

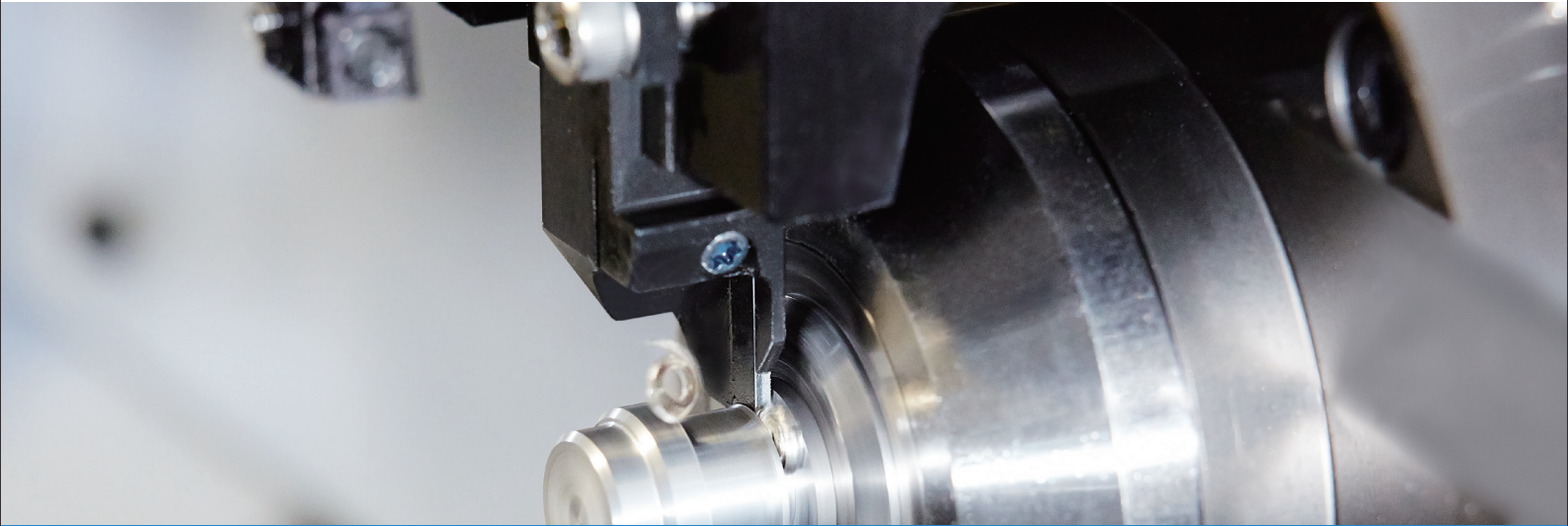
THE NEW VALUE FRONTIER



Cut-off Tool | **KGD**

Cut-off Tool

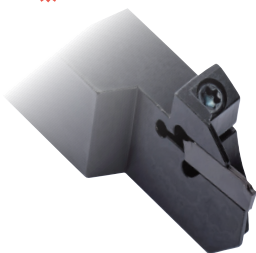
KGD for Automatic Lathe



Stable Machining and Long Tool Life Lower Production Costs

Edge Widths Available from 1.3 mm
Excellent Chip Control
Long Tool Life with "MEGACOAT NANO PR1535"

NEW



New Sub Spindle Toolholder Available

NEW



PF Chipbreaker Corner R 0.15 is Now Available

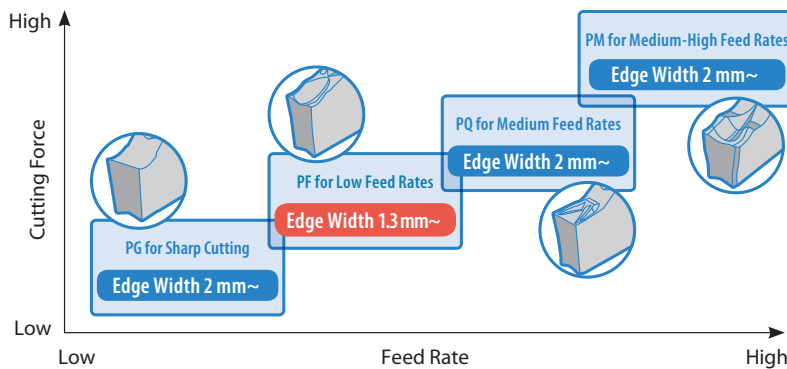


KGD for Automatic Lathe

Edge Widths Available from 1.3 mm

Excellent Chip Control and Stable Machining with Long Tool Life

Point 1 Chipbreaker Lineup and Application



Point 2 Excellent Chip Control with New Molded Chipbreaker



PF Chipbreaker

Depression at center of chipbreaker curls chips at low feed range ($f = 0.01 - 0.05$ mm/rev).

