KYOCERA

AHB
TOOLING & MACHINERY

COMPLETE METALWORKING SOLUTIONS
(800) 991-4225 www.ahbinc.com
ISO Certified customerservice@ahbinc.com

GBA

External & Internal Shallow Grooving System

New insert grades provide smooth chip control and excellent surface finish

New Insert grades PR20 series provide longer tool life

PR2015 : for Steel and Cast iron

PR2025 : for Steel and Stainless steel

Excellent chip control with GM chipbreaker

NEW **PR20 Series Insert Grades for steel, stainless steel, and cast iron**

External & Internal Shallow Grooving Tools

GBA

New generation insert grades for Steel,
Stainless steel and Cast iron
Excellent chip control and superior surface finish

MEGACOAT NANO EX | Grooving Cut-Off |

1 New grades PR20 series for general purpose MEGACOAT NANO EX coating technology provides long tool life

New grades for Grooving and Cut-off solutions

NEW

PR20 series

The newly developed "MEGACOAT NANO EX" is a PVD coating specialized for Grooving and Cut-off machining

Multi-layering of high content aluminum nano layers

Stable high-temperature hardness with excellent wear and oxidation resistance

PR2015

1st recommendation for steel and cast iron

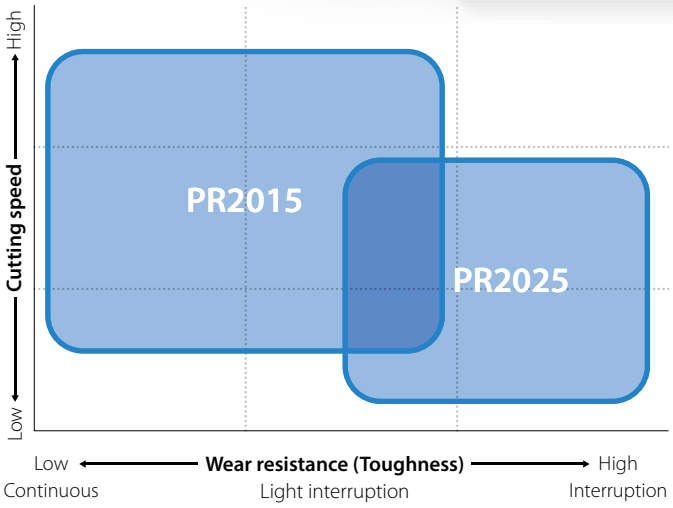
Excellent balance of hardness, toughness and versatility

PR2025

Stability oriented for steel

1st recommendation for stainless steel

Excellent fracture resistance and high stability for interrupted machining



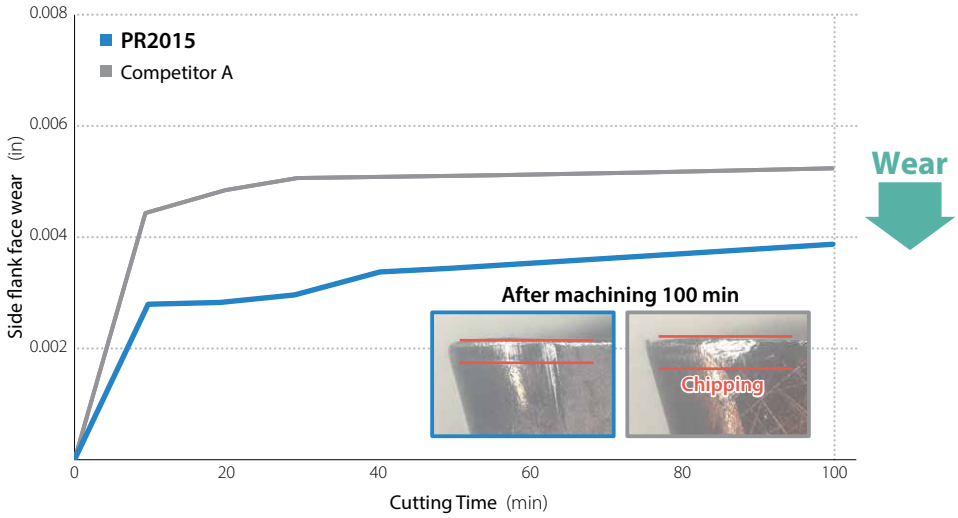
Workpiece	P Steel					M Stainless steel					K Cast iron				
ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Lineup	General purpose/1st recommendation PR2015					1st recommendation PR2025					1st recommendation PR2015				
	Stability oriented PR2025														

Excellent wear and fracture resistance for long tool life and good surface finish

Delivers superior wear resistance and fracture resistance

Good surface finish

Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = 660 sfm, ae = 0.059" (shouldering), f = 0.004 ipr, GBA43R300-030GM, Workpiece : 1045

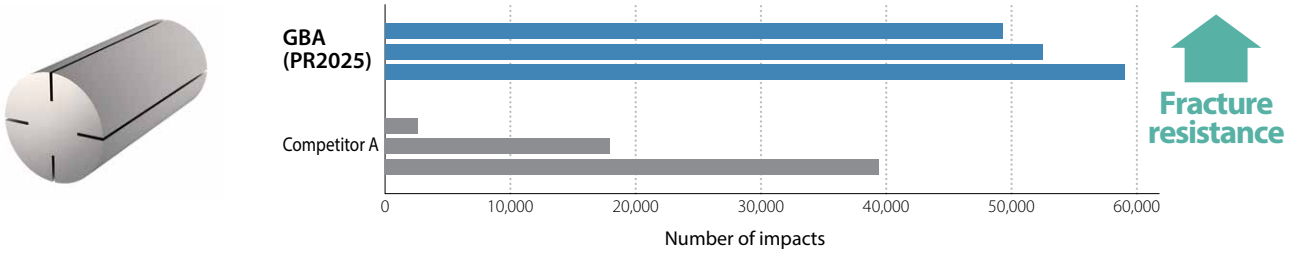
Surface finish comparison (Internal evaluation)

Bottom of the groove

Cutting conditions : Vc = 660 sfm
ae = 0.059" (grooving), f = 0.004 ipr
GBA43R300-030GM, Workpiece : 4131

Excellent fracture resistance and high stability for interrupted machining

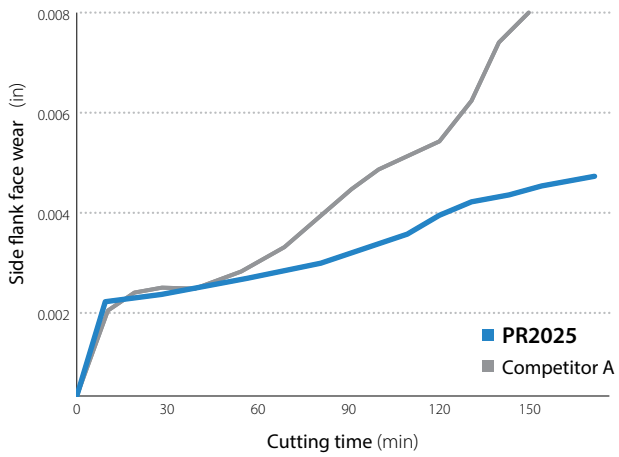
Fracture resistance comparison (Internal evaluation)



Cutting conditions : Vc = 490 sfm, ae = 0.059" (shouldering), f = 0.006 ipr, GBA43R300-030GM, Workpiece : 4140 (4 Grooves in Workpiece)

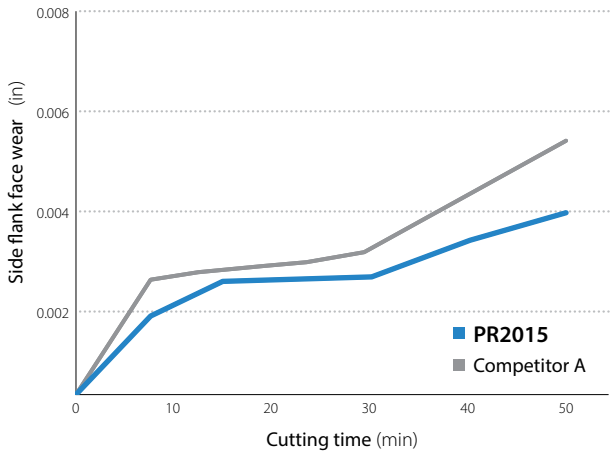
Long tool life for stainless steel and cast iron

304 Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = 490 sfm, ae = 0.059" (shouldering), f = 0.004 ipr, GBA43R300-030GM

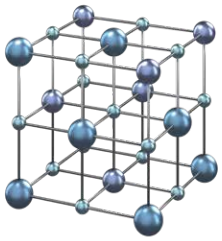
65-45-12 Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = 660 sfm ae = 0.059" (shouldering), f = 0.004 ipr, GBA43R300-030GM

2 New coating MEGACOAT NANO EX for grooving and cut-off machining Long tool life and high stability with exellent high-temperature hardness

