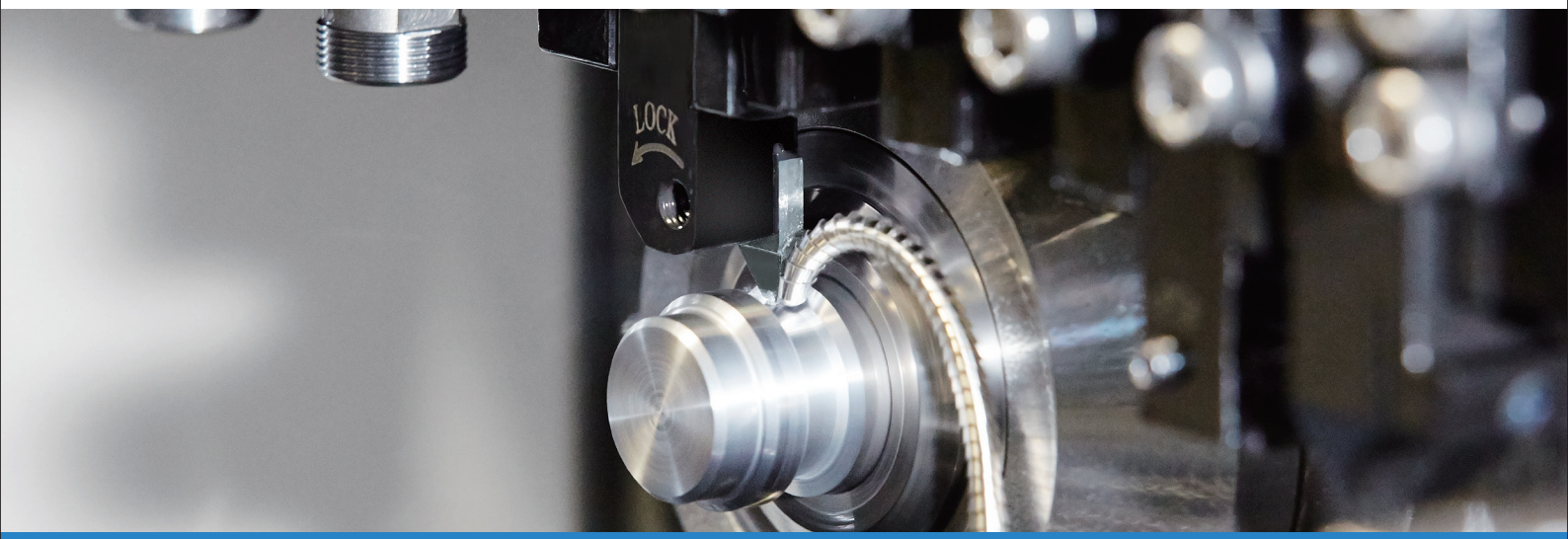
THE NEW VALUE FRONTIER

KYOCERA

Back-turning tool | TKFB-GQ

Back Turning with 3D Molded Chipbreaker

TKFB-GQ Chipbreaker



Good Chip Evacuation and Excellent Surface Finish with 3D Molded Chipbreaker

Reduced Cycle Time by Increasing Depth of Cut Capabilities

PR1535 Extends Tool Life in Stainless Steel Machining

Back Turning with 3D Molded Chipbreaker

TKFB-GQ Chipbreaker

Good Chip Evacuation and Excellent Surface Finish with 3D Molded Chipbreaker
Reduced Cycle Time by Increasing Depth of Cut Capabilities

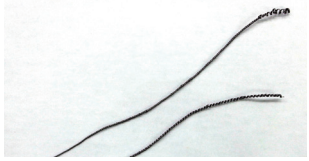
1 Good Chip Evacuation with 3D Molded Chipbreaker