Small corner R (r_c) = 0.03 mm, 0.15 mm effectively reduces the boss remaining on the workpiece surface.



PQ Chipbreaker

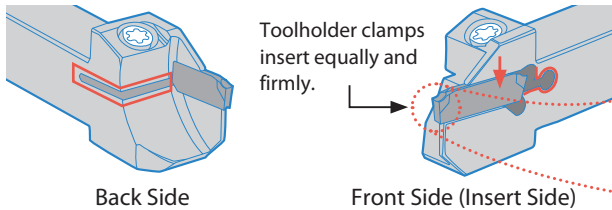
Chipbreaker finely breaks chips with double the projection at medium feed range ($f = 0.04 - 0.1$ mm/rev).

Corner R (r_c) = 0.1 mm combines both sharpness and fracture resistance.

Point 3 Strong Insert Clamping Force

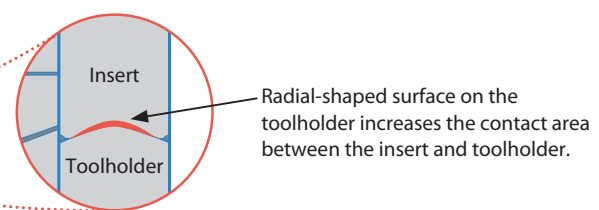
New Slit Design

Insert clamping force is improved by firmly fastening the front side (insert side) of the toolholder.



Radial-shaped Surface on Toolholder

Insert clamping force and installation are improved by increasing contact area between the insert and toolholder.



Clamping Force Comparison (Traversing)

(In-house Evaluation)

Cutting conditions: $V_c = 80$ m/min, $f = \sim 0.3$ mm/rev, $a_p = 1 \sim 3$ mm, wet (oil base)
Workpiece: SK4 ($\phi 10$)

Depth of Cut (a_p)	1 mm		1.5 mm		2 mm		3 mm		
	0.25 mm/rev	0.3 mm/rev	0.25 mm/rev	0.3 mm/rev	0.25 mm/rev	0.3 mm/rev	0.25 mm/rev	0.3 mm/rev	
KGD	Stable Machining							X	Stable Machining
Competitor A			X						
Competitor B			X						

MEGACOAT NANO PR1535

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

Point 1

Toughening with a New Cobalt Mixing Ratio
* Comparison with Kyocera's Conventional Grade

UP
23%
Fracture Toughness*

Point 2

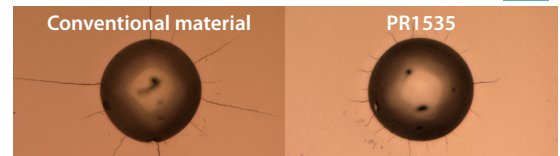
Improved Stability by Optimization and Homogenization of the Particle Matrix

Point 3

Long Tool Life and Stable Machining with MEGACOAT NANO

Cracking Comparison by Diamond Indentor (In-house Evaluation)

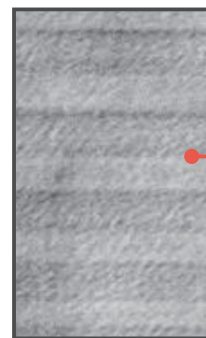
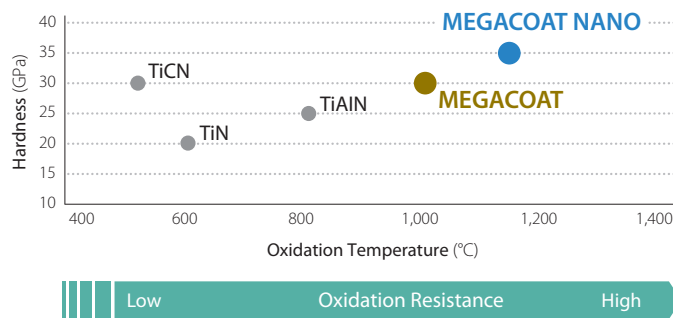
UP
Shock Resistance



Long Cracks

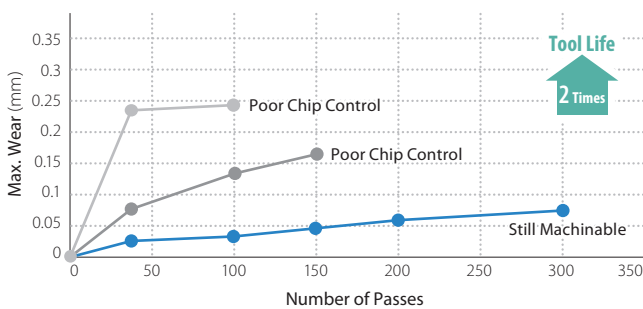
Short Cracks

Coating Property



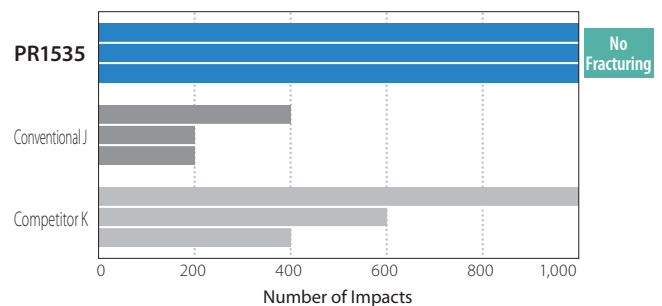
MEGACOAT Base Layer Structure
PR1535 is a good solution for unstable conditions such as early fracturing and variable tool life during steel machining.

