



Small Part Tooling Solutions



FEATURED PRODUCTS

**Molded Sharp Edge
Chipbreakers**



Large Lineup Providing
Excellent Chip Control

**EZ Bar Series
Small Diameter Boring**



Excellent Repeatability
Easy Positioning Indexable
Type Available

**KGBF / KGBF-JCT
Shallow Grooving**



GL Molded Chipbreaker
Provides Stable Chip Control
(JCT Coolant-Through Style Available)

**KGD / KGD-JCT
Small Parts Cut-Off**



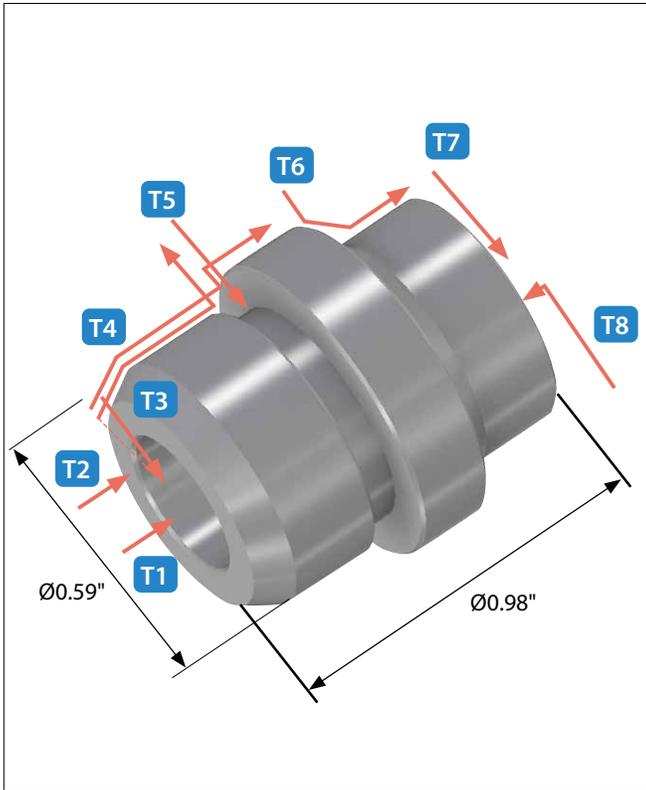
Large Lineup for Various
Workpiece Materials
(JCT Coolant-Through Style Available)

**KTKF / KTKF-JCT
Cut-Off, Turning,
Grooving, Threading**



Excellent System for High-Precision
Cut-Off and Various Other Applications
(JCT Coolant-Through Style Available)

Machining Demonstration for Auto Part Tooling for Injection Core (304)



Introduction

It can be difficult to control chips when machining 304 stainless steel. Due to the number of machining operations required, it is important to optimize the selection of tooling to improve productivity.

Our Tooling Advantages

- 1) Stable chip control with molded chipbreakers
- 2) Sharp cutting edge for high-quality surface finish
- 3) Excellent surface finish in steel Swiss applications "PR1725"
- 4) Long tool life with heat-resistant coated carbide "PR1535"

Insert Grade Selection

Kyocera's **PR1725** and **PR1705** MEGACOAT NANO PLUS insert grades with superior high temperature properties and oxidation resistance maintain ideal performance in steel, stainless steel and free-cutting steel.

Use **PR1535** MEGACOAT NANO insert grade as our first recommendation for stainless steel machining. Achieve long tool life and stable machining results with the combination of a tough substrate and a specialized Nano coating layer.

T1 P4

DRA

High precision and high efficiency machining with the DRA replaceable insert tip drill

SS10-DRA080M-3
DA0800M-GM PR1535

Cutting Conditions
Vc = 230 sfm
f = 0.003 ipr



T2 T8 P5/P10

EZ Bar Series

Lineup from high precision adjustable solid bars to easy indexable type

T2 EZH07019CT-120
C06X-SCLCR04 - 070EZ
CCGT141105MP-CF PR1535

T8 EZH06019HP-120
EZVBR065060-010 PR1225

Cutting Conditions
Boring (EZ Bar PLUS: Indexable type)
Vc = 197 sfm, D.O.C. = 0.0098"
f = 0.0016 ipr
Back Facing (EZ Bar)
Vc = 197 sfm, D.O.C. = 0.008"
f = 0.0020 ipr



T3 T4 P6

Molded Sharp Edge Chipbreakers

Molded chipbreaker combines sharpness and superior chip control

T3 SCLCR1212JX-09FF
CCGT3251MFP-GQ PR1535

T4 SDJCR1216JX-11-F15
DCGT32505MFP-SK PR1535

Cutting Conditions
Roughing (SK Chipbreaker)
Vc = 230 sfm, D.O.C. = 0.008" - 0.098"
f = 0.004 ipr
Finishing (GF Chipbreaker)
Vc = 262 sfm, D.O.C. = 0.020"
f = 0.003 ipr



T5 P7

GBF GL Chipbreaker

Molded chipbreaker maintains smooth chip control

KGBFR1212JX-16F
GBF32R100-005GL PR1535

Cutting Conditions
Vc = 262 sfm
f = 0.003 ipr
Grooving Depth : 0.118"



T6

▶▶ P8

TKFB GQ Chipbreaker

Tool for back turning with molded chipbreaker provides efficient single-pass machining results

KTKFR1212JX-12
TKFB12R28005-GQ PR1535

Cutting Conditions

Grooving:
Vc = 260 sfm
D.O.C. = 0.012"
f = 0.0008 ipr

External Turning:

Vc = 260 sfm
D.O.C. = 0.118"
f = 0.0024 ipr



T7

▶▶ P9

KGD for Small Parts Machining

Good chip control at low feed rates

KGDSR1616JX-2B
GDM2020N-015PF PR1535

Cutting Conditions

Vc = 260 sfm
f = 0.002 ipr



PR1725 MEGACOAT NANO PLUS

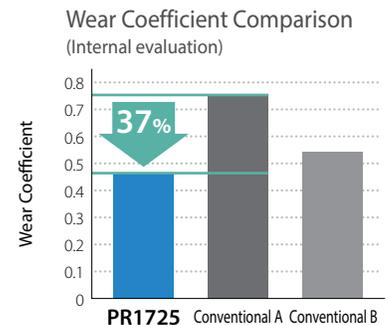
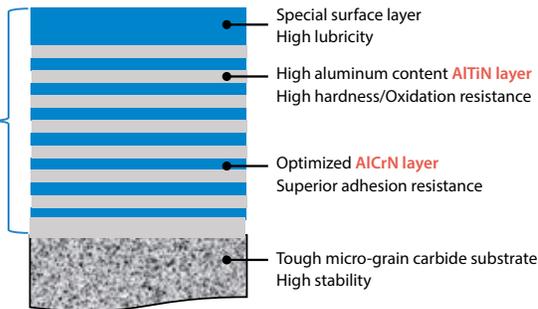
1st Recommendation for Steel Machining
Excellent Surface Finish and Long Tool Life
Great All-Around Performance in Small Parts Machining Applications

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



Superior Wear and Chipping Resistance

High Strength with nano laminated film layer properties
Internal stress optimization reduces chipping

Excellent Surface Finish

Special surface layer with great lubricity reduces adhesion

Applicable to Various Workpiece Materials

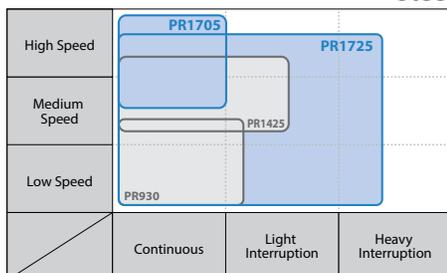
Superior high temperature properties and oxidation resistance make for great performance in steel, stainless steel and free-cutting steel

High Machining Stability

Tough micro-grain carbide substrate provides stable machining

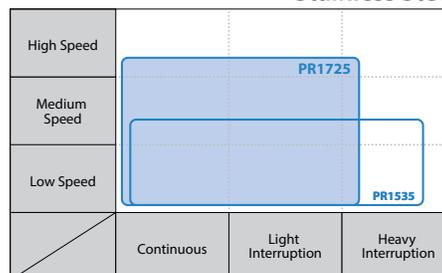
Great performance in both steel and stainless steel from low to high speed machining

Steel



PR1725 : 1st Recommendation for Steel

Stainless Steel



PR1725 : For general purpose high-speed machining

PR1535 : 1st Recommendation for stainless steel machining with long tool life and high-quality surface finish

PR1705 MEGACOAT NANO PLUS

High-hardness ultra-fine particle carbide substrates with MEGACOAT NANO PLUS offer excellent wear resistance and high precision machining

Insert Wear and Surface Finish Comparison (1215) * After 40 min of machining (Internal evaluation)



PR1705

Cutting Edge (Flank Face)

Wear
(Substrate exposure)

Workpiece *CCD image

Good surface finish

Tearing on Workpiece (Surface Finish Enlarged)

Small Tearing

Competitor K

Cutting Edge (Flank Face)

Wear
(Substrate exposure)

Workpiece *CCD image

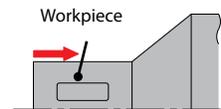
Tearing on Workpiece (Surface Finish Enlarged)

Large Tearing

PR1705 showed little adhesion to the cutting edge and good surface finish on the workpiece without tearing

Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.0197", f = 0.0020 ipr, Wet Workpiece : 1215

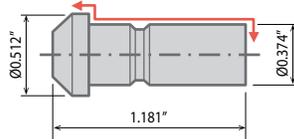
PR1705 improved tool life in continuous machining for steel and electromagnetic soft iron *For more stable machining, use PR1725



Case Studies

Pin 12L14

Vc = 660 sfm
D.O.C. = 0.0047"
f = 0.0016 ipr
Wet
CCGT32502MF PR1705



Tool Life

PR1705 MF Chipbreaker

4,800 pcs/edge

Tool Life
↑
x1.5

Competitor L
(Ground chipbreaker)

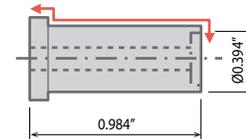
3,200 pcs/edge

PR1705 MF chipbreaker showed 1.5 times longer tool life when compared to competitor L