Original 3D Molded Chipbreaker with Two Functions

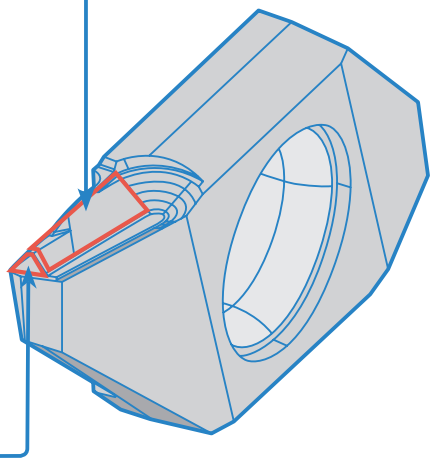
Grooving — Good Surface Finish

Prevents Chip Crunching

GQ Chipbreaker



Competitor A (Ground)



Turning — Stable Chip Control

Prevents Chip Entanglement

GQ Chipbreaker

Competitor B (Ground)

Chip Control Comparison (Turning)
(In-house Evaluation)

Prevents Entanglement with Tightly Curled Chips

Stable Chip Control Over Wide Range of Cutting Conditions

S45C

(f) / (ap)	GQ Chipbreaker 0.03 mm/rev	GQ Chipbreaker 0.05 mm/rev	GQ Chipbreaker 0.07 mm/rev	Competitor C (Molded) 0.03 mm/rev	Competitor C (Molded) 0.05 mm/rev	Competitor C (Molded) 0.07 mm/rev
4 mm Competitor (3.5)						✕ Chip Clogging
3 mm						
2 mm					△ Unstable Chip Control	

Cutting Conditions: Vc = 100 m/min, Wet

SUS304

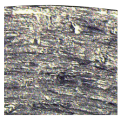
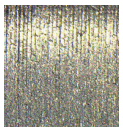
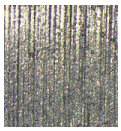
(f) / (ap)	GQ Chipbreaker 0.02 mm/rev	GQ Chipbreaker 0.04 mm/rev	GQ Chipbreaker 0.06 mm/rev	Competitor D (Molded) 0.02 mm/rev	Competitor D (Molded) 0.04 mm/rev	Competitor D (Molded) 0.06 mm/rev
4 mm Competitor (3.5)					✕ Insert Fracture	
3 mm					✕ Chip Clogging	
2 mm	△ Unstable Chip Control			△ Unstable Chip Control		

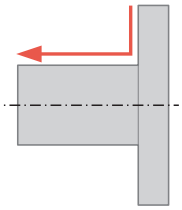
Cutting Conditions: Vc = 80 m/min, Wet

2 Excellent Surface Finish by Preventing Chip Crunching and Clogging

Reduced Cycle Time with GQ Chipbreaker by Increasing Depth of Cut Capabilities

Surface Finish Comparison (In-house Evaluation)

Workpiece Surface		GQ Chipbreaker	Competitor E (Ground)
	Grooving	 Rz = 2.92 μm	 Rz = 31.23 μm
		Excellent Surface	Chip Crunching
	Turning	 Rz = 3.85 μm	 Rz = 7.67 μm



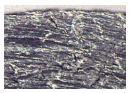
1-Pass Machining | Reduced Cycle Time

Cutting Conditions: Vc = 100 m/min, ap = 3.0 mm, f = 0.02 mm/rev (Grooving), 0.05 mm/rev (Turning), Wet
Workpiece: S45C

Surface Finish Comparison (In-house Evaluation)