Wear Resistance Evaluation (In-house Evaluation)



Cutting Conditions: $n = 1,273 \text{ min}^{-1}$ ($V_c = 80 \text{ m/min}$), $f = 0.025 \text{ mm/rev}$, wet (oil base)
Workpiece: SUS304 ($\phi 20$)

Fracture Resistance Comparison (In-house Evaluation)

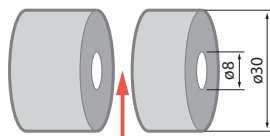


Cutting Conditions: $V_c = 80 \text{ m/min}$, $f = 0.12 \text{ mm/rev}$, wet (water soluble)
Workpiece: SUS304 ($\phi 50$, width: 10 mm 4 slots)

Case Studies

Machine Part SUS304

$V_c = 130 \text{ m/min}$
 $f = 0.04 \text{ mm/rev}$
wet
GDM3020R-025PM-6D PR1535



Number of Workpieces

PR1535 **400 pcs/edge**

UP
2 Times
Tool Life

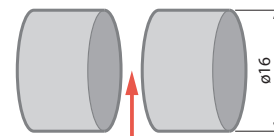
Competitor E **200 pcs/edge**

Compared to Competitor E, PR1535 showed good edge condition and doubled the tool life even at higher feed rates. ($f = 0.03 \text{ mm/rev} \Rightarrow 0.04 \text{ mm/rev}$)

(User Evaluation)

Joint SUS304L

$V_c = 80 \text{ m/min}$
 $f = 0.05 \text{ mm/rev}$
wet
GDM2020N-010PQ PR1535



Number of Workpieces

PR1535 **1,000 pcs/edge**

UP
25%
Tool Life

Competitor F **800 pcs/edge**

PR1535 extended the tool life by 25% compared to Competitor F. PQ chipbreaker showed smooth chip control and cutting edge condition was good without sudden fracturing.

(User Evaluation)



Usage Classification	P	Carbon Steel / Alloy Steel	☐	●	☐	
● : Continuous to Light Interruption / 1st Choice ☐ : Continuous to Light Interruption / 2nd Choice	M	Stainless Steel	●	☐	☐	
● : Continuous / 1st choice ☐ : Continuous / 2nd choice	N	Non-ferrous Metals				●