(User Evaluation)

Shaft 12I14

Vc = 330 sfm
D.O.C. = 0.051"
f = 0.0020 ipr
Wet
DCGT32505MFR-J PR1705



Tool Life

PR1705 J Chipbreaker

5,800 pcs/edge

Tool Life
↑
Approx. x1.4

Competitor M
(Ground chipbreaker)

4,000 pcs/edge

PR1705 J chipbreaker showed 1.5 times longer tool life when compared to competitor M

(User Evaluation)

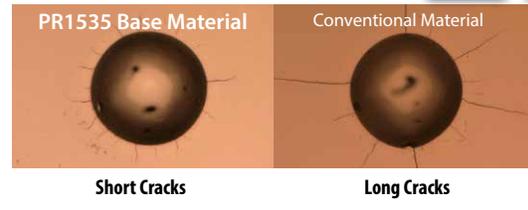
PR1535 MEGACOAT NANO

The combination of tough substrate and special nano layer coating enables long tool life and stable machining of steel, stainless steel and heat-resistant alloys

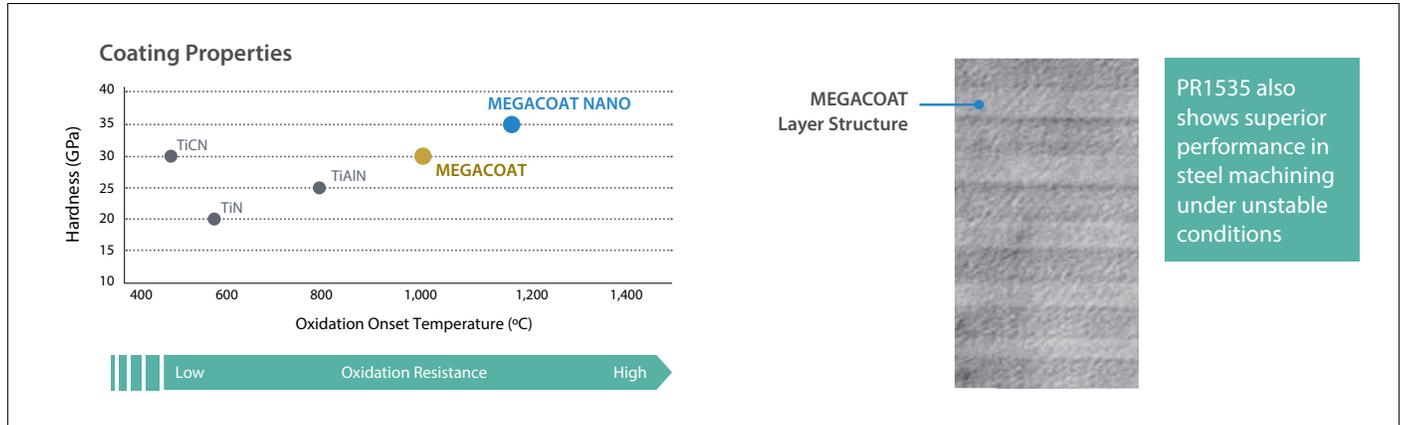
[Product Brochure](#)
[Product Video](#)
[View Online](#)

- 1 An increase in cobalt content yields a substrate with greater toughness.
- 2 Fracture toughness values are improved by 23% over previous grades.

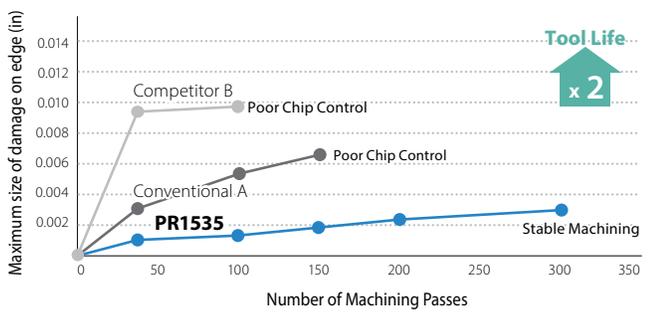
Cracking Comparison by Diamond Indenter (Internal Evaluation)



Shock Resistance

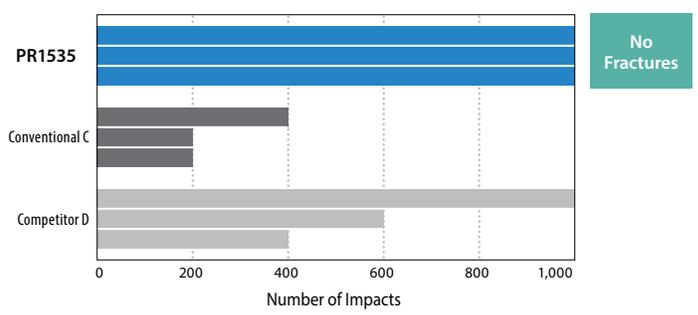


Wear Resistance Evaluation (Internal Evaluation)



Cutting conditions : n = 1,273 rpm (Vc = 262 sfm), f = 0.0015 ipr, Wet (Oil-based)
Workpiece : 304 (Ø20mm)

Fracture Resistance Evaluation (Internal Evaluation)



Cutting conditions : n = 509 rpm (Vc = 262 sfm), f = 0.0047 ipr, Wet (Water Soluble)
Workpiece : 304

*Evaluated with KGD



Issues

Modern high precision machining requires tight coaxiality and circularity tolerances, which can be difficult to achieve.

Solution

It is important to select a drill with low cutting force. The DRA drills provide excellent hole accuracy with a low cutting force design.

Lineup includes a minimum cutting diameter $\varnothing 0.313"$ and 1.5D drill body which is great for small part machining applications.

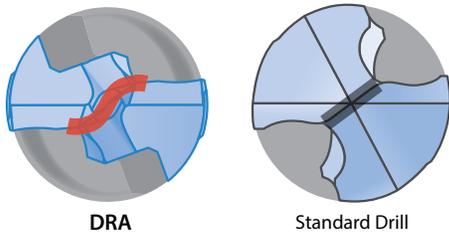


1.5D Depths Available

1 Low Cutting Force Design Improves Hole Accuracy

Special chisel edge with S-curve reduces thrust force and controls vibration

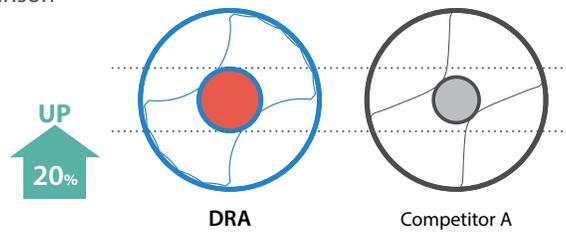
Cutting Edge Image



2 Optimal Web Thickness Limits Deflection

Special chisel edge with S-curve reduces thrust force and controls vibration

Web Thickness Comparison



Roundness · Cylindricity Comparison (Internal Evaluation)

	DRA	Competitor D	Competitor E
Roundness	18.7 μm	31.1 μm	27.3 μm
Cylindricity	23.6 μm	34.3 μm	30.1 μm

Cutting Conditions : Vc = 390 sfm, f = 0.012 ipr
Drilling Diameter $\varnothing 0.551"$, Measurement Position 2.165", Wet Workpiece : 1049 Steel



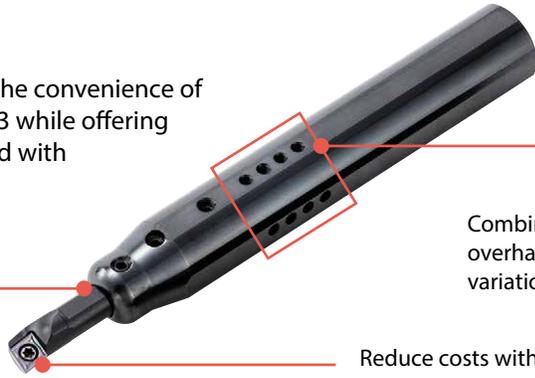
Issues

Changing tools while boring can be tedious, and often sacrifices repeatable accuracy.

Solution

EZ Bar's High Precision Solid Bar gives you the convenience of indexable inserts, cutting set-up time by 2/3 while offering higher repeatability and accuracy compared with conventional boring bars.

Carbide shank and steel shank available



Combining the sleeve with adjustable overhang length prevents dimensional variation and reduces set up time

Reduce costs with changeable, indexable inserts

1 Minimum Boring Diameter : Ø5mm

Carbide type and Steel type are available for various applications



Carbide Type

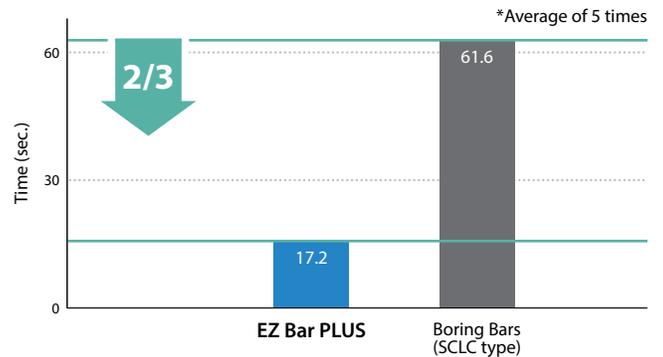


Steel Type

2 Shorten Time of Insert Change by 2/3

EZ Adjust Structure enables drastic shortening of the setting time compared to conventional boring bars.