Grooving Excellent Surface Finish at Large Depths of Cut

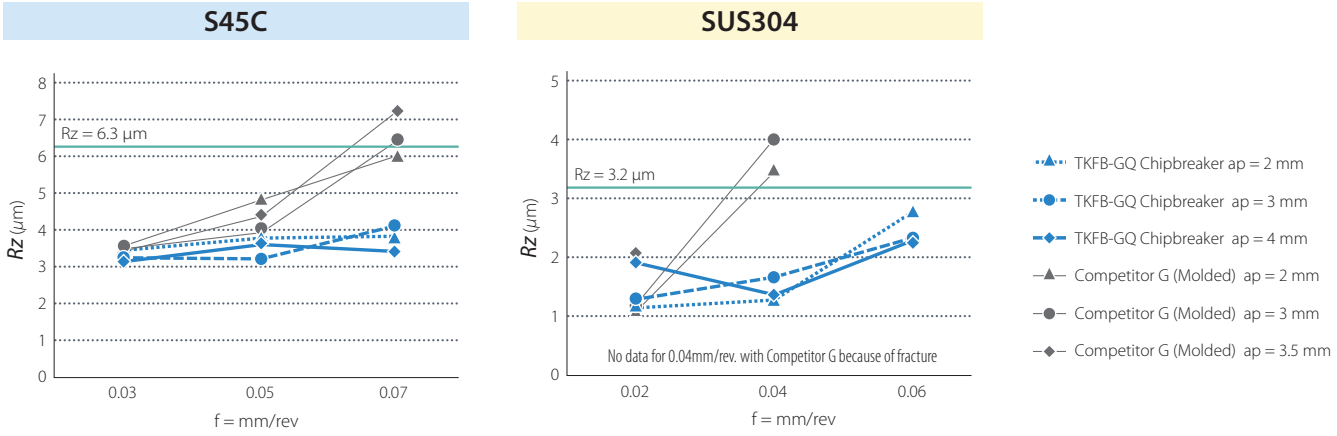
Flange Finish

ap	4 mm	3 mm	2 mm
GQ Chipbreaker	 Rz = 2.63 μm	 Rz = 2.92 μm	 Rz = 2.41 μm
Competitor F (Ground)	 Rz = 27.88 μm	 Rz = 31.23 μm	 Rz = 25.56 μm

Cutting Conditions: Vc = 100 m/min, f = 0.02 mm/rev, Wet Workpiece: S45C

Turning Prevents Chip Clogging and Entanglement at High Feed Rates

Surface Finish During External Turning (In-house Evaluation)



Cutting Conditions: Vc = 100 m/min (S45C), 80 m/min (SUS304) f = 0.03 – 0.07 mm/rev (S45C), 0.02 – 0.06 mm/rev (SUS304) Wet

MEGACOAT NANO PR1535

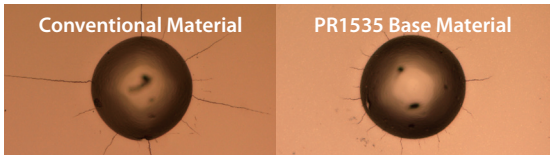
Combination of tough substrate and special nano layer coating enables long tool life and stable machining of stainless steel

1. Toughening with a New Cobalt Mixing Ratio
   * Comparison with our Conventional Grade
2. Improved Stability by Optimization and Homogenization of the Particle Matrix
3. Long Tool Life and Stable Machining with MEGACOAT NANO

UP 23% Fracture Toughness*

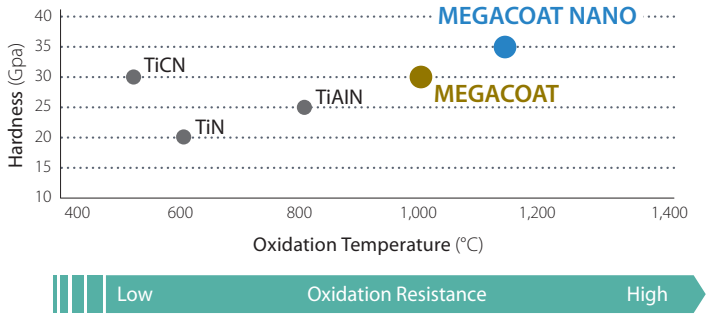
Cracking Comparison by Diamond Indentor
(In-house Evaluation)