MEGACOAT NANO EX | Grooving Cut-Off |



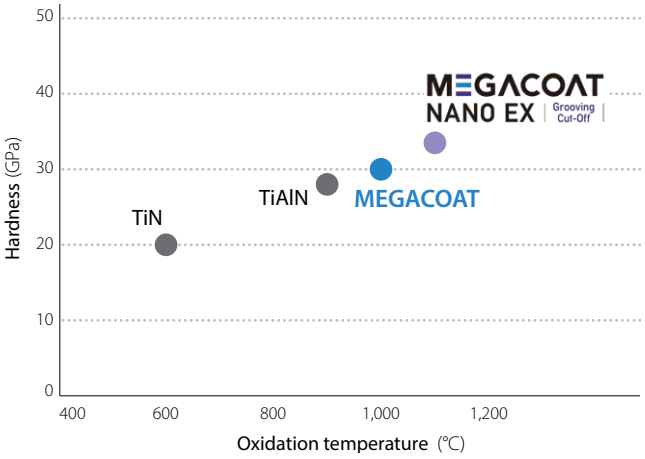
Achieve long tool life and high stability with the combination of

High content aluminum nano coating layer

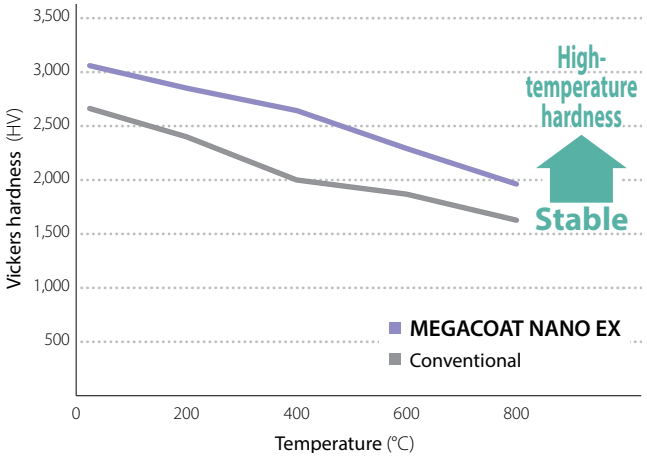
Challenges Since most grooving is continuous machining, the wear progress of the insert is rapid
Tool life is shortened due to deterioration of surface finish, machining accuracy, burrs, etc.

SOLUTION MEGACOAT NANO EX is a special nano coating layer with a high aluminum content developed by Kyocera's unique technology
Solve these machining challenges with exellent wear resistance, high-temperature hardness and plastic deformation resistance

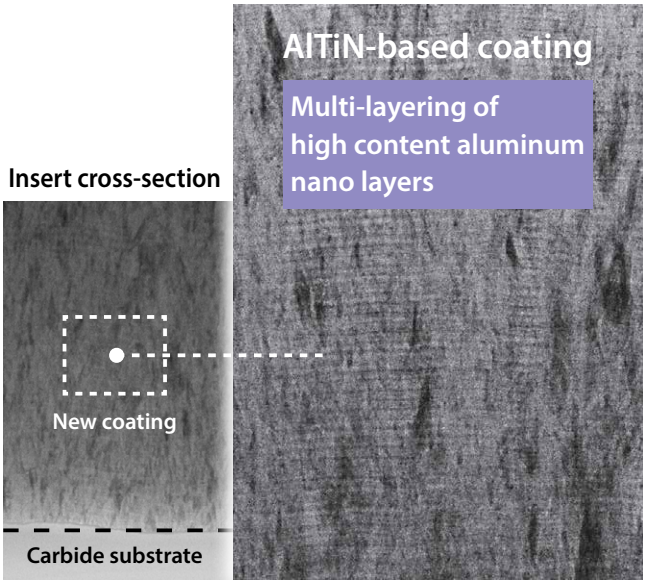
Coating characteristics (Internal evaluation)



Comparison of vickers hardness transition with temperature
(Internal evaluation)



Special nano coating layer



Long tool life Exellent wear and fracture resistance

Multi-layering of high content aluminum nano layers added with high melting point material having different concentration

Suppresses hexagonal crystal precipitation and achieves excellent oxidation resistance

Stable machining High coating toughness

Crystal grain refinement

Optimized internal stress suppresses crack growth

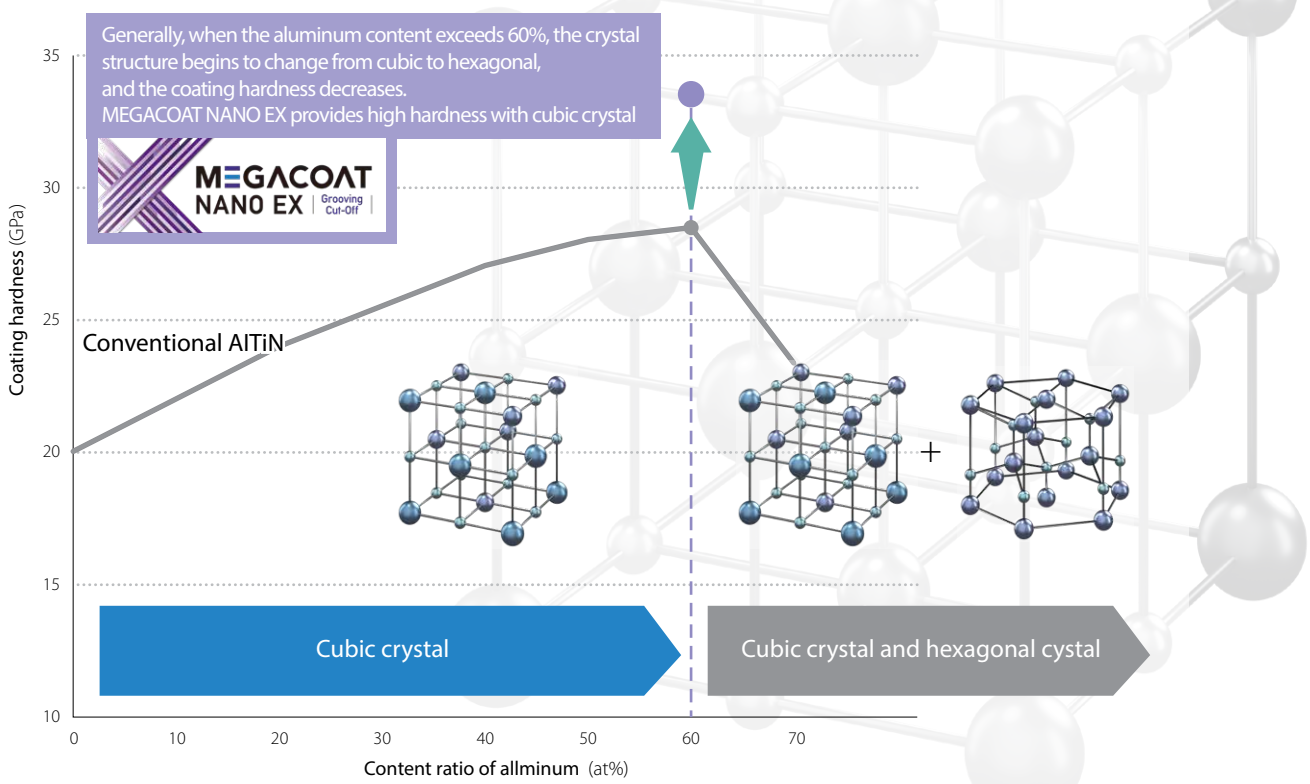
Unique Technology

Proprietary coating process
Improve high aluminum-containing nano layers performance

Established a proprietary coating process with the addition of high melting point materials

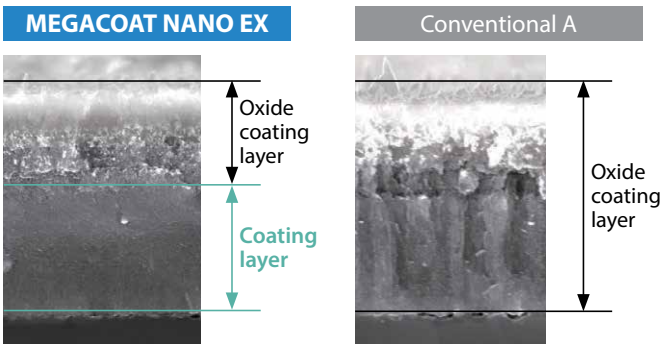
Maintains a cubic crystal structure to maximize the properties of aluminum (Al)

Correlation between aluminum content and coating hardness (Internal research)



Oxidation progression comparison (Internal evaluation)

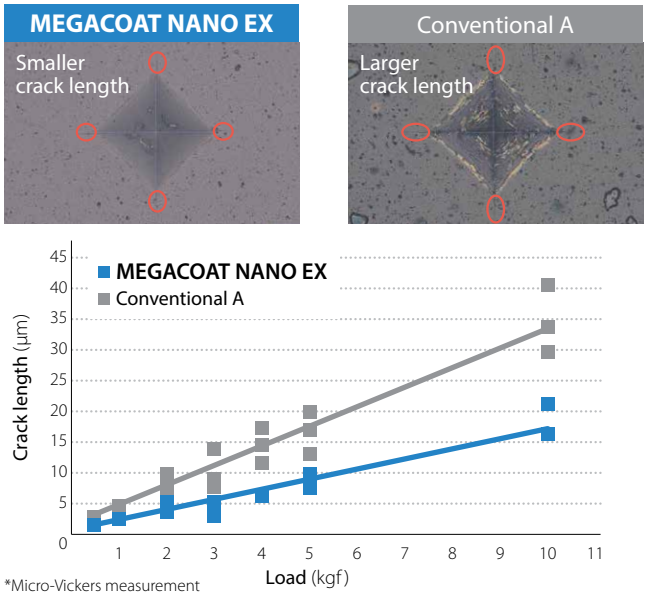
Suppresses oxidation progression with excellent oxidation resistance