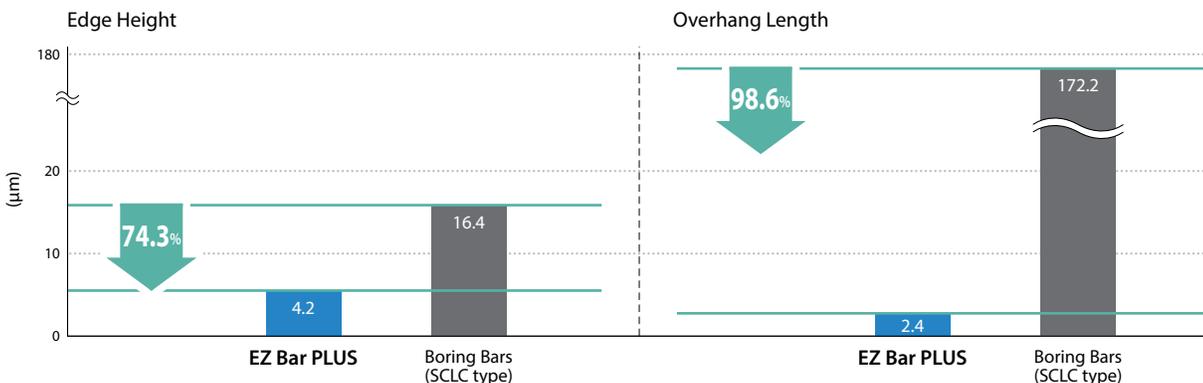
Insert Change Time (Internal Evaluation)



3 Superior Repeat Accuracy

EZ Adjust structure achieves better repeat accuracy than standard boring bars.

Repeat Accuracy Comparison (Internal Evaluation)





Issues

Continuous operation of small tool machines requires maintenance free operation. Poor chip control can lead to chip entanglement, poor surface finish, and decreased tool life.

Solution

Kyocera's molded sharp edge chipbreakers allow for precise control in small part applications. Improve chip control, surface finish, and increase tool life by selecting the right chipbreaker for your job from Kyocera's extensive chipbreaker lineup.

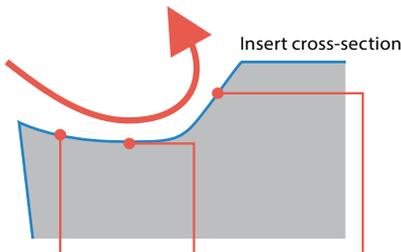
1st Recommendation for Finishing

SKS Chipbreaker

D.O.C.: 0.008" to 0.059"
Corner-R (RE) down to 0.002" (Minus Tolerance)
Excellent Chip Control and Surface Finish



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



Rake Face Bottom Face Chipbreaker Face

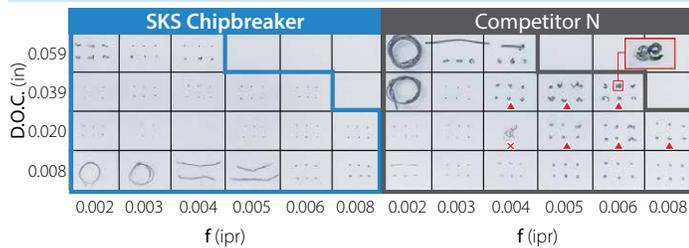


Optimized Chipbreaker Height

Stabilized chip control when machining at high feed rates
Improved chip evacuation when machining at large D.O.C.

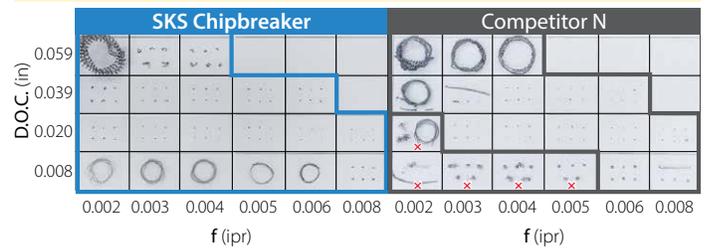
Chip Control Comparison (Internal evaluation)

1045



▲ : A little Unstable Chip Control ✗ : Unstable Chip Control

304



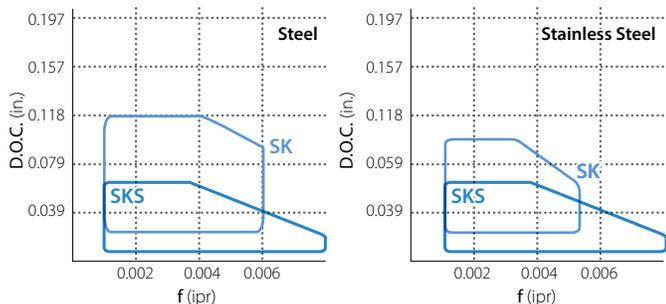
✗ : Unstable Chip Control

Cutting Conditions : Vc = 330 sfm, Wet, DCGT32505 Type

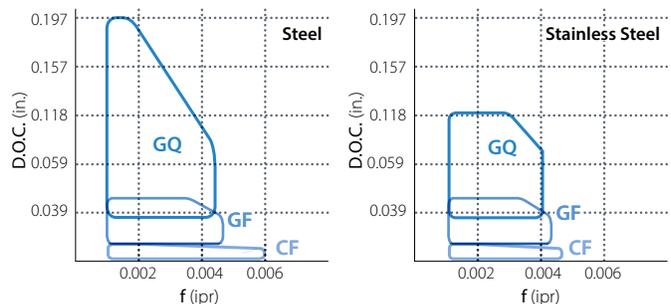
SKS chipbreaker showed greater chip control when compared to competitor N

Chipbreaker Map

1st Recommendation for Finishing (Low Cutting Force)



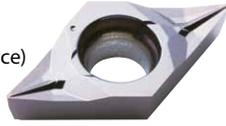
Complementary Chipbreakers (Chip Control Oriented)



1st Recommendation for Semi-finishing

SK Chipbreaker

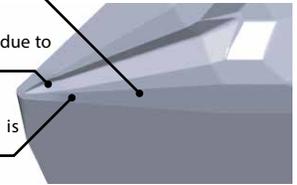
D.O.C.: 0.0197" to 0.118"
 Corner-R (RE) down to 0.004" (Minus Tolerance)
 The molded chipbreaker maintains both sharpness and chip control



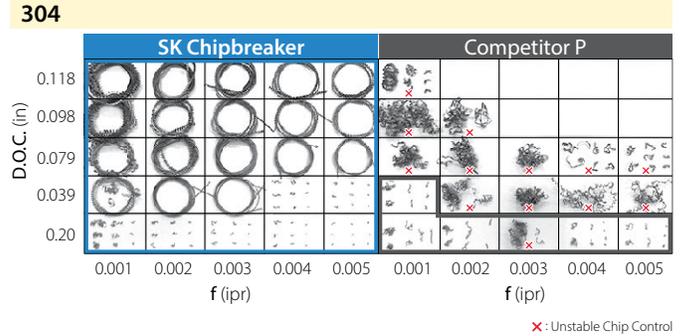
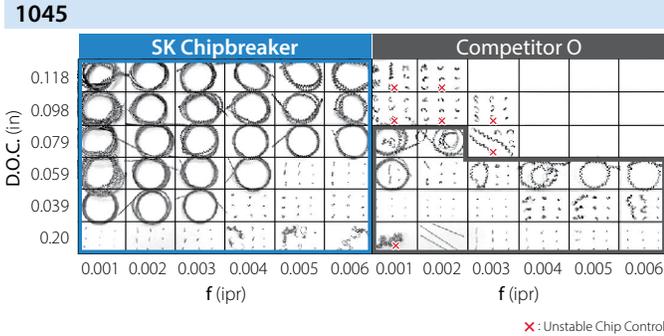
Stable chip evacuation in large D.O.C.
 due to large rake angle

Chip control is improved in small depths of cut due to chipbreaker projecting out to the corner tip

Cutting force is reduced as the cutting edge is lowered towards the center of the workpiece



Chip Control Comparison (Internal evaluation)



Cutting Conditions : Vc = 330 sfm, Wet, DCGT32505 Type

Additional Chipbreakers (Chip Control Oriented)

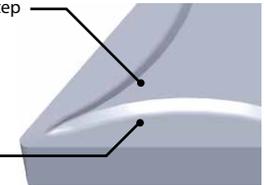
GQ Chipbreaker for Small to Large D.O.C.

D.O.C.: 0.003" to 0.197" (Steel)
 0.003" to 0.118" (Stainless Steel)
 Corner-R (RE) down to 0.004" (Minus Tolerance)
 Great for a wide range of applications



Low cutting force design with a small chipbreaker step
 Good chip control in small depths of cut with the breaker dot projecting out to the cutting edge

Wide range of acceptable chips is achieved by using an advanced chipbreaker design



GF Chipbreaker for Finishing

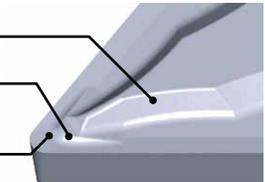
D.O.C.: 0.010" to 0.050"
 Corner-R (RE) down to 0.004" (Minus Tolerance)
 Controlled chips during finishing



High slope recedes away from the cutting edge
 ⇒ Minimizes chip clogging in large D.O.C.

Improved sharpness with large rake angle

Chipbreaker dot extends out to the cutting edge
 ⇒ Divides the chips into smaller pieces



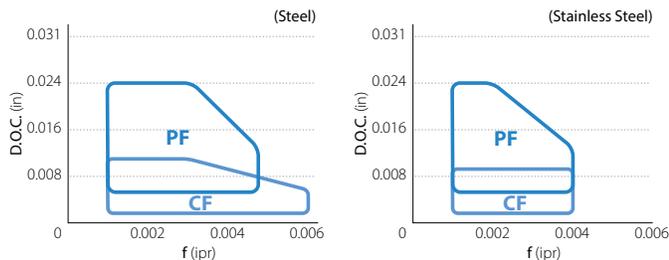
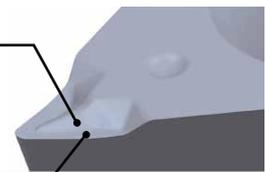
PF Chipbreaker for Micro Boring and Small D.O.C.