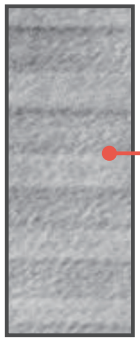
UP Shock Resistance



Long Cracks　　Short Cracks

Coating Film Property

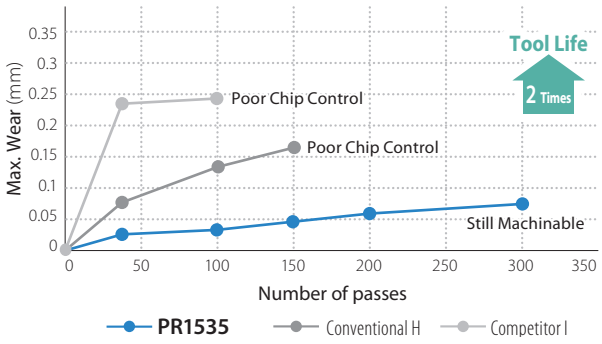




Layer Structure of MEGACOAT

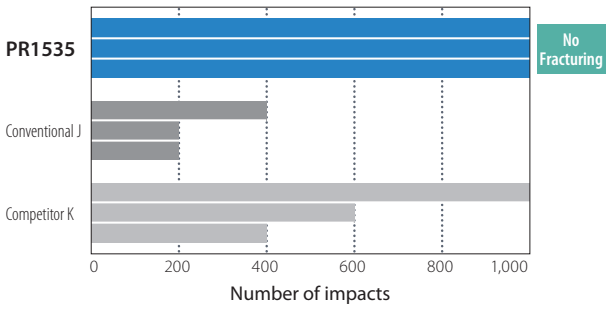
PR1535 is a good solution for unstable conditions such as early fracturing and variable tool life during steel machining

Wear Resistance Evaluation (In-house Evaluation)



Cutting Conditions: n = 1,273 min^{-1} (Vc = 80 m/min), f = 0.025 mm/rev, Wet (Oil Base)　Workpiece: SUS304 (ø20)

Fracture Resistance Comparison (In-house Evaluation)

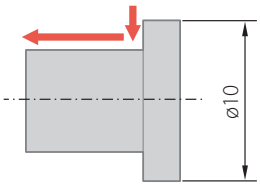


Cutting Conditions: Vc = 80 m/min, f = 0.12 mm/rev, Wet (Water Soluble)
Workpiece: SUS304 (ø50, 10 mm 4 slots)

Case Studies

Bolt SUM23

Vc = 90 m/min
ap = 2 mm
f = 0.025 mm/rev (Grooving)
f = 0.04 mm/rev (Turning)
Wet
TKFB12R28015-GQ
PR1225



Number of Workpieces

Tool Life 2 Times

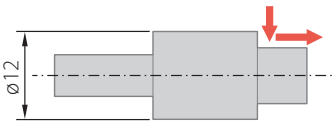
PR1225 5,000 pcs/edge

Competitor L 2,500 pcs/edge

TKFB-GQ Chipbreaker (PR1225) showed 2 times longer tool life compared to Competitor L.
Stable machining with minimal deflection was achieved.
(User Evaluation)

Shaft SUJ2

Vc = 50 m/min
ap = 2 mm
f = 0.03 mm/rev (Grooving)
f = 0.05 mm/rev (Turning)
Wet
TKFB12R28015-GQ
PR1225