Shape	Description	Dimensions (mm)						Angle (°)	MEGACOAT NANO		MEGACOAT		Carbide
		Edge Width (W)		Corner R (r _e)	M	L	H		θ	PR1535	PR1225	PR1215	
			Tolerance										
<p>Low Feed Rate 2-edge</p>	GDM 1316N-003PF	1.3	±0.04	0.03	1.0	16	3.7	—	●	●	●		
	1316N-015PF	1.3	±0.04	0.15	1.0	16	3.7	—	●	●	●		
	GDM 1516N-003PF	1.5	±0.04	0.03	1.2	16	3.7	—	●	●	●		
	1516N-015PF	1.5	±0.04	0.15	1.2	16	3.7	—	●	●	●		
	GDM 2020N-003PF	2.0	±0.04	0.03	1.7	20	4.3	—	●	●	●		
	2020N-015PF	2.0	±0.04	0.15	1.7	20	4.3	—	●	●	●		
	GDM 2520N-003PF	2.5	±0.04	0.03	2.1	20	4.3	—	●	●	●		
	2520N-015PF	2.5	±0.04	0.15	2.1	20	4.3	—	●	●	●		
GDM 3020N-003PF	3.0	±0.04	0.03	2.3	20	4.3	—	●	●	●			
3020N-015PF	3.0	±0.04	0.15	2.3	20	4.3	—	●	●	●			
<p>15° Lead Angle Low Feed Rate 2-edge</p>	GDM 1316 ^{R/L} -003PF-15D	1.3	±0.04	0.03	1.0	16	3.7	15°	●	●	●		
	1516 ^{R/L} -003PF-15D	1.5	±0.04	0.03	1.2	16	3.7	15°	●	●	●		
	1516R-015PF-15D	1.5	±0.04	0.15	1.2	16	3.7	15°	R	R	R		
	GDM 2020 ^{R/L} -003PF-15D	2.0	±0.04	0.03	1.7	20	4.3	15°	●	●	●		
	2020R-015PF-15D	2.0	±0.04	0.15	1.7	20	4.3	15°	R	R	R		
	GDM 2520 ^{R/L} -003PF-15D	2.5	±0.04	0.03	2.1	20	4.3	15°	●	●	●		
	2520R-015PF-15D	2.5	±0.04	0.15	2.1	20	4.3	15°	R	R	R		
	GDM 3020 ^{R/L} -003PF-15D	3.0	±0.04	0.03	2.3	20	4.3	15°	●	●	●		
3020R-015PF-15D	3.0	±0.04	0.15	2.3	20	4.3	15°	R	R	R			
<p>Medium Feed Rate 2-edge</p>	GDM 2020N-010PQ	2.0	±0.03	0.1	1.7	20	4.3	—	●	●	●		
	GDM 2520N-010PQ	2.5	±0.03	0.1	2.1	20	4.3	—	●	●	●		
	GDM 3020N-010PQ	3.0	±0.03	0.1	2.3	20	4.3	—	●	●	●		
<p>15° Lead Angle Medium Feed Rate 2-edge</p>	GDM 2020R-010PQ-15D	2.0	±0.03	0.1	1.7	20	4.3	15°	R	R	R		
	GDM 2520R-010PQ-15D	2.5	±0.03	0.1	2.1	20	4.3	15°	R	R	R		
	GDM 3020R-010PQ-15D	3.0	±0.03	0.1	2.3	20	4.3	15°	R	R	R		
<p>Low Cutting Force 2-edge</p>	GDG 2020N-005PG	2.0	±0.02	0.05	1.7	20	4.3	—	●	●		●	
	GDG 2520N-005PG	2.5	±0.02	0.05	2.1	20	4.3	—	●	●		●	
	GDG 3020N-005PG	3.0	±0.02	0.05	2.3	20	4.3	—	●	●		●	
<p>15° Lead Angle Low Cutting Force 2-edge</p>	GDG 2020R-005PG-15D	2.0	±0.02	0.05	1.7	20	4.3	15°	R	R		R	
	GDG 2520R-005PG-15D	2.5	±0.02	0.05	2.1	20	4.3	15°	R	R		R	
	GDG 3020R-005PG-15D	3.0	±0.02	0.05	2.3	20	4.3	15°	R	R		R	

· Corner R (r_e) of PQ chipbreakers are small enough for automatic lathe.
 · PF chipbreaker has a large corner R (r_e).
 ◆ For cutting conditions, see back cover.

Inserts Sold in 10 Piece Boxes
 ● : Std. Item R: Std. Item (Right-hand Only)

Note:
 When grooving, PF/PM chipbreaker (for cut-off) cannot create a flat bottom (see right figure).