*Section after holding at 1,100 degrees for 5 minutes in air

Coating layer toughness evaluation (Internal evaluation)

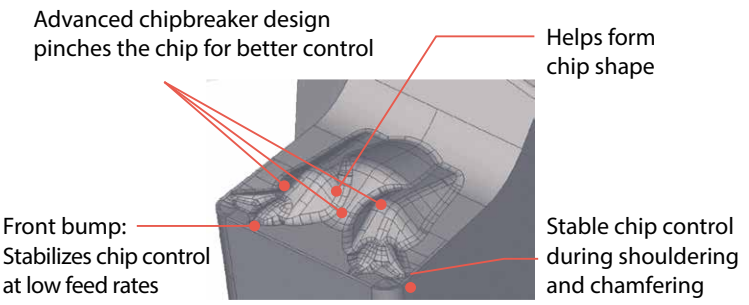
Excellent coating toughness with small crack length



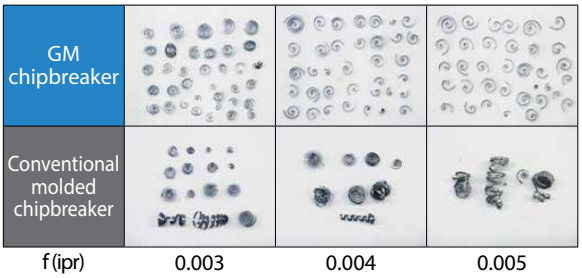
*Micro-Vickers measurement

3 Smooth chip control with GM chipbreaker

Multi-bump design



Chip control comparison (Internal evaluation)



Cutting Conditions : Vc = 660 sfm, Edge Width 2.0 mm, Grooving
Workpiece : 5120 (Ø1.575")

4 Great for high pressure coolant Provides excellent chip control and long tool life

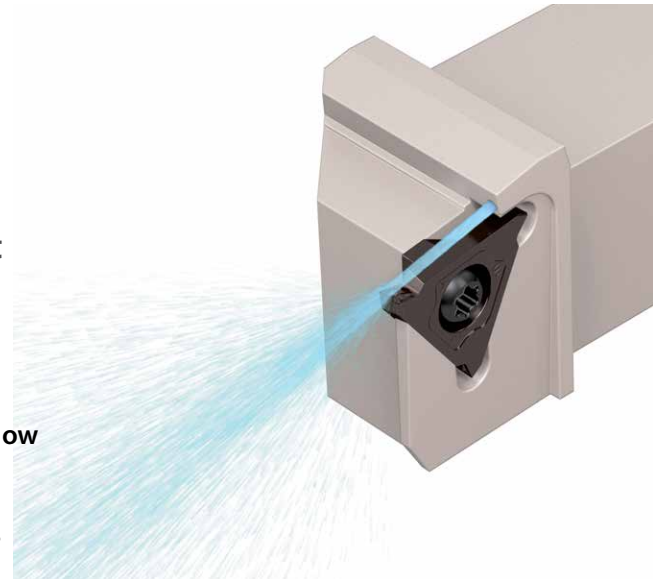
Jet Coolant-Through

Great for high pressure coolant, toolholder for shallow grooving

KGBA-JCT

KGBA-JCT can direct coolant closer to the cutting edge from the top of the insert

Excellent chip control and longer tool life



Coolant hole

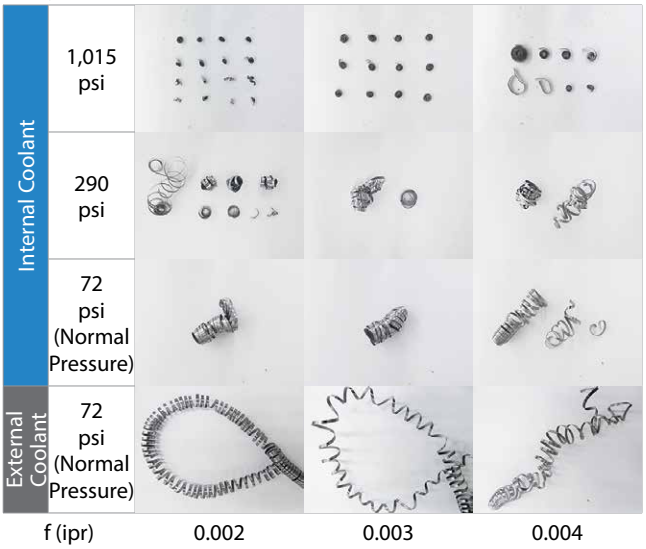
Coolant is discharged to the cutting edge
Prevents coolant stream spreading and slowing coolant flow

Coolant direction

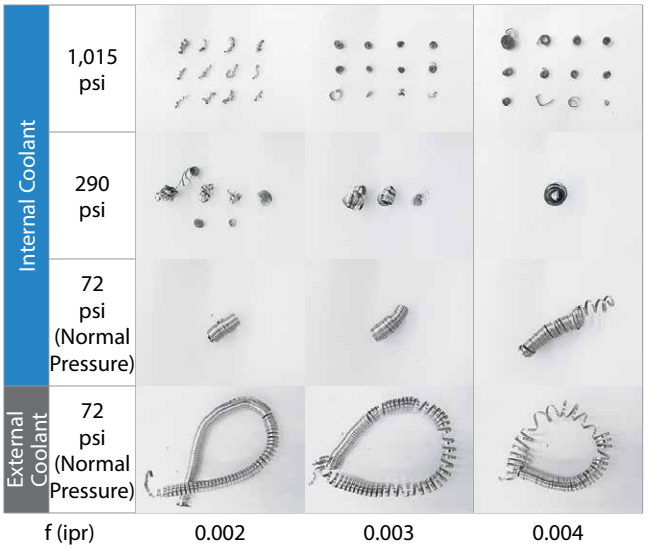
Sufficient coolant between the chipbreaker and the chips
Stable chip curls and sufficient cooling of the insert

Chip control comparison (Internal evaluation)

Alloy steel (5120)



Stainless steel (304)



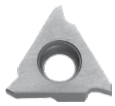
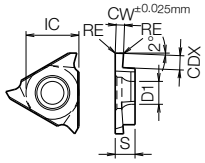
Cutting Conditions: Vc = 490 sfm (Alloy Steel) / 330 sfm (Stainless Steel), f = 0.002~0.004 ipr, Groove Depth = 0.079" (2mm), Wet
KGBAR2525K22-15JCT, GBA43R200-020 (PR1215)

GBA Inserts (Metric Size)

Part Number	IC		S		D1	
	in	mm	in	mm	in	mm
GBA R/L 32...	3/8	9.525	1/8	3.18	0.173	4.4
GBA R/L 43...	1/2"	12.7	3/16	4.76	0.217	5.5
GBA43 R/L 480...			0.197	5.00	0.217	5.5

		NEW	NEW						
P	Carbon Steel / Alloy Steel	●	●	○	◔	●			
M	Stainless Steel		●	○	◔				
K	Cast Iron	●		◔					◔
N	Non-ferrous Metals								●
S	Titanium Alloy								●
H	Hardened Materials								

Classification of Usage
● : Light Interruption / 1st Choice
◔ : Light Interruption / 2nd Choice
● : Continuous / 1st Choice
○ : Continuous / 2nd Choice

