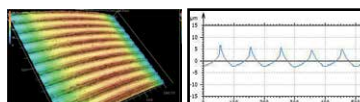


Cutting Conditions : $V_c = 490 \text{ sfm}$, $D.O.C. = 0.020''$,
 $f = 0.004 \text{ ipr}$, Wet
Workpiece : 304

Cutting edge condition (Nose)



Computer generated surface finish measurement and wave form



Maintain normal waveform

Tear

Distorted by tearing

Tear

Distorted by tearing

PR1725 shows less damage on the cutting edge and maintains stable finish results on the workpiece surface

Molded Sharp Edge Chipbreaker

Molded Chipbreaker Series for Small Parts Machining

Extensive Lineup to Solve Various Chip Control Issues

Utilizing PR1725 and PR1705 Provides Stable Machining and Extended Tool Life

1st Recommendation for Finishing

SKS Chipbreaker

D.O.C.: 0.008" to 0.059"

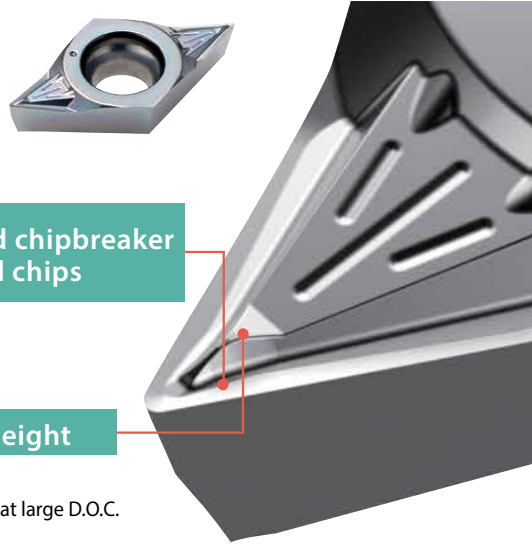
Excellent Chip Control and Surface Finish

Rake face, bottom face, and chipbreaker face ensure properly curled chips

Optimized chipbreaker height

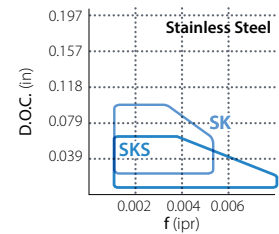
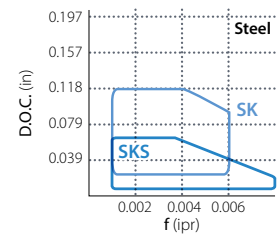
Stable chip control at high feed rate

Improved chip evacuation when machining at large D.O.C.



Chipbreaker Map

1st Recommended Chipbreaker (Low resistance type)





KYOCERA Precision Tools

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Hendersonville, NC 28792

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Technical Support | 800.823.7284 - Option 2



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