Bottom Cutting Shape of PF/PM Chipbreaker

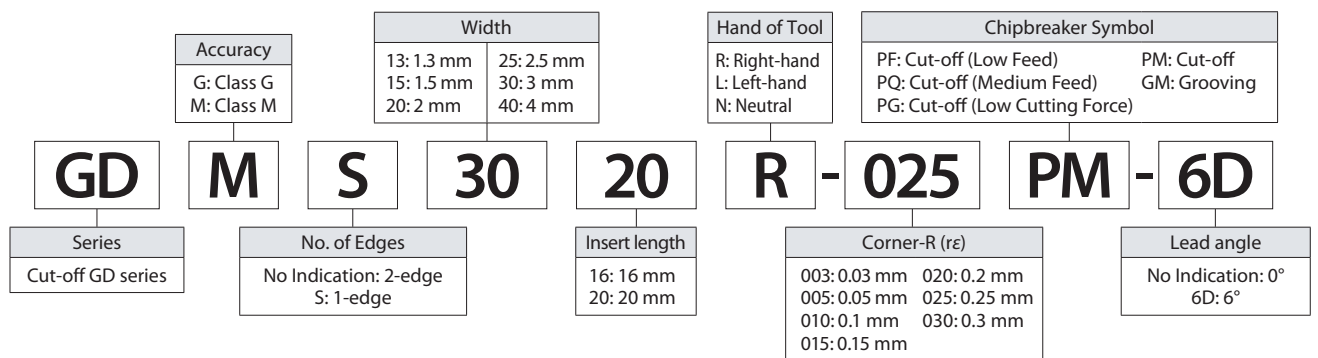
NEW

Shape Right-handed Insert Shown		Description	Dimensions (mm)						Angle (°)	Cermet	MEGACOAT		
			Edge Width (W)		Corner R (r _e)	M	L	H			θ	TN90	PR1535
			Tolerance										
Cut-off	2-edge	GDM 2020N-020PM	2.0	±0.03	0.2	1.5	20	4.3	—		●	●	●
		GDM 2520N-020PM	2.5	±0.03	0.2	1.95	20	4.3	—		●	●	●
		GDM 3020N-025PM	3.0	±0.03	0.25	2.3	20	4.3	—		●	●	●
		GDM 4020N-030PM	4.0	±0.03	0.3	3.3	20	4.3	—		●	●	●
	6° lead angle 2-edge	GDM 2020R-020PM-6D	2.0	±0.03	0.2	1.5	20	4.3	6°		R	R	R
		GDM 2520R-020PM-6D	2.5	±0.03	0.2	1.95	20	4.3	6°		R	R	R
		GDM 3020R-025PM-6D	3.0	±0.03	0.25	2.3	20	4.3	6°		R	R	R
		GDM 4020R-030PM-6D	4.0	±0.03	0.3	3.3	20	4.3	6°		R	R	R
	1-edge	GDMS 2020N-020PM	2.0	±0.03	0.2	1.5	20	4.3	—		●	●	●
		GDMS 3020N-025PM	3.0	±0.03	0.25	2.3	20	4.3	—		●	●	●
		GDMS 4020N-030PM	4.0	±0.03	0.3	3.3	20	4.3	—		●	●	●
		GDMS 2020R-020PM-6D	2.0	±0.03	0.2	1.5	20	4.3	6°		R	R	R
6° lead angle 1-edge	GDMS 3020R-025PM-6D	3.0	±0.03	0.25	2.3	20	4.3	6°		R	R	R	
	GDMS 4020R-030PM-6D	4.0	±0.03	0.3	3.3	20	4.3	6°		R	R	R	
	GDM 2420N-020GM	2.4	±0.03	0.2	1.95	20	4.3	—	●		●	●	
	GDM 3020N-020GM	3.0	±0.03	0.2	2.3	20	4.3	—	●		●	●	
Grooving and cut-off	For general purpose 2-edge	GDM 3020N-040GM	3.0	±0.03	0.4	2.3	20	4.3	—	●		●	●
		GDM 4020N-020GM	4.0	±0.03	0.2	3.3	20	4.3	—	●		●	●
		GDM 4020N-040GM	4.0	±0.03	0.4	3.3	20	4.3	—	●		●	●
		GDM 4020N-080GM	4.0	±0.03	0.8	3.3	20	4.3	—	●		●	●
		GDMS 2220N-020GM	2.2	±0.03	0.2	1.75	20	4.3	—	●		●	●
	For general purpose 1-edge	GDMS 3020N-040GM	3.0	±0.03	0.4	2.3	20	4.3	—	●		●	●
		GDMS 4020N-040GM	4.0	±0.03	0.4	3.3	20	4.3	—	●		●	●

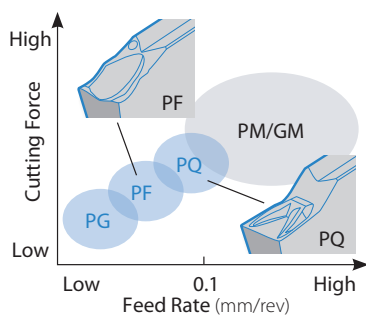
Inserts Sold in 10 Piece Boxes

● : Std. Item R: Std. Item (Right-hand Only)