Insert Right-handed Insert Shown	Part Number	Dimensions (mm)				MEGACOAT NANO EX		MEGACOAT	MEGACOAT NANO	MEGACOAT Cermet	Cermet		Carbide		Applicable Toolholders
		CW		CDX	RE	PR2015	PR2025	PR1215	PR1625	PV7040	TC40	TN90	KW10		
		in	mm			R L	R L	R L	R L	R L	R L	R L	R L		
 	GBA32 R/L 033-005 *1	0.013	0.33	0.8	0.05	● ●	● ●		● ●						
	050-005 *2*3	0.020	0.50	1.0	0.05							●		● ●	
		0.020	0.50	1.2	0.05	● ●	● ●	● ●	● ●						
	075-005	0.030	0.75	2.0	0.05	● ●	● ●	● ●	● ●	● ●		●		● ●	
	095-005	0.037	0.95	2.0	0.05	● ●	● ●	● ●	● ●			●		● ●	
	100-005	0.039	1.00	2.0	0.05	● ●	● ●	● ●	● ●	● ●		●	●	● ●	
	110-005	0.043	1.10	2.0	0.05	● ●	● ●		● ●						
	120-005	0.047	1.20	2.0	0.05	● ●	● ●	● ●	● ●						
	125-020	0.049	1.25	2.0	0.20	● ●	● ●	● ●	● ●	● ●		●	●	● ●	
	130-020	0.051	1.30	2.0	0.20	● ●	● ●	● ●	● ●						KGBA R/L ...-3 KGBA R/L ...-16 (JCT) KGBAS R/L ...-3 KGBAS R/L ...-16 KIGBA R/L ...-3 (Internal) KIGBA R/L ...-16 (Internal)
	140-020	0.055	1.40	2.5	0.20	● ●	● ●	● ●	● ●						
	145-020 *3	0.057	1.45	2.0	0.20							●		● ●	
		0.057	1.45	2.5	0.20	● ●	● ●	● ●	● ●						
	150-020 *3	0.059	1.50	2.0	0.20					● ●		●	●	● ●	
		0.059	1.50	2.5	0.20	● ●	● ●	● ●	● ●						
	160-020	0.063	1.60	2.5	0.20	● ●	● ●	● ●	● ●						
	170-020	0.067	1.70	2.5	0.20	● ●	● ●	● ●	● ●						
	175-020 *3	0.069	1.75	2.0	0.20							●	●	● ●	
		0.069	1.75	2.5	0.20	● ●	● ●	● ●	● ●						
	200-020	0.079	2.00	2.5	0.20	● ●	● ●	● ●	● ●	● ●		●	●	● ●	
	225-020	0.089	2.25	2.5	0.20	● ●	● ●	● ●	● ●						
	250-020	0.098	2.50	2.5	0.20	● ●	● ●	● ●	● ●			●	●	● ●	
	300-020	0.118	3.00	2.5	0.20	● ●	● ●	● ●	● ●						
	GBA43 R/L 125-010	0.049	1.25	2.0	0.10	● ●	● ●	● ●	● ●						KGBA R/L ...-4-15 KGBA R/L ...22-15 (JCT) KGBAS R/L ...-4-15 KGBAS R/L ...22-15 KIGBA R/L ...-4 (Internal) KIGBA R/L ...22 (Internal)
	125-020	0.049	1.25	2.0	0.20	● ●	● ●	● ●	● ●	● ●	● ●	●	●	● ●	
	140-020	0.055	1.40	3.5	0.20	● ●	● ●	● ●	● ●						
	145-020 *3	0.057	1.45	2.0	0.20						● ●	●	●	● ●	
		0.057	1.45	3.5	0.20	● ●	● ●	● ●	● ●						
	150-010	0.059	1.50	3.5	0.10	● ●	● ●	● ●	● ●						
	150-020	0.059	1.50	3.5	0.20	● ●	● ●	● ●	● ●	● ●	● ●	●	●	● ●	
	170-020	0.067	1.70	3.5	0.20	● ●	● ●	● ●	● ●						
	175-020	0.069	1.75	3.5	0.20	● ●	● ●	● ●	● ●		●		●	● ●	
	185-020	0.073	1.85	3.5	0.20	● ●	● ●	● ●	● ●		● ●	●		● ●	
	195-020	0.077	1.95	3.5	0.20	● ●	● ●		● ●						
	200-010	0.079	2.00	3.5	0.10	● ●	● ●	● ●	● ●						
	200-020	0.079	2.00	3.5	0.20	● ●	● ●	● ●	● ●	● ●		●	●	● ●	
	225-020	0.089	2.25	3.5	0.20	● ●	● ●	● ●	● ●						
	230-020	0.091	2.30	3.5	0.20	● ●	● ●	● ●	● ●		● ●	●	●	● ●	
	250-010	0.098	2.50	5.0	0.10	● ●	● ●	● ●	● ●						★1
	250-030 *3	0.098	2.50	4.0	0.30					● ●	● ●	●	●	● ●	★2
		0.098	2.50	5.0	0.30	● ●	● ●	● ●	● ●						★1
	265-030 *3	0.104	2.65	4.0	0.30						●	●	●	● ●	★2
		0.104	2.65	5.0	0.30	● ●	● ●	● ●	● ●						★1
	280-030 *3	0.110	2.80	4.0	0.30						●	●	●	● ●	★2
		0.110	2.80	5.0	0.30	● ●	● ●	● ●	● ●						★1
	300-010	0.118	3.00	5.0	0.10	● ●	● ●	● ●	● ●						
	300-030 *3	0.118	3.00	4.0	0.30					● ●	● ●	●	●	● ●	★2
		0.118	3.00	5.0	0.30	● ●	● ●	● ●	● ●						★1
	325-030	0.128	3.25	5.0	0.30	●	●		●						★2
	330-030 *3	0.130	3.30	4.0	0.30						● ●	●		● ●	
		0.130	3.30	5.0	0.30	● ●	● ●	● ●	● ●						★1
	GBA43 R/L 350-010	0.138	3.50	5.0	0.10	● ●	● ●	● ●	● ●						KGBA R/L ...-4-35 KGBA R/L ...22-35 (JCT) KGBAS R/L ...-4-35 KGBAS R/L ...22-35 KIGBA R/L ...-4 (Internal) KIGBA R/L ...22 (Internal)
	350-030	0.138	3.50	5.0	0.30	● ●	● ●	● ●	● ●		● ●	●	●	● ●	
	400-010	0.157	4.00	5.0	0.10	● ●	● ●	● ●	● ●						
	400-040	0.157	4.00	5.0	0.40	● ●	● ●	● ●	● ●	● ●	● ●	●	●	● ●	
	430-040	0.169	4.30	5.0	0.40	● ●	● ●	● ●	● ●		●		●	● ●	
	450-040	0.177	4.50	5.0	0.40	● ●	● ●	● ●	● ●		●		●	● ●	
	480-040	0.189	4.80	5.0	0.40	● ●	● ●	● ●	● ●				●	● ●	

*1 : The edge width tolerance of GBA32 R/L 033-005 : 0.33 $^{+0.02mm}_{-0.03mm}$
*2 : The edge width tolerance of GBA32 R/L 050-005 : 0.50 $^{+0.05mm}_{-0.00mm}$
*3 : Available grooving depth is different based on grade

Dimension CDX shows available grooving depth

● : Standard Item

Recommended Cutting Conditions P16

★1: KGBA R/L ...4-25, KGBA R/L ...22-25 (JCT), KGBA R/L ...22-25T5, KGBAS R/L ...22-25T5, KIGBA R/L ...4, KIGBA R/L ...22

★2: KGBA R/L ...4-25, KGBA R/L ...22-25 (JCT), KGBA R/L ...22-25T5, KGBAS R/L ...4-25, KGBAS R/L ...22-25, KGBAS R/L ...22-25T5, KIGBA R/L ...4, KIGBA R/L ...22

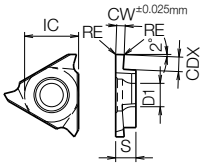
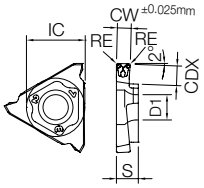
Inserts sold in 10 piece boxes

GBA Inserts (Metric Size)

Part Number	IC		S		D1	
	in	mm	in	mm	in	mm
GBA R/L 32...	3/8	9.525	1/8	3.18	0.173	4.4
GBA R/L 43...	1/2"	12.7	3/16	4.76	0.217	5.5
GBA43 R/L 480...			0.197	5.00	0.217	5.5

		NEW	NEW			
P	Carbon Steel / Alloy Steel	●	◕	○	◔	●
M	Stainless Steel		◕	○	◔	
K	Cast Iron	◕		◔		
N	Non-ferrous Metals					
S	Titanium Alloy					
H	Hardened Materials					

Classification of Usage
◕ : Light Interruption / 1st Choice
◔ : Light Interruption / 2nd Choice
● : Continuous / 1st Choice
○ : Continuous / 2nd Choice