D.O.C.: 0.005" to 0.024"
 Corner-R (RE) down to 0.004" (Minus Tolerance)
 Superior chip control in micro boring applications
 (Minimum cutting diameter Ø5mm~)

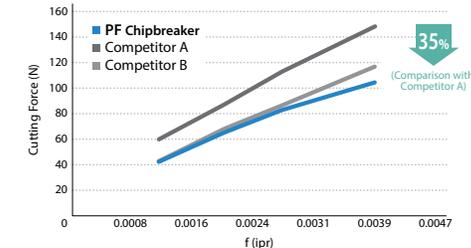


Optimized edge design excellent chip control in a wide range of cutting conditions and micro boring applications

Large rake angle and sharpened cutting edge reduces cutting forces



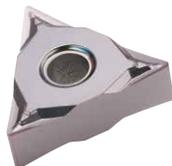
Cutting Force Comparison (Internal Evaluation)



Small Double-Sided Tooling for workpieces larger than Ø.63" / Lineup from 0.0039" Corner-R (minus tolerance)

SK Chipbreaker : Finishing ~ Medium

Useful chipbreaker for both sharpness and superior chip control



TK Chipbreaker : Medium ~ Roughing

Supports a wide range of cutting conditions with low cutting force design





Issues

Typical ground chipbreakers failure to control chip size can lead to chip entanglement on the workpiece.

Solution

The GBF GL molded chipbreaker improves chipbreaking capabilities allowing for precise and reliable grooving and traversing.



1 Excellent Chip Control Performance

Compared to ground chipbreakers, molded chipbreakers have more precise chip control.

GBF GL Chipbreaker			
Competitor J (Ground Chipbreaker)			
Competitor K (Ground Chipbreaker)			

f = 0.0020 ipr f = 0.0024 ipr f = 0.0028 ipr
Workpiece : 1045

2 Traversing Supported

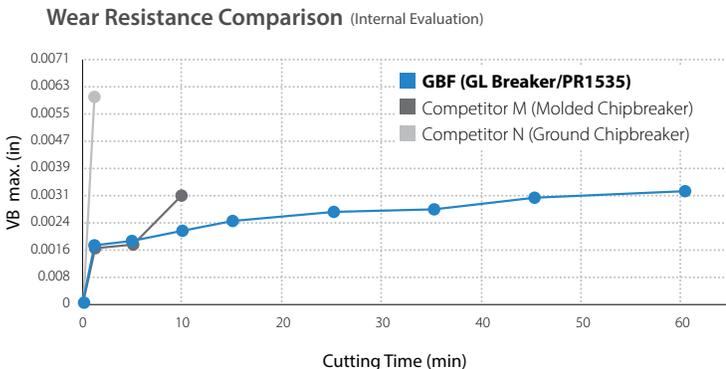
Excellent Chip Control for Various Applications

GBF GL Chipbreaker		
Competitor L (Molded Chipbreaker)		

f = 0.0008 ipr f = 0.0012 ipr
Workpiece : 1045

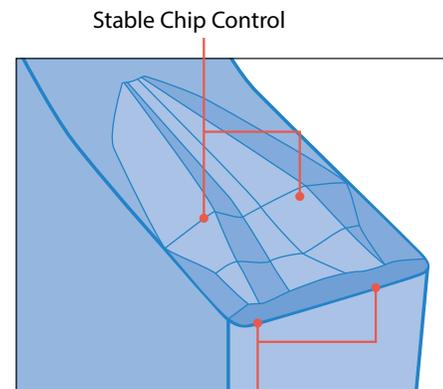
3 Long and Stable Tool Life

Fracture Resistant Cutting Edge Design for Stable Machining



Cutting conditions : 197 sfm, f = 0.0016 ipr
Workpiece : 304

Twin-bump Chipbreaker Design



Chips are short, curled and broken evenly in low feed machining operations to prevent chip crumpling



Issues

Poor chip control can lead to work-hardened chips jamming between the work surface and the cutting tool. This can lead to inserts chipping out and not lasting through continuous machining cycles.

Solution

The **TKF-GTP and TKFB-GQ Molded Chipbreakers** allow for single-pass machining with both excellent surface finish and chip control for reliable continuous operation.

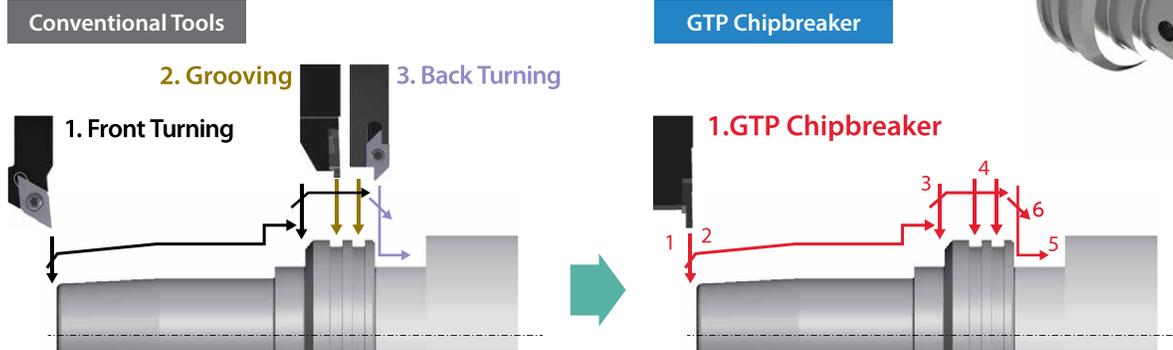


GTP Chipbreaker

Reduce Cycle Time with Grooving and Traversing Capabilities

Integrated Tooling Solution

The GTP chipbreaker can be used for external turning, grooving, and back turning operations



* Max. Grooving Width / Max. D.O.C. = TKF12R200-GTP (2.0mm / 4.0mm), TKF16R300-GTP (3.0mm / 5.5mm)

GQ Chipbreaker

Achieve Single Pass Machining with TKFB-GQ Back Turning Inserts

Surface Roughness of Flange Surface Comparison

D.O.C.	0.157"	0.118"	0.079"
GQ Chipbreaker	Rz = 2.63µm	Rz = 2.92µm	Rz = 2.41µm
Competitor O (Ground Chipbreaker)	Rz = 27.88µm	Rz = 31.23µm	Rz = 25.56µm

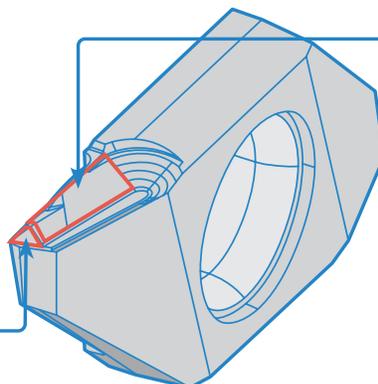
Cutting conditions : Vc = 330 sfm, f = 0.0008 ipr, Wet Workpiece : 1045

Features of the GQ Chipbreaker:

Grooving Superior Surface Finish

Prevents chip jamming

GQ Chipbreaker	Competitor P (Ground Chipbreaker)
(Internal Evaluation)	



External Stable Chip Control

Prevents Chip Entanglement

GQ Chipbreaker	Competitor Q (Ground Chipbreaker)
(Internal Evaluation)	



KTKF Series

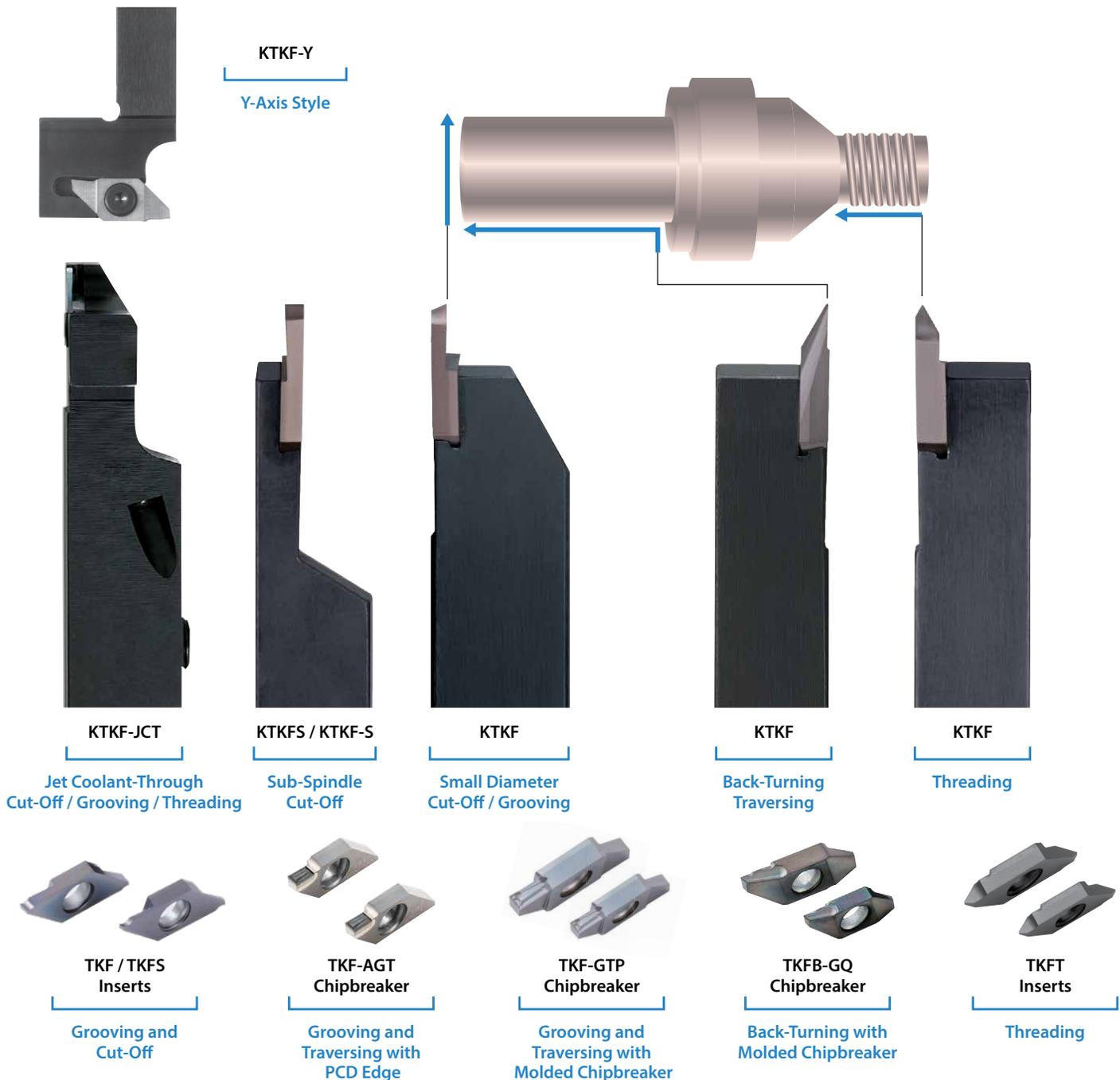


Small Diameter Cut-Off, Grooving, Traversing, Back Turning, and Threading
 Exceptional Chip Control and Tool Life

Large Tooling Lineup for Various Small Part Machining Operations

Wide range of machining processes and applications including small diameter cut-off, grooving, traversing, back turning, and threading

Full compliment of holder designs to choose from for every machining operation





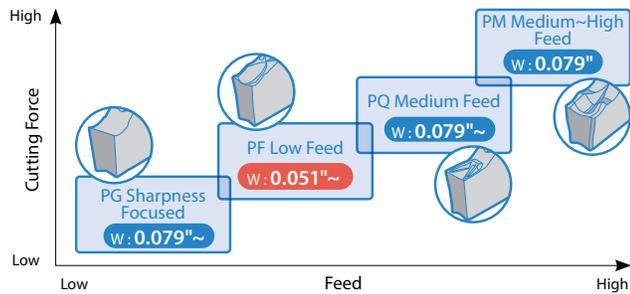
Issues

Parting off across the center where cutting speeds drop to zero can lead to short tool life.