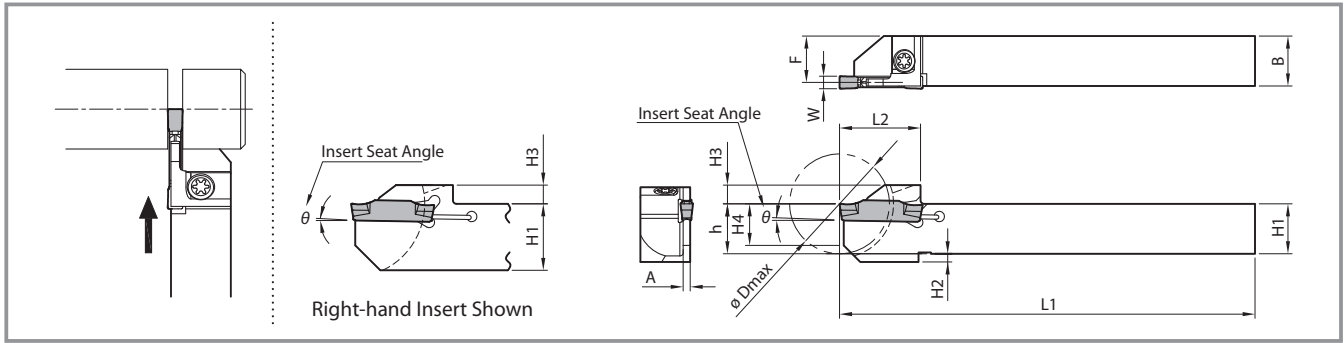
Insert Identification System



Applicable range



KGD (for Automatic Lathe) Edge Width: 1.3~4.0 mm



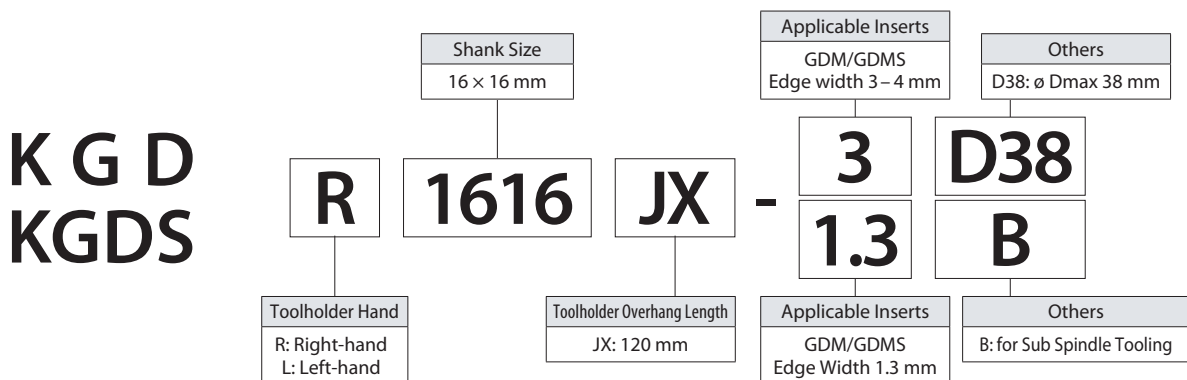
Description	Stock		Cutting Dia. ø Dmax	Dimensions (mm)										Edge Width W (mm)		Spare Parts	
	R	L		H1 = h	H2	H3	H4	B	L1	L2	F	A	θ	MIN.	MAX.	Screw	Wrench
KGD ^{R/L} 1010JX-1.3	●	●	20	10	2	4.5	8	10	120	18	9.5	1.0	5°	1.3	1.3	SB-40120TR	LTW-15S
	●	●	24	12	2	4.5	10	12	120	19.5	11.5	1.0	5°	1.3	1.3	SB-40120TR	LTW-15S
KGD ^{R/L} 1010JX-1.5	●	●	20	10	2	4.5	8	10	120	18	9.4	1.2	5°	1.5	1.5	SB-40120TR	LTW-15S
	●	●	24	12	2	4.5	10	12	120	19.5	11.4	1.2	5°	1.5	1.5	SB-40120TR	LTW-15S
KGD ^{R/L} 1212F-1.3	●	●	24	12	2	4.5	10	12	85	19.5	11.5	1.0	5°	1.3	1.3	SB-40120TR	LTW-15S
KGD ^{R/L} 1212F-1.5	●	●	24	12	2	4.5	10	12	85	19.5	11.4	1.2	5°	1.5	1.5	SB-40120TR	LTW-15S
KGD ^{R/L} 1010JX-2	●	●	20	10	2	4.5	8	10	120	18	9.15	1.7	1°	2.0	3.0	SB-40120TR	LTW-15S
	●	●	24	12	2	4.5	10	12	120	19.5	11.15	1.7	1°	2.0	3.0	SB-40120TR	LTW-15S
	●	●	32	16	—	4.5	10	16	120	24.5	15.15	1.7	1°	2.0	3.0	SB-40120TR	LTW-15S
KGD ^{R/L} 1010JX-2.4	●	●	20	10	2	4.5	8	10	120	18	9	2.0	1°	2.4	3.0	SB-40120TR	LTW-15S
	●	●	24	12	2	4.5	10	12	120	19.5	11	2.0	1°	2.4	3.0	SB-40120TR	LTW-15S
	●	●	32	16	—	4.5	10	16	120	24.5	15	2.0	1°	2.4	3.0	SB-40120TR	LTW-15S
KGD ^{R/L} 1212JX-3	●	●	24	12	2	4.5	10	12	120	19.5	10.8	2.4	1°	3.0	3.0	SB-40120TR	LTW-15S
	●	●	32	16	—	4.5	10	16	120	24.5	14.8	2.4	1°	3.0	4.0	SB-40120TR	LTW-15S
KGD ^{R/L} 1212F-2	●	●	24	12	2	4.5	10	12	85	19.5	11.15	1.7	1°	2.0	3.0	SB-40120TR	LTW-15S
KGD ^{R/L} 1212F-2.4	●	●	24	12	2	4.5	10	12	85	19.5	11	2.0	1°	2.4	3.0	SB-40120TR	LTW-15S
KGD ^{R/L} 1616JX-3D38	●	●	38	16	—	6	10	16	120	29	14.8	2.4	1°	3.0	4.0	SE-50125TR	LTW-20
KGD ^{R/L} 2012JX-3D42	●	●	42	20	—	6	14	12	120	31	10.8	2.4	1°	3.0	4.0	SE-50125TR	LTW-20
	●	●	42	20	—	6	14	20	120	31	18.8	2.4	1°	3.0	4.0	SE-50125TR	LTW-20