Insert Right-handed Insert Shown		Part Number		Dimensions (mm) CW in	CW mm	CDX	RE	MEGACOAT NANO EX PR2015 R	PR2015 L	PR2025 R	PR2025 L	MEGACOAT PR1215 R	PR1215 L	MEGACOAT NANO PR1625 R	PR1625 L	Cermet TN620 R	TN620 L	Applicable Toolholders
 Sharp Edge		GBA32R/L	050-005F *1	0.020	0.50	1.0	0.05									●	●	KGBAR/L...-3 KGBAR/L...-16 KGBASR/L...-3 KGBASR/L...-16 KIGBAR/L...-3 (Internal) KIGBAR/L...-16 (Internal)
			075-005F	0.030	0.75	2.0	0.05									●	●	
			095-005F	0.037	0.95	2.0	0.05									●	●	
			100-005F	0.039	1.00	2.0	0.05									●	●	
			125-020F	0.049	1.25	2.0	0.2									●	●	
			145-020F	0.057	1.45	2.0	0.2									●	●	
			150-020F	0.059	1.50	2.0	0.2									●	●	
			175-020F	0.069	1.75	2.0	0.2									●	●	
			200-020F	0.079	2.00	2.5	0.2									●	●	
			250-020F	0.098	2.50	2.5	0.2									●	●	
		GBA43R/L	125-020F	0.049	1.25	2.0	0.2									●	●	KGBAR/L...-4-15 KGBAR/L...22-15 (JCT) KGBASR/L...-4-15 KGBASR/L...22-15 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			145-020F	0.057	1.45	2.0	0.2									●	●	
			150-020F	0.059	1.50	3.5	0.2									●	●	
			175-020F	0.069	1.75	3.5	0.2									●	●	
			185-020F	0.073	1.85	3.5	0.2									●	●	
			200-020F	0.079	2.00	3.5	0.2									●	●	
			230-020F	0.091	2.30	3.5	0.2									●	●	
			250-030F	0.098	2.50	4.0	0.3									●	●	KGBAR/L...4-25 KGBAR/L...22-25 (JCT) KGBAR/L...22-25T5 KGBASR/L...4-25 KGBASR/L...22-25 KGBASR/L...22-25T5 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			265-030F	0.104	2.65	4.0	0.3									●	●	
			280-030F	0.110	2.80	4.0	0.3									●	●	
			300-030F	0.118	3.00	4.0	0.3									●	●	
			330-030F	0.130	3.30	4.0	0.3									●	●	
			350-030F	0.138	3.50	5.0	0.3									●	●	KGBAR/L...-4-35 KGBAR/L...22-35 (JCT) KGBASR/L...-4-35 KGBASR/L...22-35 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			400-040F	0.157	4.00	5.0	0.4									●	●	
			430-040F	0.169	4.30	5.0	0.4									●		
			450-040F	0.177	4.50	5.0	0.4									●		
			480-040F	0.189	4.80	5.0	0.4									●		
Molded Chipbreaker GM Chipbreaker 		GBA43R/L	140-010GM	0.055	1.40	3.5	0.10	●	●	●	●	●	●	●	●	●	●	
			150-020GM	0.059	1.50	3.5	0.20	●	●	●	●	●	●	●	●	●	●	KGBAR/L...-4-15 KGBAR/L...22-15 (JCT) KGBASR/L...-4-15 KGBASR/L...22-15 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			175-020GM	0.069	1.75	3.5	0.20	●	●	●	●	●	●	●	●	●	●	
			185-020GM	0.073	1.85	3.5	0.20	●	●	●	●	●	●	●	●	●	●	
			200-020GM	0.079	2.00	3.5	0.20	●	●	●	●	●	●	●	●	●	●	
			230-020GM	0.091	2.30	3.5	0.20	●	●	●	●	●	●	●	●	●	●	
			250-030GM	0.098	2.50	5.0	0.30	●	●	●	●	●	●	●	●	●	●	KGBAR/L...22-25 (JCT) KGBAR/L...22-25T5 KGBASR/L...22-25T5 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			265-030GM	0.104	2.65	5.0	0.30	●	●	●	●	●	●	●	●	●	●	
			300-030GM	0.118	3.00	5.0	0.30	●	●	●	●	●	●	●	●	●	●	
			330-030GM	0.130	3.30	5.0	0.30	●	●	●	●	●	●	●	●	●	●	
			350-030GM	0.138	3.50	5.0	0.30	●	●	●	●	●	●	●	●	●	●	KGBAR/L...-4-35 KGBAR/L...22-35 (JCT) KGBASR/L...-4-35 KGBASR/L...22-35 KIGBAR/L...-4 (Internal) KIGBAR/L...22 (Internal)
			400-040GM	0.157	4.00	5.0	0.40	●	●	●	●	●	●	●	●	●	●	

Dimension CDX shows available grooving depth

*1 : The edge width tolerance of GBA32R/L 050-005F : 0.50mm $^{+0.25mm}_{-0.00m}$

● : Standard Item

Recommended Cutting Conditions ➡ P16

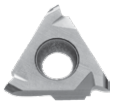
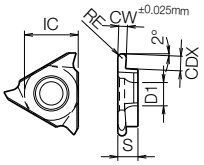
Inserts sold in 10 piece boxes

GBA Inserts (Metric Size)

Part Number	IC		S		D1	
	in	mm	in	mm	in	mm
GBA□32...	3/8	9.525	1/8	3.18	0.173	4.4
GBA□43...	1/2"	12.7	3/16	4.76	0.217	5.5

		MEGACOAT NANO EX		MEGACOAT	MEGACOAT NANO	MEGACOAT Cermet	Cermet		Carbide
P	Carbon Steel / Alloy Steel	●	●	○	◔	●			
M	Stainless Steel		●	○	◔				
K	Cast Iron	●		◔					◔
N	Non-ferrous Metals								●
S	Titanium Alloy								●
H	Hardened Materials								

Classification of Usage
● : Light Interruption / 1st Choice
◔ : Light Interruption / 2nd Choice
● : Continuous / 1st Choice
○ : Continuous / 2nd Choice

Insert (Right-handed Insert Shown)	Part Number		Dimensions (mm) CW in	CW mm	CDX	RE	PR2015 R	PR2015 L	PR2025 R	PR2025 L	PR1215 R	PR1215 L	PR1625 R	PR1625 L	PV7040 R	PV7040 L	TN620 R	TN620 L	TN90 R	TN90 L	KW10 R	KW10 L	Applicable Toolholders
 RF : Sharp Edge  Full-R (Round)		GBA32R	200-100R	0.079	2.00	2.5	1.00	●		●		●		●										KGBA□...-3 KGBA□...-16 (JCT) KGBAS□...-3 KGBAS□...-16 KIGBA□...-3 (Internal) KIGBA□...-16 (Internal)
			300-150R	0.118	3.00	2.5	1.50	●		●		●		●									
		GBA43□	100-050R	0.039	1.00	2.0	0.50	●	●	●	●	●	●	●	●	●							KGBA□...-4-15 KGBA□...22-15 (JCT) KGBAS□...-4-15 KGBAS□...22-15 KIGBA□...-4 (Internal) KIGBA□...22 (Internal)
			150-075R	0.059	1.50	3.5	0.75	●	●	●	●	●	●	●	●	●			●		●		
			200-100R	0.079	2.00	3.5	1.00	●	●	●	●	●	●	●	●	●							
			250-125R	0.098	2.50	4.0	1.25	●	●	●	●	●	●	●	●									KGBA□...-4-25 KGBA□...22-25 (JCT) KGBA□...22-25T5 KGBAS□...-4-25 KGBAS□...22-25 KGBAS□...22-25T5 KIGBA□...-4 KIGBA□...22
			300-150R	0.118	3.00	4.0	1.50	●	●	●	●	●	●	●	●				●	●	●	●	
			400-200R	0.157	4.00	5.0	2.00	●	●	●	●	●	●	●	●								KGBA□...-4-35 KGBA□...22-35 (JCT) KGBAS□...-4-35 KGBAS□...22-35 KIGBA□...-4 (Internal) KIGBA□...22 (Internal)
		GBA43□	100-050RF	0.039	1.00	2.0	0.50										●	●					KGBA□...-4-15 KGBA□...22-15 (JCT) KGBAS□...-4-15 KGBAS□...22-15 KIGBA□...-4 (Internal) KIGBA□...22 (Internal)
			150-075RF	0.059	1.50	3.5	0.75										●	●					
			200-100RF	0.079	2.00	3.5	1.00										●	●					
			250-125RF	0.098	2.50	4.0	1.25										●	●					KGBA□...-4-25 KGBA□...22-25 (JCT) KGBA□...22-25T5 KGBAS□...-4-25 KGBAS□...22-25 KGBAS□...22-25T5 KIGBA□...-4 KIGBA□...22
			300-150RF	0.118	3.00	4.0	1.50										●	●					KGBA□...-4-35 KGBA□...22-35 (JCT) KGBAS□...-4-35 KGBAS□...22-35 KIGBA□...-4 (Internal) KIGBA□...22 (Internal)
			400-200RF	0.157	4.00	5.0	2.00										●						

Dimension CDX shows available grooving depth
*MC stands for MEGACOAT Cermet.

● : Standard Item

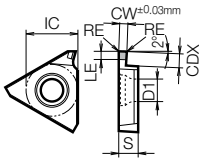
Recommended Cutting Conditions ➡ P16

Inserts sold in 10 piece boxes

GBA Inserts (Metric Size)

Part Number	IC		S		D1	
	in	mm	in	mm	in	mm
GBA R/L 32...	3/8	9.525	1/8	3.18	0.173	4.4
GBA R/L 43...	1/2"	12.7	3/16	4.76	0.217	5.5

P	Carbon Steel / Alloy Steel						Classification of Usage ●: Light Interruption / 1st Choice ◔: Light Interruption / 2nd Choice ●: Continuous / 1st Choice ○: Continuous / 2nd Choice
M	Stainless Steel						
K	Cast Iron						
N	Non-ferrous Metals			●			
S	Titanium Alloy			●			
H	Hardened Materials	○	●				