Solution

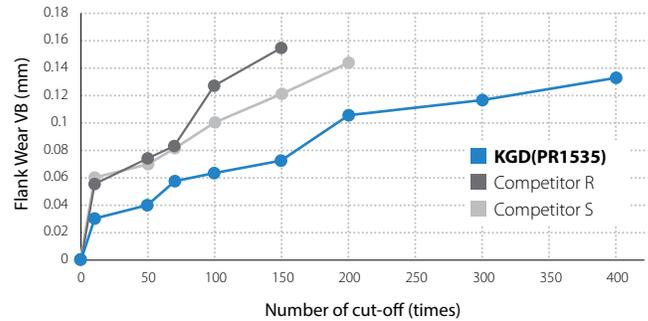
Use the KGD Grooving and Cut-off system combined with the PR1535 insert grade, special chipbreakers, and an improved ridged clamping system for long tool life and reliable operation. Now available in JCT Jet Coolant-Through styles.

1 Wide Chipbreaker Lineup for Various Machining Application



2 Long and Stable Tool Life

Wear Resistance Comparison (Internal Evaluation)

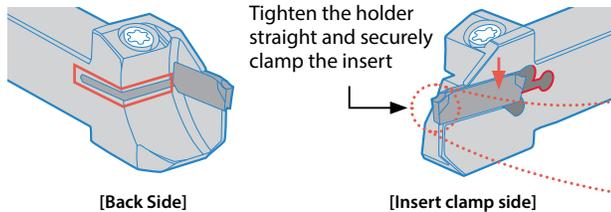


Vc = 197 sfm, f = 0.0016 ipr, (0.0008ipr from 0.197" to the center)
Wet Workpiece = 304

3 Increased Clamping Strength

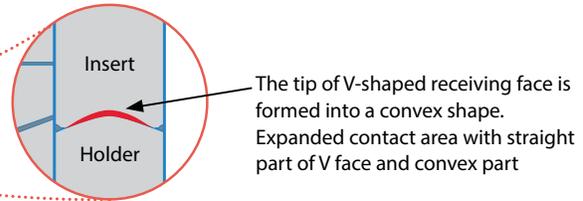
New Slit Shape

Increased clamping force by tightening the insert on clamp side



V-shaped Receiving Face with Convex tip

Increasing the contact area between insert and holder allows for a tighter fitting insert which increases clamping strength



Clamping strength (Traversing)
(Internal Evaluation)

Cutting conditions : Vc = 262 sfm, D.O.C. = 0.039"~0.118", f = ~ 0.012 ipr,
Wet (Oil-based) Workpiece : W1-9 (Ø0.39")

D.O.C.	0.039"		0.059"		0.079"		0.118"	
f	0.010 ipr	0.012 ipr	0.010 ipr	0.012 ipr	0.010 ipr	0.012 ipr	0.010 ipr	0.012 ipr
KGD	Stable Machining							X
Competitor T	Stable Machining		X		Stable Machining			
Competitor U	Stable Machining		X		Stable Machining			



Issues

Multiple Tools and sleeves are often required for Turning, Boring, Grooving, and Threading.



Solution

EZ Bar system uses an easily adjustable coolant through sleeve which now fits a variety of inserts to handle turning, boring, grooving and threading jobs.

1 Wide Lineup

Internal Turning

H Chipbreaker
(Parallel ground chipbreaker)

F Chipbreaker
(With lead angle)

NB
(without chipbreaker)

Internal copying
(EZVB)



Machining allowance:
0.2mm or more

Machining allowance:
0.2mm or less

1st Recommendation/General Purpose
Applicable to long overhang
(Description:..HP...LT)
Uncoated (GW05) available

For finishing/Sharp cutting

For Non-ferrous metals
PCD and CBN available

Grooving, Threading

Internal Grooving
(EZG)

Face Grooving
(EZFG)

Threading
(EZT)



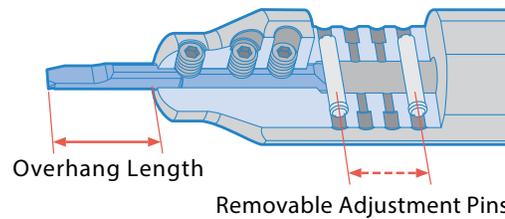
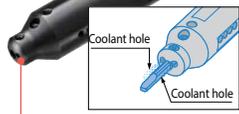
Minimum Diameter
Ø3mm
Applicable to M4
Metric Thread

How to select sleeves

EZH-CT
Adjustable overhang
length with
coolant hole

EZH-HP
Adjustable overhang
length

EZH-ST
Fixed overhang
length



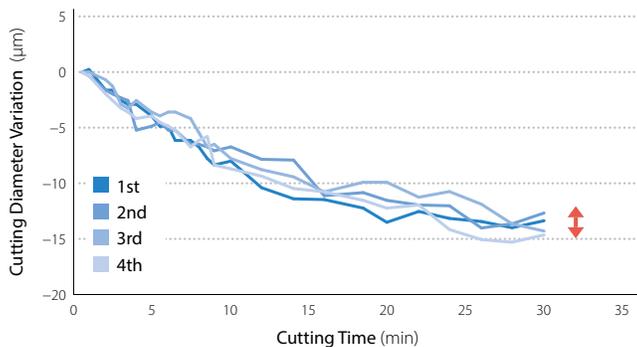
Special end-face shape of all 3 types enable smooth coolant supply

2 Reduce Dimensional Variation

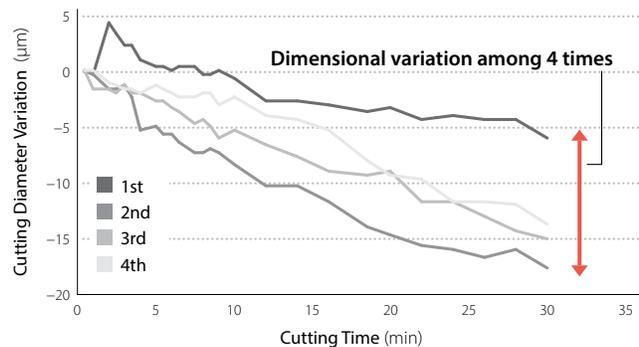
Excellent clamping force is attained by the bars ability to be tightened with a moveable adjustment pin, which also prevents the bar from rotating during cutting.

Cutting Diameter Variation Comparison (Internal Evaluation)

EZ Bars



Competitor V

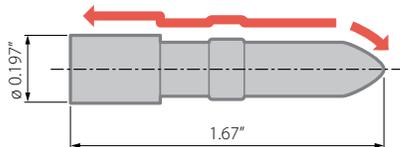


Cutting conditions : Vc = 217 sfm, D.O.C. 0.004", f = 0.0008 ipr, Wet (Oil-based) Workpiece : W1-9

Turning Molded Sharp Edge Chipbreaker for Small Parts

Pin: 17-4 PH

Vc = ~180 sfm (n = 3,600 RPM)
D.O.C. = 0.004" ~0.028"
f = 0.001 ipr
Wet (Oil-based)
DCGT32505MFP-GQ PR1535



Number of products

**GQ Chipbreaker
(PR1535)**

1,600 pcs/ corner

**Tool life
↑ 1.3 times**

Competitor W

1,200 pcs/ corner

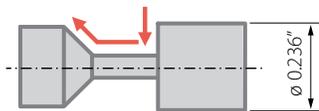
Competitor W's tool life was unstable because of sudden cracking
GQ chipbreaker (PR1535) increased tool life by 1.3 times with stable machining,
no cracking.

(User Evaluation)

TKFB GQ Chipbreaker with Molded Chipbreaker for Back Turning

Adapter: 304L

n = 8,200 RPM
f = 0.0008 ~ 0.002 ipr
D.O.C. = 0.079" Max
Wet (Oil-based)
KTKFR1010JX-12
TKFB12R28005P-GQ PR1535



Tool life

**GQ Chipbreaker
(PR1535)**

2,700 pcs/ corner

**Tool life
↑ 1.5 times**

Competitor Y

1,800 pcs/ corner

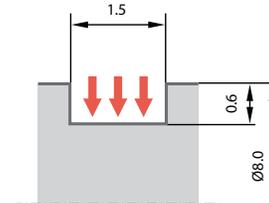
Chip control of Competitor Y was unstable. GQ Chipbreaker (PR1535) showed
stable chip control and improved tool life to 1.5 times longer.