Although 4.0 mm-width insert can be installed in KGD^{R/L}1212JX-3, it is not recommended due to the toolholder's rigidity. ● : Std. Item

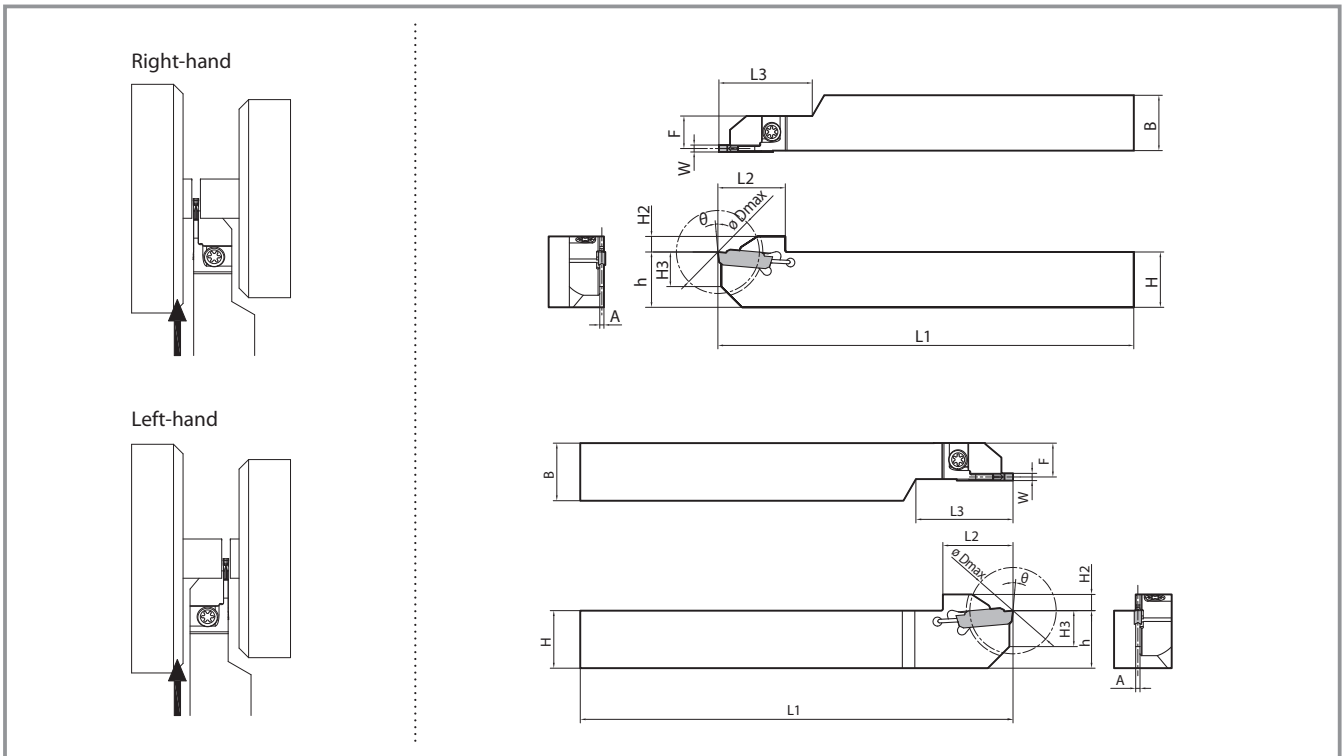
Note : When machining large cutting dia. (over 36 mm) with KGD^{R/L}...-3D38 or KGD^{R/L}...-3D42, please follow the instructions below

- Use 1-edge inserts.
- Maximum workpiece diameter for 2-edge inserts is ø 36 mm.

Toolholder Identification System



KGDS (for Cut-Off Operation Near Sub Spindle Side)



Description	Stock		Cutting Dia.	Dimensions (mm)										Edge Width W (mm)		Spare Parts	
	R	L		ø Dmax	H = h	H2	H3	B	L1	L2	L3	F	A	θ (°)	MIN.	MAX.	Screw
KGDS ^{R/L} 1616JX-1.3B	●	●	24	16	4.5	10	16	120	19.5	27	9.50	1.0	5.0	1.3	1.3	SB-40120TR	LTW-15S
KGDS ^{R/L} 1616JX-1.5B	●	●	24	16	4.5	10	16	120	19.5	27	9.40	1.2	5.0	1.5	1.5	SB-40120TR	LTW-15S
KGDS ^{R/L} 1616JX-2B	●	●	24	16	4.5	10	16	120	19.5	27	9.15	1.7	1.0	2.0	3.0	SB-40120TR	LTW-15S

● : Std. Item

KG D / KGDS Selection Reference

KG D Standard Type

Both Right-hand and Left-hand types are applicable to gang tool post. Left-hand type is recommended for cut-off operations when using a sub-spindle.