Insert Right-handed Insert Shown		Part Number		Dimensions (mm)				CBN				PCD				Applicable Toolholders
				CW		CDX	RE	KBN510		KBN525		KPD001		KPD010		
				in	mm			R	L	R	L	R	L	R	L	
1-Edge	 GBA32 LE=1.7mm GBA43 LE=1.9mm	**GBA32R**	**125-010**	0.049	1.25	2.0	0.1					●		●		KGBA R/L...-3 KGBA R/L...-16 (JCT) KGBAS R/L...-3 KGBAS R/L...-16 KIGBA R/L...-3 (Internal) KIGBA R/L...-16 (Internal)
			150-010	0.059	1.50	2.0	0.1					●		●		
			200-010	0.079	2.00	2.0	0.1					●				
		GBA43 R/L	**125-010**	0.049	1.25	2.0	0.1							●	●	KGBA R/L...-4-15 KGBA R/L...22-15 (JCT) KGBAS R/L...-4-15 KGBAS R/L...22-15 KIGBA R/L...-4 (Internal) KIGBA R/L...22 (Internal)
			125-020	0.049	1.25	2.0	0.2	●			●					
			150-010	0.059	1.50	3.5	0.1					●	●	●	●	
			150-020	0.059	1.50	3.5	0.2	●	●	●						
			200-010	0.079	2.00	3.5	0.1					●	●	●	●	
			200-020	0.079	2.00	3.5	0.2	●	●	●	●					
			250-010	0.098	2.50	4.0	0.1					●	●	●	●	KGBA R/L...-4-25 KGBA R/L...22-25 (JCT) KGBA R/L...22-25T5 KGBAS R/L...-4-25 KGBAS R/L...22-25 KGBAS R/L...22-25T5 KIGBA R/L...-4 KIGBA R/L...22
			300-010	0.118	3.00	4.0	0.1					●	●	●		
			300-020	0.118	3.00	4.0	0.2			●						

Dimension CDX shows available grooving depth

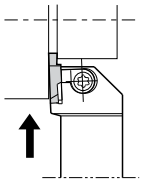
● : Standard Item

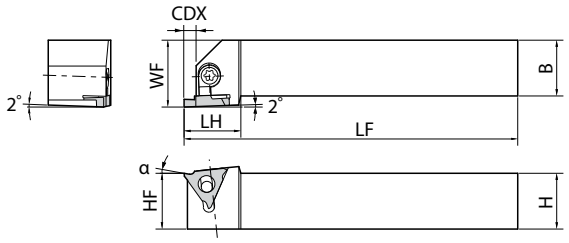
Recommended Cutting Conditions P16

CBN & PCD Inserts sold in 1 piece boxes

KGBA / KGBAS Toolholders

KGBA

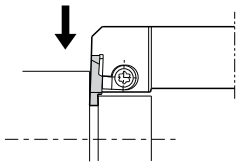


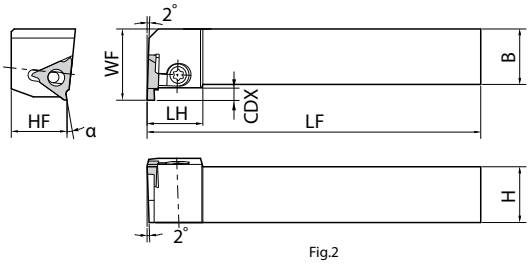


· Right-hand Shown
· R-hand Insert for R-hand Toolholder,
L-hand Insert for L-hand Toolholder.

Fig.1

KGBAS





· Right-hand Shown
· L-hand Insert for R-hand Toolholder,
R-hand Insert for L-hand Toolholder.

Fig.2

Toolholder Dimensions (Inch)

Part Number		Stock		Dimensions (in)								Spare Parts		Applicable Inserts
												Clamp Set	Wrench	
		R	L	H	HF	B	LF	LH	WF	CDX	Drawing			
KGBAR/L	**12-3**	●	●	0.750	0.750	0.750	5.000	0.945	1.000	0.098	Fig.1	LGBA-16R/L S	FT-15	GBA32R/L
	16-3	●	●	1.000	1.000	1.000	6.000		1.250					
	12-4-15	●	●	0.750	0.750	0.750	5.000	1.004	1.000	0.157		LGBA-22R/L S	FT-15	GBA43R/L
	16-4-15	●	●	1.000	1.000	1.000	6.000		1.250					
	12-4-25	●	●	0.750	0.750	0.750	5.000	1.004	1.000	0.177				
	16-4-25	●	●	1.000	1.000	1.000	6.000		1.250					
	12-4-35	●	●	0.750	0.750	0.750	5.000	1.004	1.000	0.217				
	16-4-35	●	●	1.000	1.000	1.000	6.000		1.250					
KGBASR	**12-3**	●		0.750	0.750	0.750	5.000	0.984	0.984	0.098	Fig.2	LGBA-16LS	FT-15	GBA32L
	16-3	●		1.000	1.000	1.000	6.000		1.181					
	12-4-15	●		0.750	0.750	0.750	5.000	0.984	1.062	0.157		LGBA-22LS	FT-15	GBA43L
	16-4-15	●		1.000	1.000	1.000	6.000		1.260					
	12-4-25	●		0.750	0.750	0.750	5.000	0.984	1.062	0.177				
	16-4-25	●		1.000	1.000	1.000	6.000		1.250					
	12-4-35	●		0.750	0.750	0.750	5.000	0.984	1.062	0.217				
	16-4-35	●		1.000	1.000	1.000	6.000		1.260					

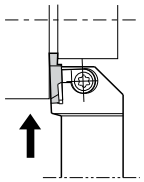
CDX shows the distance from the toolholder to the cutting edge. For available groove depth, see "CDX" dimension of Insert.

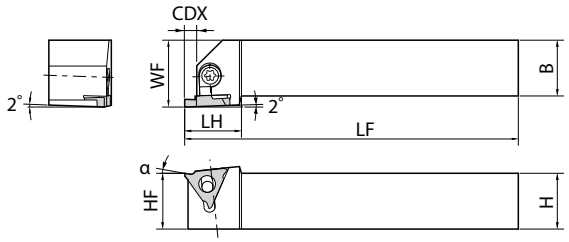
● : Standard Item

* Short Shank Type Clamp Set : KGBAR/L…LGBA-○○RS for Right-hand Toolholder, and LGBA-○○LS for Left-hand Toolholder.
KGBASR/L…LGBA-○○LS for Right-hand Toolholder, and LGBA-○○RS for Left-hand Toolholder.

KGBA / KGBAS Toolholders

KGBA

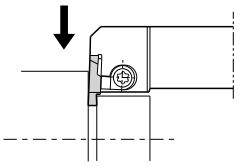


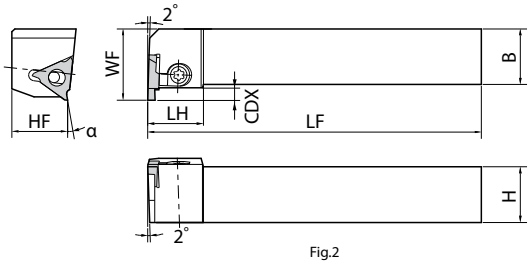


· Right-hand Shown
· R-hand Insert for R-hand Toolholder, L-hand Insert for L-hand Toolholder.

Fig.1

KGBAS





· Right-hand Shown
· L-hand Insert for R-hand Toolholder, R-hand Insert for L-hand Toolholder.

Fig.2

Toolholder Dimensions (Metric)

Part Number		Stock		Dimensions (mm)								Spare Parts		Applicable Inserts
												Clamp Set	Wrench	
		R	L	H	HF	B	LF	LH	WF	CDX	Drawing			
KGBA R/L	2020K-16	●	●	20	20	20	125	24	25	2.5	Fig.1	LGBA-16 R/L S	FT-15	GBA32 R/L
	2525M-16	●	●	25	25	25	150		30					
	2020K22-15	●	●	20	20	20	125	25.5	25	4.0		LGBA-22 R/L S	FT-15	GBA43 R/L
	2525M22-15	●	●	25	25	25	150		30					
	2020K22-25	●	●	20	20	20	125	25.5	25	4.5				
	2525M22-25	●	●	25	25	25	150		30					
	2020K22-25T5	●	●	20	20	20	125	25.5	25	5.5				
	2525M22-25T5	●	●	25	25	25	150		30					
	2020K22-35	●	●	20	20	20	125	25.5	25					
	2525M22-35	●	●	25	25	25	150		30					
KGBA R/L	2020H22-15*	●		20	20	20	100	25.5	25	4.0				
	2020H22-25*	●								4.5				
	2020H22-35*	●								5.5				
KGBAS R/L	2020K-16	●	●	20	20	20	125	25	25	2.5	Fig.2	LGBA-16 R/L S	FT-15	GBA32 R/L
	2525M-16	●	●	25	25	25	150		30					
	2020K22-15	●	●	20	20	20	125	25	27	4.0		LGBA-22 R/L S	FT-15	GBA43 R/L
	2525M22-15	●	●	25	25	25	150		32					
	2020K22-25	●	●	20	20	20	125	25	27	4.5				
	2525M22-25	●	●	25	25	25	150		32					
	2020K22-25T5	●	●	20	20	20	125	25	27	5.5				
	2525M22-25T5	●	●	25	25	25	150		32					
	2020K22-35	●	●	20	20	20	125	25	27					
	2525M22-35	●	●	25	25	25	150		32					

CDX shows the distance from the toolholder to the cutting edge. For available groove depth, see "CDX" dimension of Insert.