(User Evaluation)

Grooving GBF Molded GL Chipbreaker

Part for Nozzle: 304

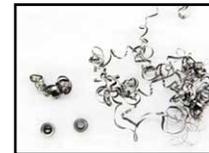
Vc = 148 sfm
f = 0.0020 ipr
Grooving Depth 0.024", Wet
KGBFR1212JX-16F
GBF32R100-005GL PR1535



GL Chipbreaker PR1535



Competitor X



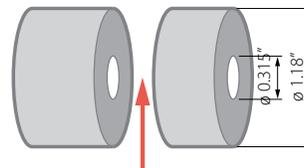
Competitor X's chips entangled with workpiece due to unstable chip control.
GL Chipbreaker maintained stable chip control without entanglement.

(User Evaluation)

Cut-Off Tools KGD for Small Parts

Machine Parts: 304

Vc = 427 sfm
f = 0.0016 ipr
Wet
GDM3020R-025PM-6D PR1535



Number of products

PR1535

400 pcs/ corner

**Tool life
↑ 2 times**

Competitor Z

200 pcs/ corner

While the feed rate of PR1535 was increased higher than Competitor Z
(f = 0.0012 ipr -> 0.0016 ipr), tool life was doubled with good cutting edge condition.

(User Evaluation)

Precision Tooling for Small Parts Machining

Drills

DRA Replaceable Insert Tip Drill (inch) (Ø0.313"~)



DRV Indexable Insert Drill (inch) (Ø0.5"~)



Boring Bars

EZ Bar PLUS Indexable Boring Bar



EZ Bar Solid Boring Series

(Boring, Internal Profiling, Internal Grooving, Face Grooving, Threading)



*Internal coolant holder available

Dynamic Bar Boring Bars



Back Facing Holder with Center Height Adjustment Function

Flange Holder for Back Facing



Sleeve Type



*Standard products are specially designed for Star Precision Co., Ltd. Special orders are available for machines of other makers.

External Sleeve Holder Series (External, Grooving, Threading)

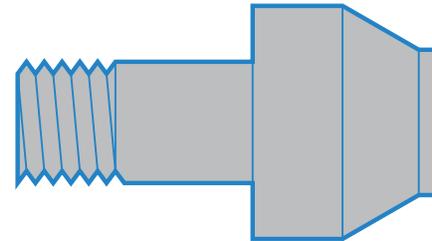


Tools for External Turning

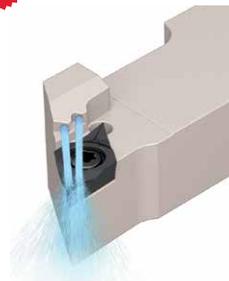
Molded TQ Chipbreaker for Threading



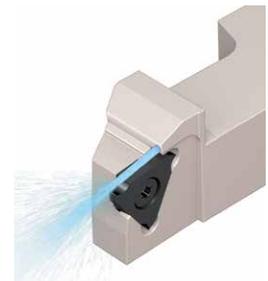
Goose-neck Holder



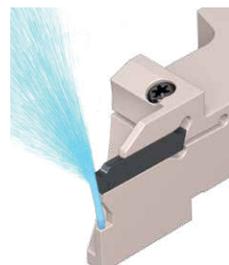
NEW JCTM Direct Coolant-Through Holders



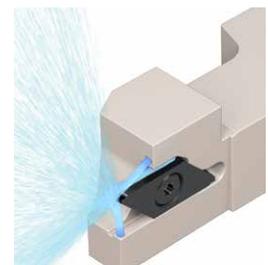
Turning Screw Clamp - JCTM



External Grooving KGBF - JCTM



Cut-Off KGD - JCTM



Cut-Off KTKF - JCTM

Tools for External Turning

Double Sided Tools for Small Parts

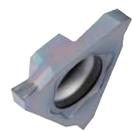
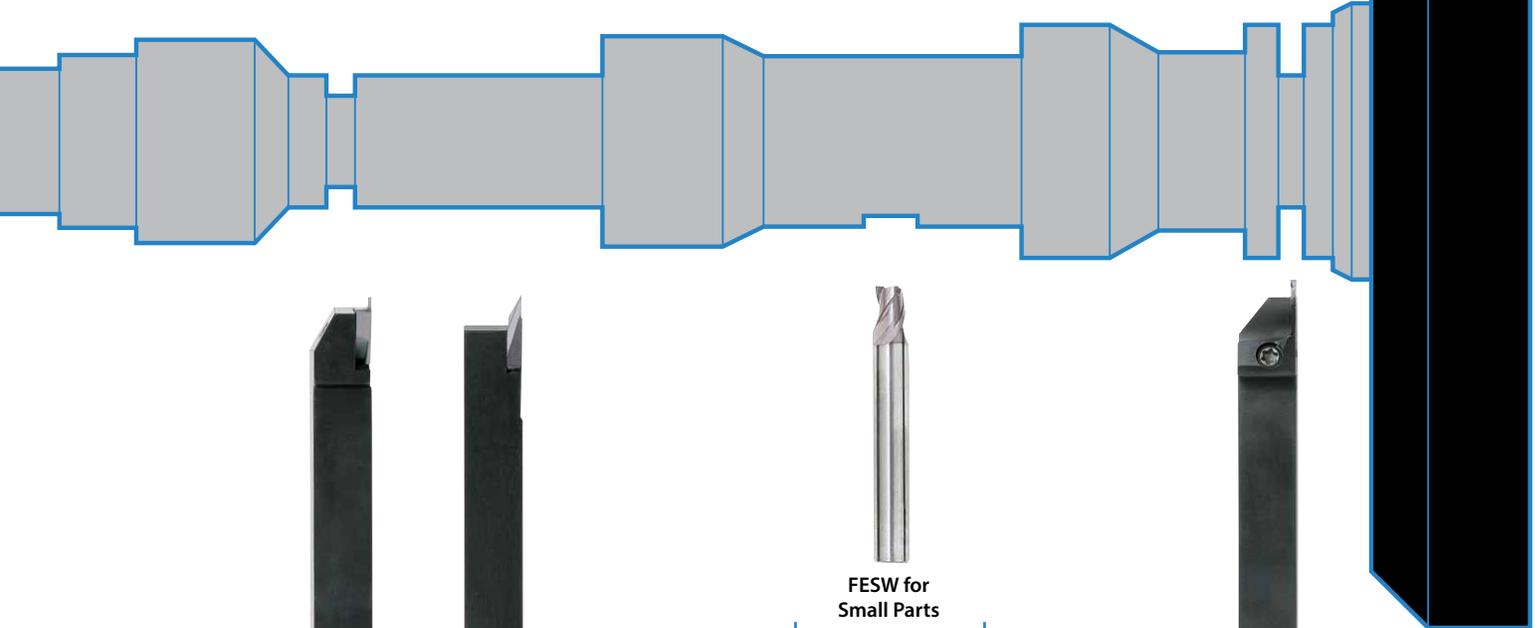
- Large D.O.C. LD Chipbreaker
- General Purpose SK Chipbreaker
- Small Double Sided Tools for Small Parts
- Sharp Edge Chipbreaker



Holders for High Pressure Coolant

External

KTKF-JCT for Cut-Off



GBF-GL Chipbreaker

Grooving Tools with Molded Chipbreaker



KGBF

Grooving



KTKF

Back-Turning



TKFB-GQ Chipbreaker

Back-Turning Tools with Molded Chipbreaker



KGD / KGD-JCT for Small Parts

Cut-off with Jet Coolant-Thru Option for Small Parts Now Available

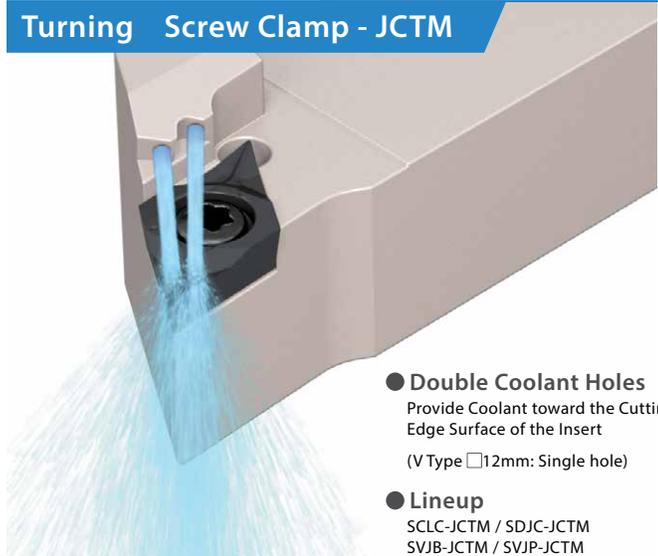


JCTM Direct Coolant Series



Large Lineup for Various Tooling Operations

Turning Screw Clamp - JCTM



- **Double Coolant Holes**
Provide Coolant toward the Cutting Edge Surface of the Insert
(V Type □12mm: Single hole)
- **Lineup**
SCLC-JCTM / SDJC-JCTM
SVJB-JCTM / SVJP-JCTM

Coolant Supply Structure Comparison (Internal Evaluation) (Image)

Screw Clamp - JCTM	Competitor A
Discharges coolant toward the rake surface of insert	Discharges coolant down onto the chip forcing the chip into the part
Chip control performance ✓ Provides stable chip curls	Chip control performance Chip becomes unstable
Cooling effect ✓ The cutting edge stays cool	Cooling effect Chip can cause interference with the workpiece

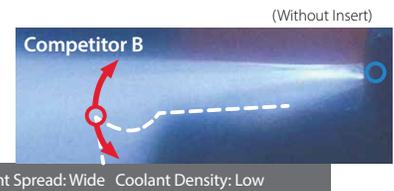
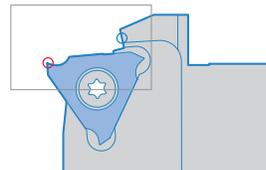
External Grooving KGBF-JCTM



- **Provides Coolant toward the Rake Surface of Insert**
- **Specification**
Edge Width: 0.010" - 0.118" (0.25mm - 3mm)
Ground Chipbreaker / Molded GL Chipbreaker
Maximum groove depth: 0.118" (3mm)

Coolant Discharge Comparison (Internal evaluation) Small chips and better cooling of the insert leads to longer tool life.