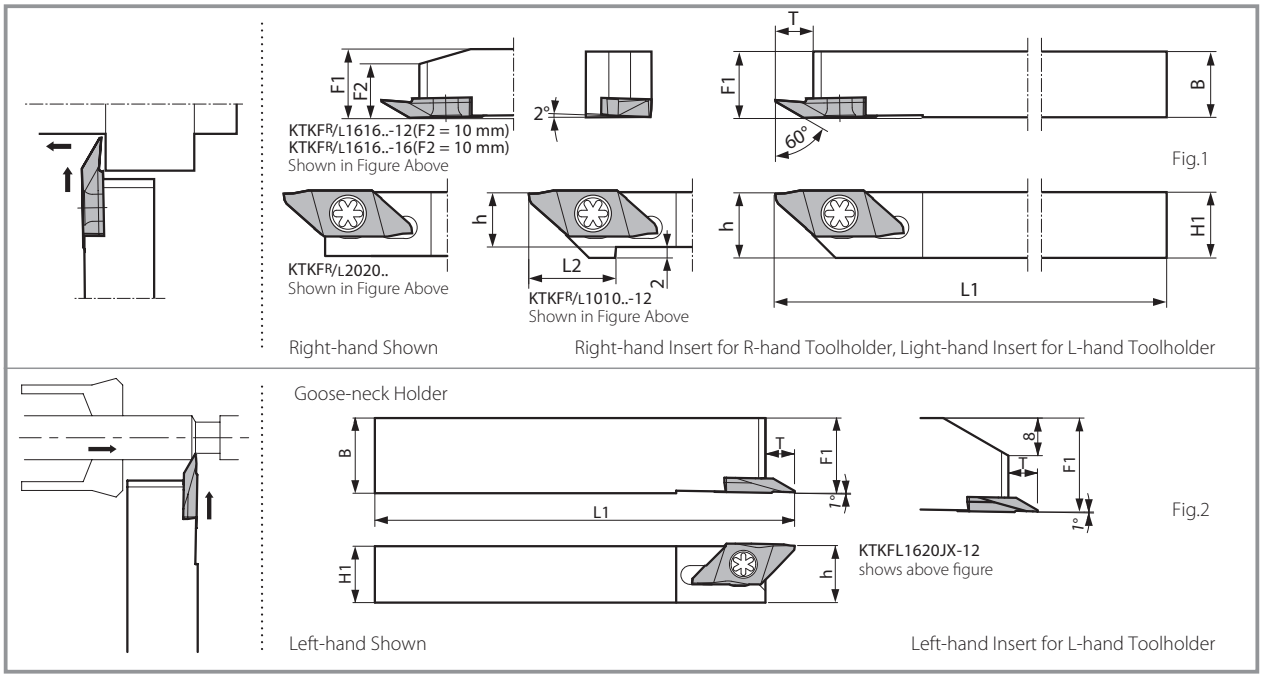
Number of Workpieces

PR1225 1,500 pcs/edge　GQ Chipbreaker

Competitor M 1,500 pcs/edge　Competitor M

TKFB-GQ Chipbreaker (PR1225) maintained smoother chip control compared to Competitor M.
(User Evaluation)

KTKF/KTKF (Goose-neck Holder)



Toolholder Dimensions

Description		Stock R	Stock L	Dimensions (mm) H1 = h	B	L1	L2	F1	T	Shape	Spare Parts: Clamp Screw	Spare Parts: Wrench	Applicable Inserts
KTKF$^{R}_{L}$	1010JX-12	●	●	10	10	120	15	10	6	Fig. 1	SB-4590TRWN	LTW-10S	TKFB12$^{R}_{L}$ ...
	1212JX-12	●	●	12	12	120	–	12	6				
	1616JX-12	●	●	16	16	120	–	16	6				
	2020JX-12	●	●	20	20	120	–	20	6				
KTKF$^{R}_{L}$	1010JX-16	●	●	10	10	120	20	10	8				TKFB16$^{R}_{L}$ ...
	1212JX-16	●	●	12	12	120	–	12	8				
	1616JX-16	●	●	16	16	120	–	16	8				
	2020JX-16	●	●	20	20	120	–	20	8				
KTKF$^{R}_{L}$	1212F-12	●	●	12	12	85	–	12	6				TKFB12$^{R}_{L}$ ...
KTKF$^{R}_{L}$	1212F-16	●	●	12	12	85	–	12	8				TKFB16$^{R}_{L}$ ...
KTKFL	1216JX-12		●	12	16	120	–	16	6	Fig. 2			TKFB12L ...
	1620JX-12		●	16	20	120	–	20	6				