● : Standard Item

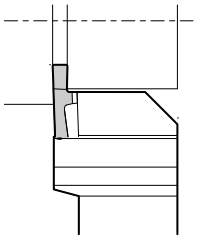
* Short Shank Type Clamp Set : KGBA R/L …LGBA-○○RS for Right-hand Toolholder, and LGBA-○○LS for Left-hand Toolholder.
KGBAS R/L …LGBA-○○LS for Right-hand Toolholder, and LGBA-○○RS for Left-hand Toolholder.

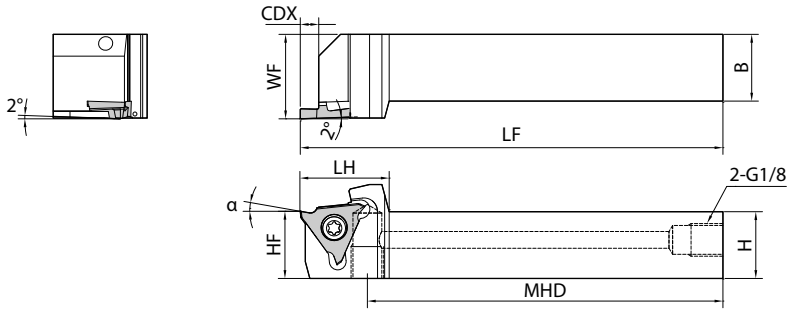
External Grooving Toolholders KGBA Short Shank Types are Available

For NC lathe, KGBAR2020K-○○ (Overall length 125mm) short shank type KGBAR2020H22-○○ (Overall length 100mm) is available. No longer requires the user to cut the shank portion.

KGBA-JCT (Shallow Grooving)

KGBA-JCT





Right-hand (R) Shown

R-Hand Insert for R-Hand Toolholder

Toolholder Dimensions (Metric)

Pressure Resistance: up to 4,350 psi

Part Number		Stock		Dimensions (mm)								Spare Parts				Applicable Inserts
												Clamp Screw	Wrench		Plug	
		R	L	H	HF	B	LF	LH	WF	CDX	MHD					
KGBA R/L	2020K-16JCT	●	●	20	20	20	125	24.0	25	2.5	107.5	SB-4085TR	FT-15	-	HSG1/8x8.0	GBA32 R/L
	2525K-16JCT	●	●	25	25	25			30							
	2020K22-15JCT	●	●	20	20	20		26.5	25	4	105	SB-5085TR	-	LTW-20		GBA43 R/L
	2525K22-15JCT	●	●	25	25	25			30							
	2020K22-25JCT	●	●	20	20	20			25	5.5						
	2525K22-25JCT	●	●	25	25	25			30							
	2020K22-35JCT	●	●	20	20	20			25							
	2525K22-35JCT	●	●	25	25	25			30							

See ➔ **Page 14** for piping parts

● : Standard Item

CDX shows the distance from the toolholder to the cutting edge. For available groove depth, see "CDX" dimension of Insert.

KGBA-JCT Toolholder is Screw Clamp Type

Insert Rake Angles when Installed in KGBA Holders

Rake Angle (α) After Installment of GBA Inserts

(External Grooving Toolholders)

GBA32 R/L ○○○N / GBA32 R/L ○○○-○○○		**GBA43 R/L ○○○N / GBA43 R/L ○○○-○○○**		**GBA43 R/L ○○○-○○○R** (Full-R)		
α	Insert Grade	α	Insert Grade	α	Insert Grade	Full-R Part Number
10°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625 KPD001, KPD010	0°	KBN510, KBN525	10°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625	050R ~ 150R
		10°	TN620, TC40N, TN90, PV7040 PR2015, PR2025, PR1215, PR1625 KPD001, KPD010	14°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625	200R
20°	KW10	20°	KW10	14°	KW10	050R ~ 200R

Rake Angle (α) After Installment of GBA-GM Inserts

(External Grooving Toolholders)

α	Insert Part Number	α	Insert Part Number
+10°	GBA43 R/L 150-020GM	+12°	GBA43 R/L 300-030GM ~ GBA43 R/L 400-040GM
+15°	GBA43 R/L 175-020GM ~ GBA43 R/L 265-030GM		

Rake Angle (α) After Installment of GBA-MY(N) Inserts

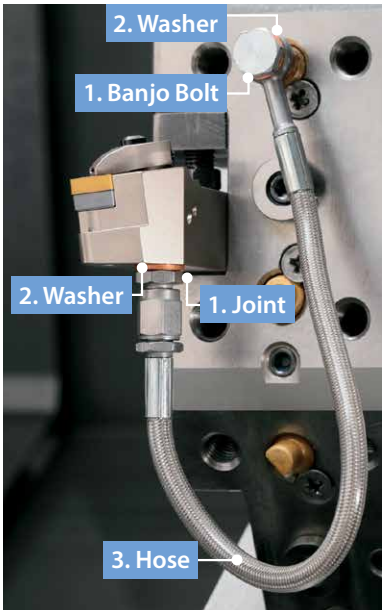
(External Grooving Toolholders)

α	Insert Part Number	
+15°	GBA43 R/L 078MYN ~ GBA43 R/L 125MYN	GBA43 R/L 175-020MY ~ GBA43 R/L 350-030MY
+14°	GBA43 R/L 156MY	GBA43 R/L 400-040MY

α shows the rake angle at the center of the edge width after installing insert

Easy Coolant Connections

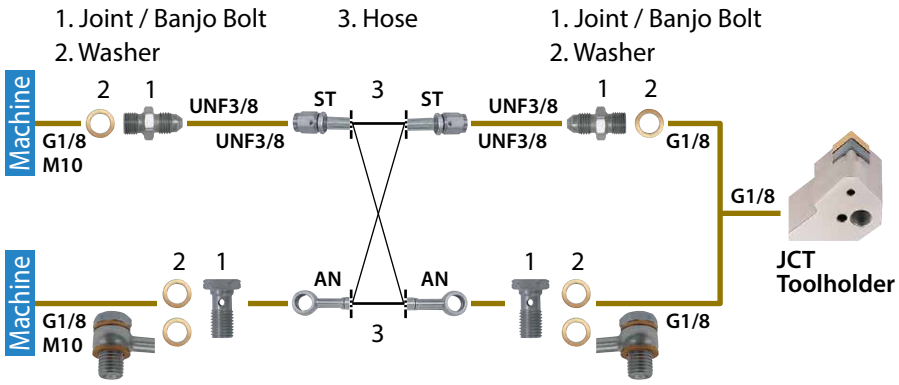
Easy Connection with High Pressure Hose and Joint



· Even without a high pressure pump, internal coolant can be used at a normal pressure

· Banjo bolt available for angled hose connection and can be used in a variety of machines

Piping Installation Guide



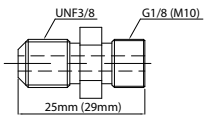
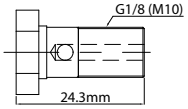
Piping Parts

Optional Piping Parts Available
Choose from parts below to match your machine specifications

1. Joint / Banjo bolt × 2
2. Washer × 2-4
3. Hose × 1

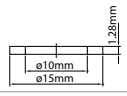
1. Joint / Banjo Bolt

Pressure Resistance: up to 4,350 psi

Shape		Part Number	Stock	Thread Standard
		**J-G1/8-UNF3/8**	●	G1/8
		J-M10X1.5-UNF3/8	●	M10X1.5
Banjo Bolt (for Angle Hose) 		**BB-G1/8**	●	G1/8
		BB-M10X1.5	●	M10X1.5

2. Washer

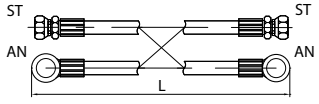
Pressure Resistance: up to 4,350 psi

Shape		Part Number	Stock
		**WS-10**	●

* Use 2 washers for a banjo bolt

3. Hose

Pressure Resistance: up to 4,350 psi

Shape		Part Number	Stock	Thread Standard		Dimensions (mm) L
		**HS-ST-ST-200**	●	UNF3/8	UNF3/8	200
		HS-ST-ST-250	●			250
		HS-ST-AN-200	●	UNF3/8	- (Banjo Bolt)	200
		HS-ST-AN-250	●			250
		HS-AN-AN-200	●	- (Banjo Bolt)	- (Banjo Bolt)	200
		HS-AN-AN-250	●			250

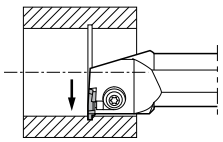
● : Standard Item

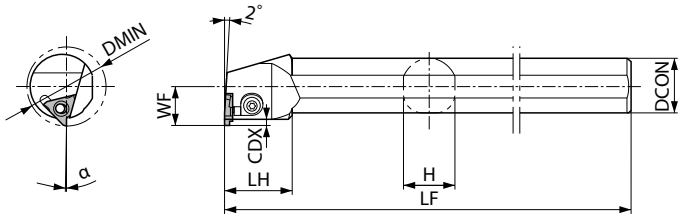
Precautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are the same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.

KIGBA Toolholders

KIGBA





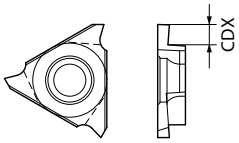
· Right-hand Shown
· L-hand Insert for R-hand Toolholder,
R-hand Insert for L-hand Toolholder.