KGDR (Right-hand)	KGDL (Left-hand)
Recommendations (Right-hand) <ul style="list-style-type: none"> · Use insert with lead angle to remove boss · No sub-spindle · Cut-off close to main spindle 	Recommendations (Left-hand) <ul style="list-style-type: none"> · Insert without lead angle · Sub-spindle use · Cut-off close to sub-spindle

KGDS Sub Spindle Type

The KGDS can be used to reduce overhang distance from the main spindle when cutting off small diameter workpieces.

KGDSR (Right-hand)	KGDSL (Left-hand)
Recommendations (Right-hand) <ul style="list-style-type: none"> · Long workpiece · Good rigidity · Cut-off near main spindle 	Recommendations (Left-hand) <ul style="list-style-type: none"> · Short workpiece · Poor rigidity · Cut-off near sub-spindle

Machining Tips

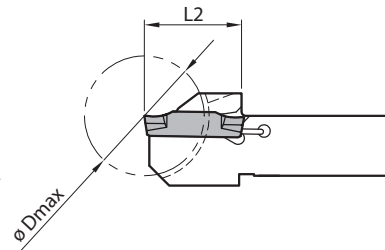
Minimum Overhand Length (L2) of the Toolholder

Advantage 1 Compatible with any machine setups regardless of overhang length specifications

Advantage 2 Minimum and optimal overhang length helps to control chattering

Product Lineup with a Maximum Cutting Diameter of 42 mm

Note :
 When machining large cutting dia. (over 36 mm) with KGD[®]/L...-3D38 or KGD[®]/L...-3D42, please follow the instructions below
 · Use 1-edge inserts
 · Maximum workpiece diameter for 2-edge inserts is ϕ 36 mm



Recommended Cutting Conditions of PF / PQ / PG Chipbreaker ★ 1st Recommendation ☆ 2nd Recommendation

Workpiece	Cutting Conditions (Vc: m/min)				Feed Rate (f: mm/rev)										Notes
	Recommended Insert Grade				PF (Corner R0.03)			PF (Corner R0.15)			PQ		PG		
	MEGACOAT NANO	MEGACOAT		Carbide	Edge Width W (mm)			Edge Width W (mm)			Edge Width W (mm)		Edge Width W (mm)		
	PR1535	PR1225	PR1215	GW15	1.3/1.5	2.0	2.5/3.0	1.3/1.5	2.0	2.5/3.0	2.0	2.5/3.0	2.0	2.5/3.0	
Carbon Steel	☆ 70-150	★ 70-150	☆ 70-180	—	0.01 -0.04	0.02 -0.06	0.02 -0.08	0.01 -0.05	0.03 -0.08	0.04 -0.10	0.03 -0.1	0.04 -0.12	0.01 -0.04	0.01 -0.05	Wet
Alloy Steel	☆ 70-150	★ 70-150	☆ 70-180	—	0.01 -0.03	0.01 -0.04	0.01 -0.05	0.01 -0.04	0.03 -0.07	0.04 -0.08	0.02 -0.07	0.02 -0.08	0.01 -0.03	0.01 -0.04	
Stainless Steel	★ 60-120	☆ 60-120	☆ 60-150	—	0.01 -0.05	0.02 -0.07	0.03 -0.08	0.01 -0.06	0.03 -0.09	0.04 -0.10	0.04 -0.1	0.04 -0.12	0.01 -0.04	0.01 -0.05	
Cast Iron	—	—	★ 80-200	☆ 50-100	—	—	—	—	—	—	—	—	0.01 -0.05	0.01 -0.06	
Aluminum	—	—	—	★ 200-450	—	—	—	—	—	—	—	—	0.01 -0.07	0.01 -0.08	
Brass	—	—	—	★ 100-200	—	—	—	—	—	—	—	—	0.01 -0.07	0.01 -0.08	

Recommended Cutting Conditions of PM / GM Chipbreaker ★ 1st Recommendation ☆ 2nd Recommendation

Workpiece	Cutting Conditions (Vc: m/min)			Feed Rate (f: mm/rev)			Notes
	Recommended Insert Grade			PM	GM		
	MEGACOAT NANO	MEGACOAT		Edge Width W (mm)	Edge Width W (mm)		
	PR1535	PR1225	PR1215	2.0-4.0	2.2/2.4	3.0/4.0	
Carbon Steel	☆ 80-200	★ 80-200	☆ 100-200	0.08-0.18	0.05-0.18	0.08-0.2	Wet
Alloy Steel	☆ 70-180	★ 70-180	☆ 80-180				
Stainless Steel	★ 60-150	☆ 60-150	☆ 60-150	0.06-0.12	0.05-0.12	0.08-0.15	
Cast Iron	—	—	★ 100-200	0.08-0.18	0.05-0.20	0.08-0.22	