Dimension T shows the distance from the Toolholder to the cutting edge

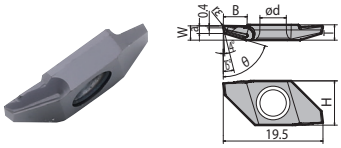
● : Standard Stock

Applicable Inserts

NEW

Usage Classification						Applicable Toolholder
	P	Carbon Steel / Alloy Steel	●	◔	◔	
	M	Stainless Steel	◔	●	◔	
	K	Gray Cast Iron				
		Nodular Cast Iron				
	N	Non-ferrous Material				
	S	Heat-Resistant Alloy	◔	●	◔	
		Titanium Alloy		●		
	H	Hardened Material				

●: Continuous - Light Interruption / 1st Choice
◔: Continuous - Light Interruption / 2nd Choice
●: Continuous / 1st Choice
○: Continuous / 2nd Choice

Shape	Description	Dimensions (mm) W	a	B	R(rε)	T	H	ød	Angle (°) θ	MEGACOAT NANO PR1425	MEGACOAT NANO PR1535	MEGACOAT PR1225	Applicable Toolholder
	TKFB 12R28005-GQ	2.8	1.5	4.6	0.05	3.0	8.7	5.2	74°	●	●	●	KTKFR ...12
	12R28015-GQ	2.8	1.5	4.6	0.15	3.0	8.7	5.2	74°	●	●	●	
	TKFB 16R38005-GQ	3.8	1.8	6.3	0.05	4.0	9.5	5.2	72°	●	●	●	KTKFR ...16
	16R38015-GQ	3.8	1.8	6.3	0.15	4.0	9.5	5.2	72°	●	●	●	

● : Standard Stock

Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

Workpiece		Recommended Insert Grade						Remarks
		MEGACOAT NANO				MEGACOAT		
		PR1425		PR1535		PR1225		
		Grooving	Traversing	Grooving	Traversing	Grooving	Traversing	
Carbon Steel / Alloy Steel	Cutting Speed (m/min)	★ 80 – 200		☆ 60 – 150		☆ 60 – 150		Wet
	Feed (mm/rev)	0.01 – 0.04	0.02 – 0.15	0.01 – 0.04	0.02 – 0.15	0.01 – 0.04	0.02 – 0.15	
Stainless Steel	Cutting Speed (m/min)	☆ 60 – 150		★ 60 – 130		☆ 60 – 130		
	Feed (mm/rev)	0.01 – 0.03	0.02 – 0.1	0.01 – 0.03	0.02 – 0.1	0.01 – 0.03	0.02 – 0.1	

Inserts Identification System (See Table 1)

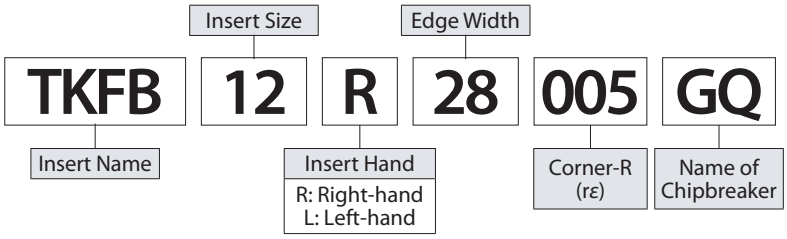
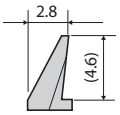
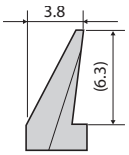
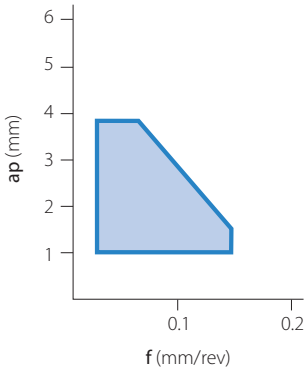


Table 1 (Insert Width)

General Purpose	Large Machining
	
TKFB12$^{R}/_{L}$28..	TKFB16$^{R}/_{L}$38..

Applicable Range (Steel)

TKFB12R280..GQ



TFKB16R380..GQ