Toolholder Dimensions (Inch / Metric)

Part Number		Stock		Unit	Min. Bore Dia.	Dimensions						Spare Parts		Applicable Inserts
												Clamp Set	Wrench	
		R	L		DMIN	DCON	H	LF	LH	WF	*CDX			
KIGBA R/L	16-3	●	●	inch	1.38	1.00	0.92	9.0	1.18	0.69	0.12	LGBA-16R/L S	FT-15	GBA32R/L
	20-4	●	●		1.57	1.25	1.18	10.0	1.18	0.90	0.12	LGBA-22R/L S		GBA43R/L
KIGBA R/L	3525-16	●	●	mm	35	25	23	220	30	17.5	2.8	LGBA-16R/L S		GBA32R/L
	4032-22	●	●		40	32	30	250	30	23.0	3.0	LGBA-22R/L S		GBA43R/L

● : Standard Item

∗Dimension CDX shows the distance from the toolholder to the cutting edge.
Available grooving depth depends on the insert.
KIGBA R/L 3525-16 : Dimension CDX of the applicable insert (GBA32 Type)
4032-22 : Dimension CDX of the applicable insert (GBA43 Type)
① 2.0 mm (Dimension CDX < 3.0mm)
② 3.0 mm (Dimension CDX ≥ 3.0mm)



Clamp Set : LGBA-○○LS for Right-hand Toolholder, and LGBA-○○RS for Left-hand Toolholder.

Insert Rake Angles when Installed in KIGBA Holders

Rake Angle (α) After Installment of GBA Inserts
Internal Grooving Holders (KIGBA)

GBA32R/L○○○N / GBA32R/L○○○-○○○		**GBA43R/L○○○N / GBA43R/L○○○-○○○**		**GBA43R/L○○○-○○○R** (Full-R)		
α	Insert Grade	α	Insert Grade	α	Insert Grade	Full-R
+1°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625 KPD001, KPD010	-9°	KBN510, KBN525	+1°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625	050R ~ 150R
		+1°	TN620, TC40N, TN90, PV7040 PR2015, PR2025, PR1215, PR1625 KPD001, KPD010	+5°	TN620, TN90, PV7040 PR2015, PR2025, PR1215, PR1625	200R
+11°	KW10	+11°	KW10	+5°	KW10	050R ~ 200R

Rake Angle (α) After Installment of GBA-GM Inserts
Internal Grooving Holders (KIGBA)

α	Insert Part Number	α	Insert Part Number
+1°	GBA43R/L 150-020GM	+3°	GBA43R/L 300-030GM ⌇ GBA43R/L 400-040GM
+6°	GBA43R/L 175-020GM ⌇ GBA43R/L 265-030GM		

α shows the rake angle at the center of the edge width after installing insert

Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

GBA Inserts (Ground Chipbreaker)

Workpiece	Recommended Insert Grades (Cutting Speed Vc : sfm)											(1) f (feed) for Grooving (ipr) (2) f (feed) for Traversing (ipr) (3) D.O.C. for Traversing (in)					Notes
	MEGACOAT NANO EX		MEGA COAT	MEGA COAT NANO	MEGA COAT Cermet	Cermet			Carbide	CBN	PCD						
	PR2015	PR2025	PR1215	PR1625	PV7040	TN620	TC40	TN90	KW10	KBN510 KBN525	KPD001 (KPD010)	GBA○○R/L 031N ~ 041N 033... ~ 100...	GBA○○R/L 047N ~ 078N 125... ~ 200...	GBA○○R/L 094N ~ 109N 230... ~ 300...	GBA○○R/L 125N ~ 156N 330... ~ 400...	GBA○○R/L 172N ~ 188N 400... ~ 480...	
Carbon Steel	★ 260 - 660	★ 260 - 590	☆ 260 - 660	☆ 260 - 590	☆ 490 - 790	★ 260 - 720	☆ 490 - 720	☆ 490 - 720	-	-	-	(1) 0.0012 - 0.0031 (2) Not Recommended (3) Not Recommended	(1) 0.0016 - 0.0035 (2) 0.0016 - 0.0035 (3) Max. 0.0118	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0315	Wet
Alloy Steel	★ 260 - 590	☆ 260 - 520	☆ 260 - 590	☆ 260 - 520	☆ 430 - 720	★ 260 - 660	☆ 430 - 660	☆ 430 - 660	-	-	-	(1) 0.0012 - 0.0028 (2) Not Recommended (3) Not Recommended	(1) 0.0016 - 0.0031 (2) 0.0016 - 0.0031 (3) Max. 0.0118	(1) 0.0020 - 0.0035 (2) 0.0020 - 0.0035 (3) Max. 0.0197	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0315	
Stainless Steel	☆ 200 - 490	★ 200 - 430	☆ 200 - 490	☆ 200 - 430	-	-	-	☆ 230 - 490	-	-	-	(1) 0.0012 - 0.0028 (2) Not Recommended (3) Not Recommended	(1) 0.0016 - 0.0031 (2) 0.0016 - 0.0031 (3) Max. 0.0118	(1) 0.0020 - 0.0035 (2) 0.0020 - 0.0035 (3) Max. 0.0197	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0315	
Cast Iron	★ 260 - 590	-	-	-	-	-	-	-	☆ 200 - 390	★ 490 - 1,310	-	(1) 0.0012 - 0.0031 (2) Not Recommended (3) Not Recommended	(1) 0.0016 - 0.0035 (2) 0.0016 - 0.0035 (3) Max. 0.0118	(1) 0.0020 - 0.0039 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0315	
Aluminum	-	-	-	-	-	-	-	-	★ 490 - 1,310	-	★ 490 - 6,560	(1) 0.0020 - 0.0047 (2) Not Recommended (3) Not Recommended	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0059 (3) Max. 0.0197	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0059 (3) Max. 0.0315	(1) 0.0031 - 0.0059 (2) 0.0031 - 0.0059 (3) Max. 0.0315	(1) 0.0031 - 0.0059 (2) 0.0031 - 0.0059 (3) Max. 0.0315	
Brass	-	-	-	-	-	-	-	-	★ 490 - 980	-	★ 660 - 2,620	(1) 0.0020 - 0.0047 (2) Not Recommended (3) Not Recommended	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0059 (3) Max. 0.0197	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0059 (3) Max. 0.0315	(1) 0.0031 - 0.15 (2) 0.0031 - 0.15 (3) Max. 0.0315	(1) 0.0031 - 0.0059 (2) 0.0031 - 0.0059 (3) Max. 0.0315	
Hard materials	-	-	-	-	-	-	-	-	-	★ 260 - 390	-	-	(1) 0.0008 - 0.0020 (2) Not Recommended (3) Not Recommended	(1) 0.0012 - 0.0028 (2) 0.0004 - 0.0016 (3) Max. 0.0039	-	-	

Above cutting conditions are for external grooving. Set both cutting speed and feed rate 10% lower for internal grooving.

GBA Inserts (GM Chipbreaker)

Workpiece	Recommended Insert Grades (Cutting Speed Vc : sfm)					(1) f (feed) for Grooving (ipr) (2) f (feed) for Traversing (ipr) (3) D.O.C. for Traversing (in)					Notes
	MEGACOAT NANO EX		MEGACOAT	MEGACOAT NANO	Cermet						
	PR2015	PR2025	PR1215	PR1625	TN620	GBA43R/L 140-010GM	GBA43R/L 150-020GM	GBA43R/L 175-020GM ~ 230-020GM	GBA43R/L 250-030GM ~ 350-030GM	GBA43R/L 400-040GM	
Carbon Steel	★ 260 - 720	★ 260 - 720	☆ 260 - 720	☆ 260 - 720	★ 260 - 790	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0031 (3) Max. 0.0079	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0031 (3) Max. 0.0118	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0035 (3) Max. 0.0118	(1) 0.0016 - 0.0059 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0039 (3) Max. 0.0315	Wet
Alloy Steel	★ 260 - 660	★ 260 - 660	☆ 260 - 660	☆ 260 - 660	★ 260 - 720	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0031 (3) Max. 0.0079	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0031 (3) Max. 0.0118	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0035 (3) Max. 0.0118	(1) 0.0016 - 0.0059 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0020 - 0.0059 (2) 0.0020 - 0.0039 (3) Max. 0.0315	
Stainless Steel	☆ 200 - 490	★ 200 - 490	☆ 200 - 490	☆ 200 - 490	-	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0031 (3) Max. 0.0079	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0031 (3) Max. 0.0118	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0035 (3) Max. 0.0118	(1) 0.0016 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0016 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0315	
Cast Iron	★ 260 - 660	-	-	-	-	(1) 0.0012 - 0.0039 (2) 0.0012 - 0.0031 (3) Max. 0.0079	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0031 (3) Max. 0.0118	(1) 0.0012 - 0.0047 (2) 0.0012 - 0.0035 (3) Max. 0.0118	(1) 0.0016 - 0.0059 (2) 0.0020 - 0.0039 (3) Max. 0.0197	(1) 0.0016 - 0.0047 (2) 0.0020 - 0.0039 (3) Max. 0.0315	

Above cutting conditions are for external grooving. Set both cutting speed and feed rate 20% lower for internal grooving.

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