- Cutting Edge
- Coolant Hole



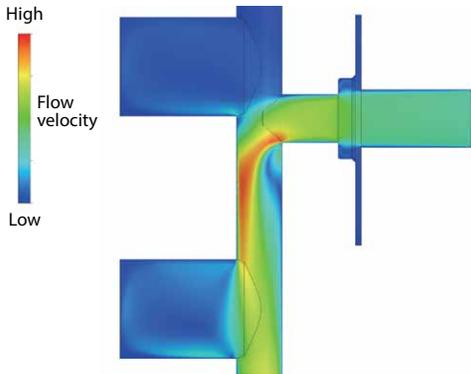


Coolant Channel

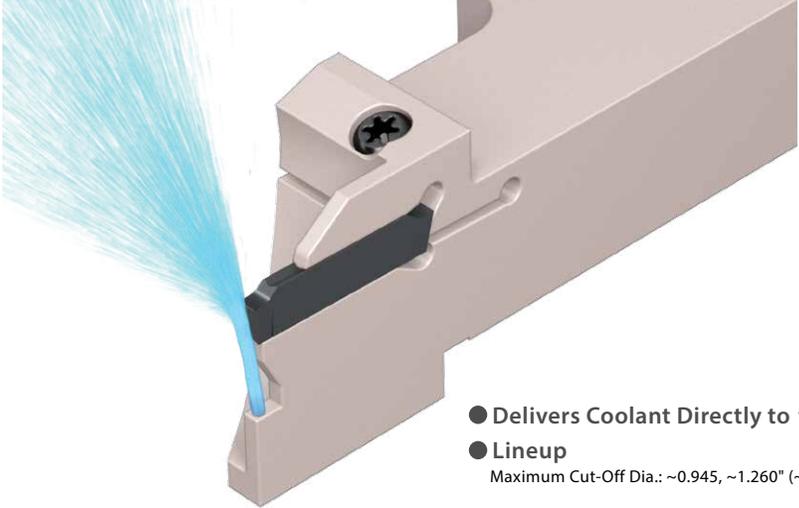
Optimized Coolant Supply

Supply hole designed to reduce energy loss based on extensive flow analysis

Analysis Image (Internal Evaluation)



Cut-Off KGD-JCTM



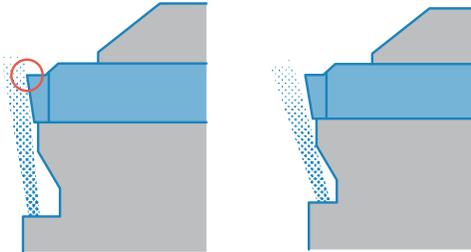
Coolant Discharge Comparison (Image)

KGD-JCTM

Cooling the cutting edge leads to longer tool life

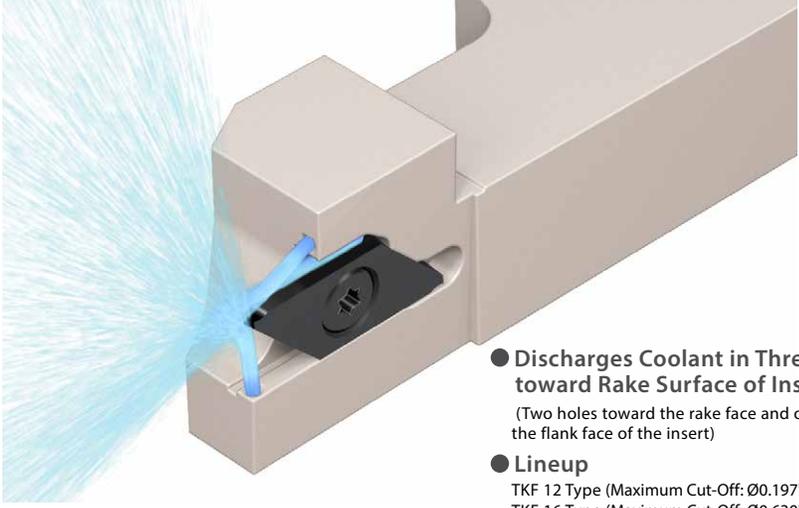
Competitor C

Coolant does not flow directly toward the cutting edge



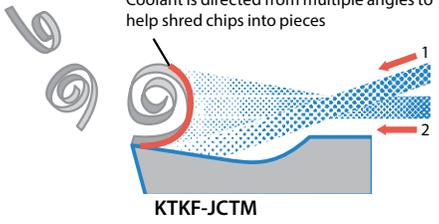
- Delivers Coolant Directly to front Flank Face
- Lineup
Maximum Cut-Off Dia.: ~0.945, ~1.260" (~24mm, ~32mm)

Cut-Off KTKF-JCTM

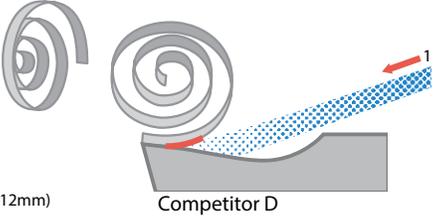


Coolant Discharge Structure Comparison (Image)

Coolant is directed from multiple angles to help shred chips into pieces



KTKF-JCTM



Competitor D

- Discharges Coolant in Three Directions toward Rake Surface of Insert
(Two holes toward the rake face and one hole toward the flank face of the insert)
- Lineup
TKF 12 Type (Maximum Cut-Off: Ø0.197" - Ø0.472" / Ø5mm - Ø12mm)
TKF 16 Type (Maximum Cut-Off: Ø0.630" / Ø16mm)



APD Chipbreaker

Molded PCD Chipbreaker

Superior Chip Control when Machining Aluminum



Improved Chip Control

Beautiful Surface Finish

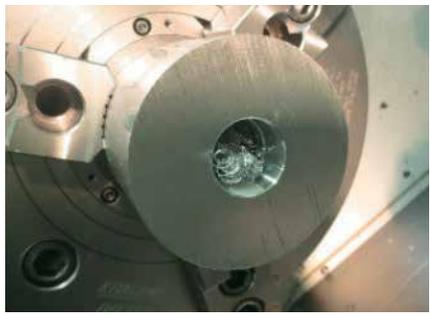
1 Good Chip Control Improves Productivity

Challenges

- ✓ Chip clogging causes machining downtime
- ✓ Low quality, cloudy finish results

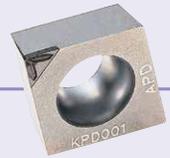


Long chips can cause these problems



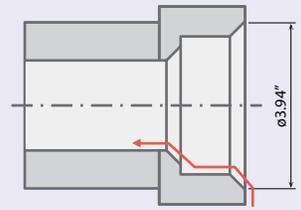
Chip clogging reduces surface finish quality

SOLUTION Newly developed molded chipbreaker design Improved chip control increases productivity

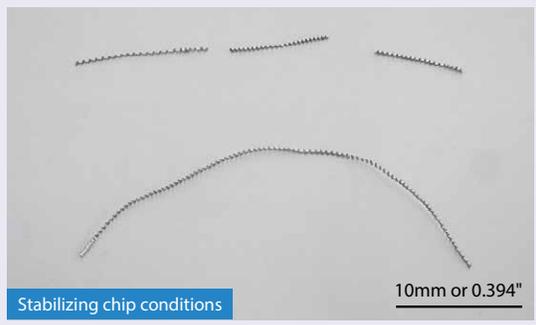


Head ADC12

Cutting Conditions : n = 2700 RPM , Vc = ~2,790 sfm, D.O.C = 0.020", f = 0.004 ipr
 CCMT09T304APD KP001



APD Chipbreaker

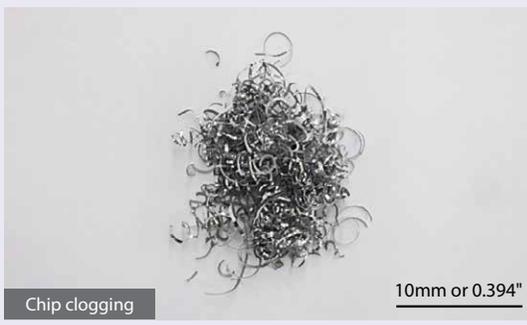


Stabilizing chip conditions

10mm or 0.394"

Chips are evacuated smoothly
 No chip clogging and long chips

Competitor B (without chipbreaker)



Chip clogging

10mm or 0.394"

2

Newly Designed Molded Chipbreaker for Precise Chip Control

Chipbreaker Features

Dot for large D.O.C.

Controls chips with step

Dot for medium D.O.C.

Controls chips with side of dot

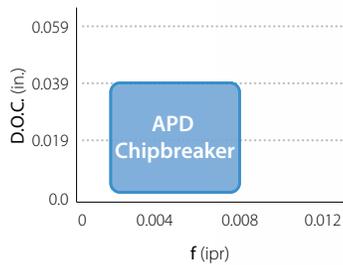
Land for small D.O.C.

Good Control of thin chips

Front edge dots

Stable chip control with a dot that protrudes to the corner

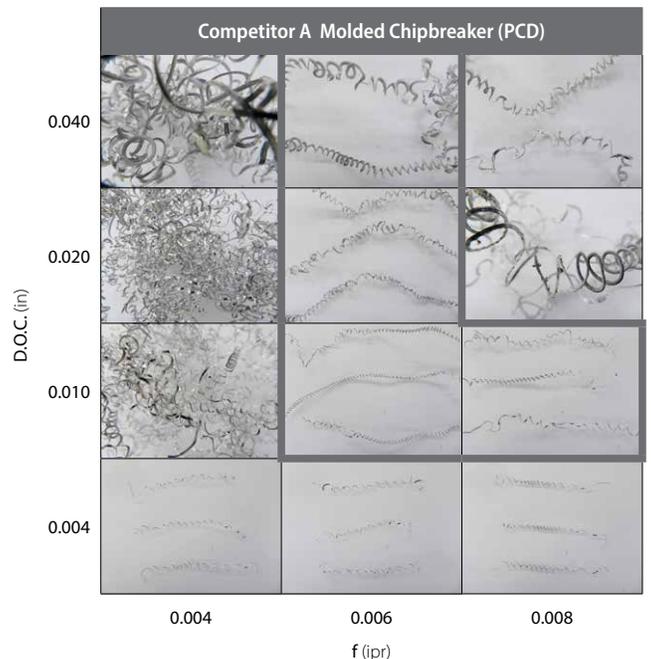
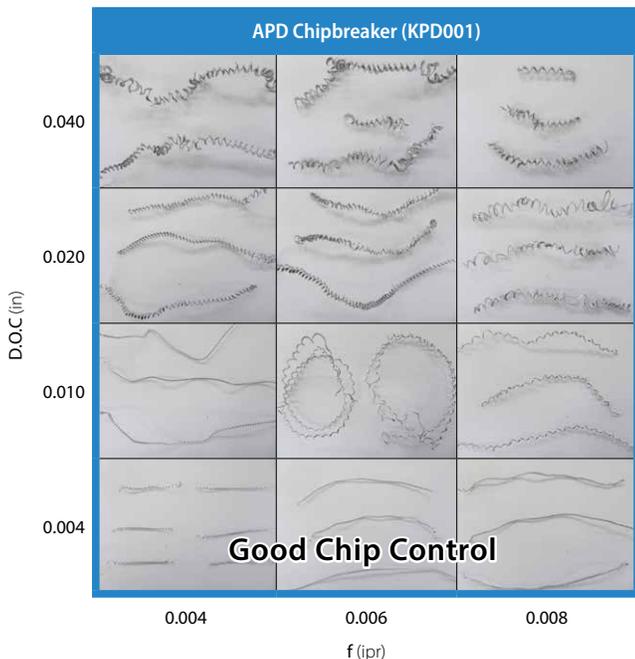
Chipbreaker Map



Chip Control Comparison (Internal evaluation)

APD chipbreaker showed stable machining up to 0.040" D.O.C. under various cutting conditions.

Excellent chip control from small D.O.C. to large D.O.C.



AGT Chipbreaker

Molded PCD Chipbreaker for KTKF Holders

Improved Chip Control for Various Aluminum Alloy Machining Applications

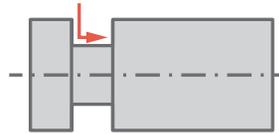
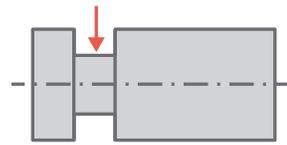


Improved Chip Control

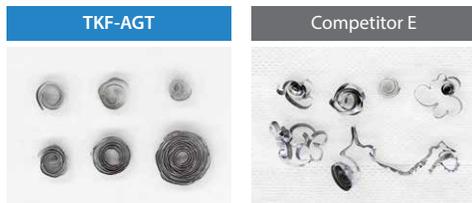
Multi-functional PCD Chipbreaker for Grooving and Traversing

1 Stable Machining for a Wide Range of Applications

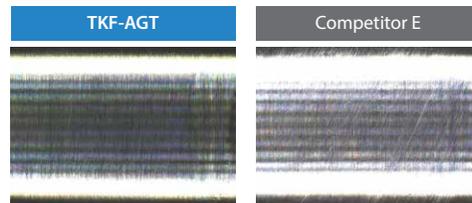
Chip control and surface finish comparison with grooving and traversing



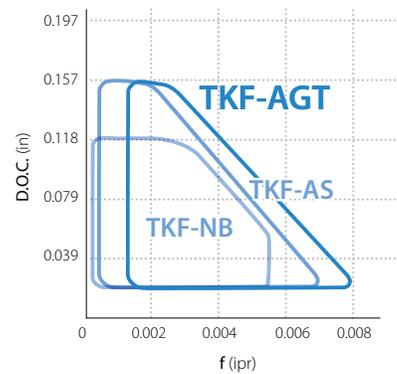
Chip Control Comparison (Grooving)



Surface Finish Comparison (Traversing)



Chipbreaker Map



Cutting Conditions : Vc = 820 sfm, D.O.C. = 0.079", Wet Workpiece : 6061 Cutting Conditions : Vc = 820 sfm, D.O.C. = 0.020", Wet Workpiece : 6061

AGT Chipbreaker showed better chip control when grooving compared to competitor. It also showed superior surface finish with less scratching when traversing.

2 Unique Chipbreaker Provides Excellent Chip Control



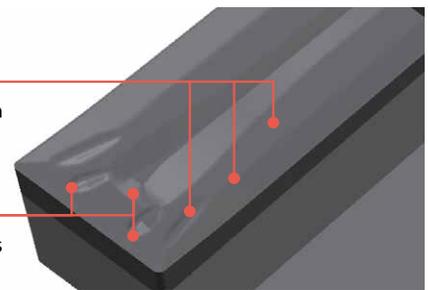
Dots

Traversing

Reduces chip clogging by adjusting the width of the chipbreaker to the D.O.C.
Dots around cutting edge for small D.O.C.

Grooving

Stable machining with three chipbreaker dots



Sloped Cutting Edge

Reduces chattering with low cutting force design
Good surface finish with excellent chip evacuation



Y-axis Toolholders

Improved Chip Control

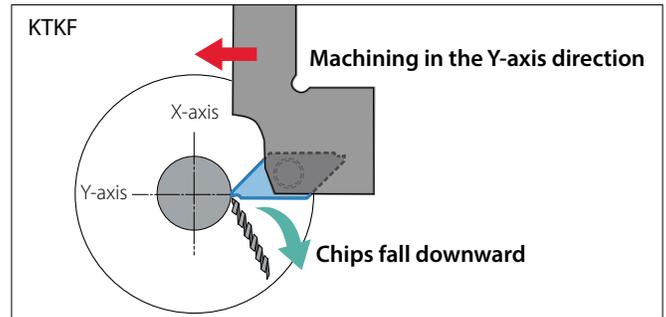
New Toolholder Designs for Better Chip Evacuation in Small Parts Machining



Controls Chip Evacuation



1 Controlled Chip Evacuation for Stable Machining



The Y-axis machining direction allows the chips to fall down and away from the workpiece, improving chip evacuation.

2 KTKF Grooving and Cut-Off System and External Turning Holders

KTKF

Back Turning, Threading and Cut-off



KTKFR1216JX-12-Y : Shank 1216 Type
KTKFR1616JX-12-Y : Shank 1616 Type
Applicable Inserts : TKF12R...

For more details, see Kyocera Y-axis Toolholder brochure.

External Turning

Front turning



SDJCR1212JX-11FF-Y : Shank 1212 Type
SDJCR1616JX-11FF-Y : Shank 1616 Type
Applicable Inserts : DC □□ 325...

Additional Featured Products

TQ Chipbreaker Threading Insert with Molded Chipbreaker



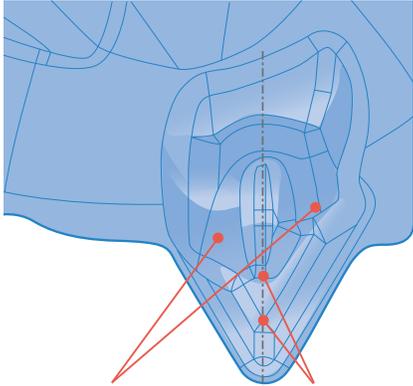
Molded Chipbreakers Achieve Stable Chip Control and Continuous Machining
Applicable to Small Part Machining with Low Cutting Force Design

Stable Chip Control

Stable chip control in a given direction with asymmetric chipbreaker design

Chipbreaker Geometry

Stable chip control regardless of cutting direction



For Radial Infeed

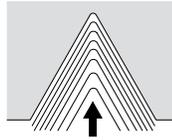
Asymmetric bump design controls chip-flow direction

For Flank Infeed / Flank Compound Infeed

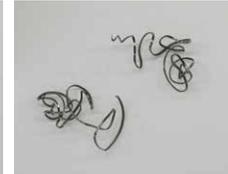
Breaks chips easily with shallow chipbreaker depth

Chip Control Comparison (Internal Evaluation)

Radial Infeed

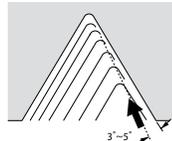


TQ Chipbreaker



Competitor B

Flank Compound Infeed



TQ Chipbreaker



Competitor B

Cutting Condition : $V_c = 492$ sfm, D.O.C. = 0.0047" (4th Pass), $L = 0.97$ ", Wet, 16ER150ISO Type M45 x P1.5 Workpiece : 4118



Additional Featured Products

LD Chipbreaker Large Depths of Cut



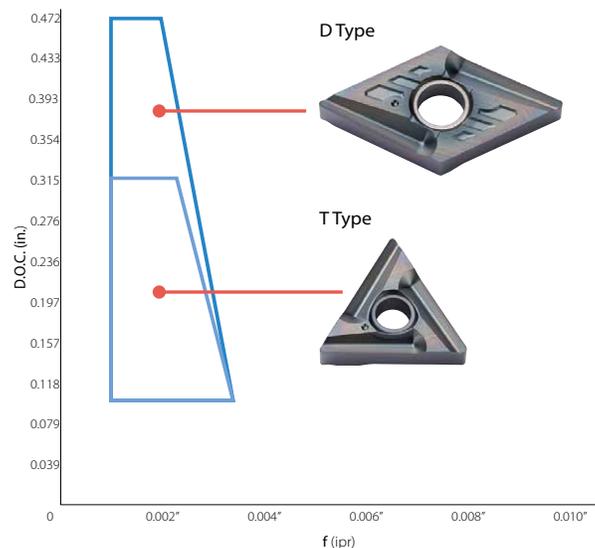
Suitable for Large Depths of Cut Machining in a Single Pass

Max Depth of Cut is 0.47". LD Chipbreakers achieve high-precision machining in a single pass. Low-resistance cutting edge suppresses chattering offering stable chip control in a wide range of machining applications.



Large rake angle and slanted cutting edge for low-resistance, smooth machining

LD Chipbreaker Application Map



KYOCERA Precision Tools

102 Industrial Park Road
Hendersonville, NC 28792
Customer Service | 800.823.7284 - Option 1
Technical Support | 800.823.7284 - Option 2



Official Website | www.kyoceraprecisiontools.com
Distributor Website | mykpti.kyocera.com
Email | cuttingtools@kyocerapti.com

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