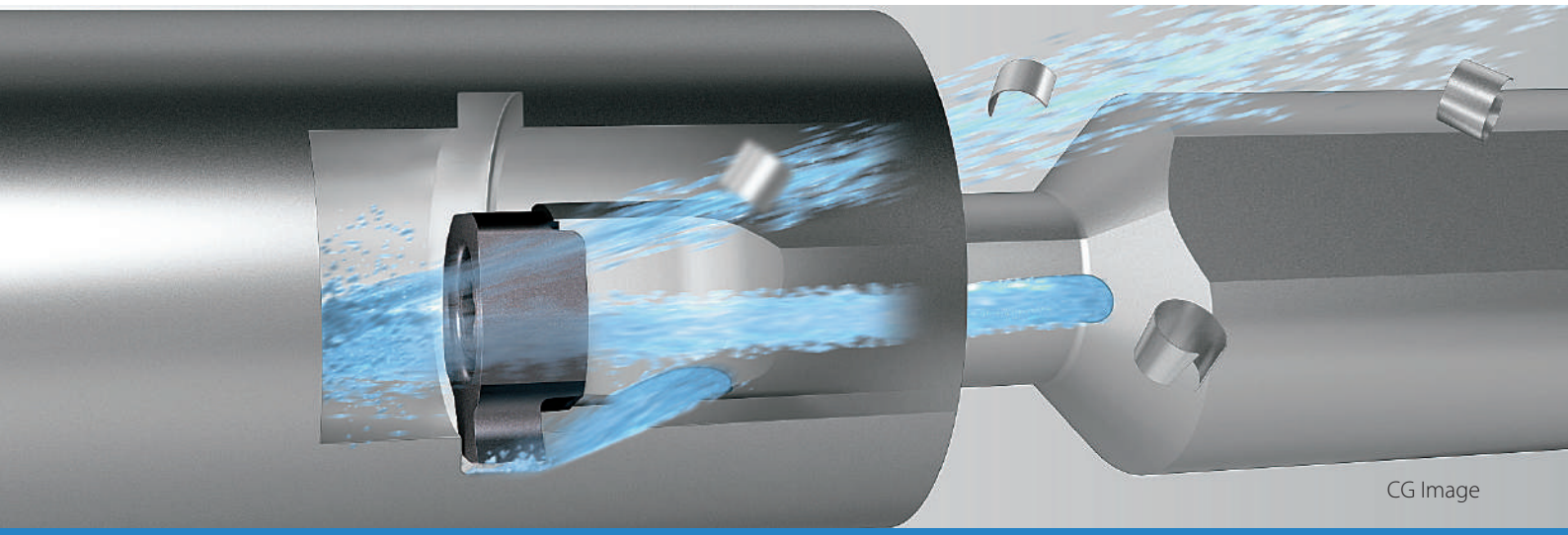
THE NEW VALUE FRONTIER

KYOCERA

High-Precision
Small Internal Grooving | SIGC

High-Precision Small Internal Grooving

SIGC NEW



CG Image

High-Precision Small Internal Grooving with a ø8 mm Minimum Cutting Diameter

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

Excellent Chip Evacuation with Double Coolant Holes

Long Tool Life with MEGACOAT NANO PLUS "PR1725"

Minimum Cutting Diameter ø8 mm

Excellent Bars and Carbide Shank Bars Added to the Lineup

High-Precision Small Internal Grooving

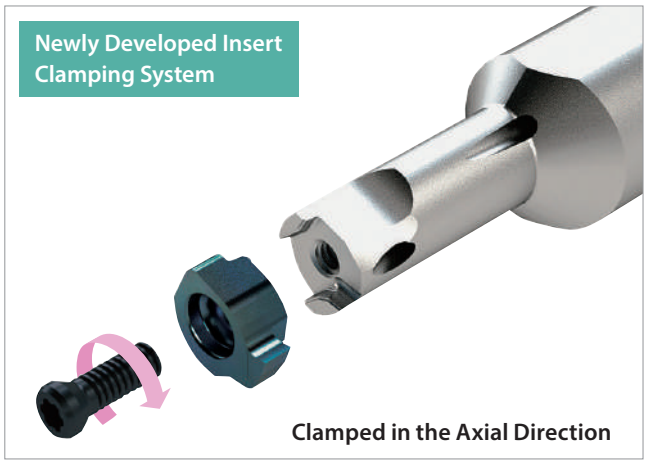
SIGC

Newly Developed Clamping System Ensures a Firm Insert Hold to Provide High-Precision Machining. Excellent Chip Evacuation with Double Coolant Holes and Optimized Flute Shape with a ø8mm Minimum Cutting Diameter

1 Firm Insert Clamping System Provides High-Precision Machining

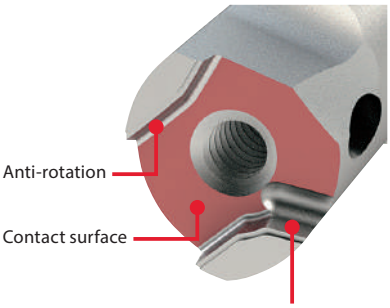
Firm clamping action by pulling the bottom surface of the insert in axial direction

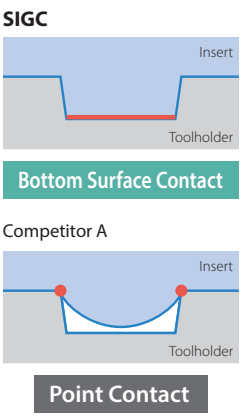
Stable machining is achieved by ensuring a firm clamp on the insert



Clamping Part (image)

Firm clamping is available due to large contact surface

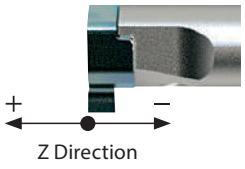


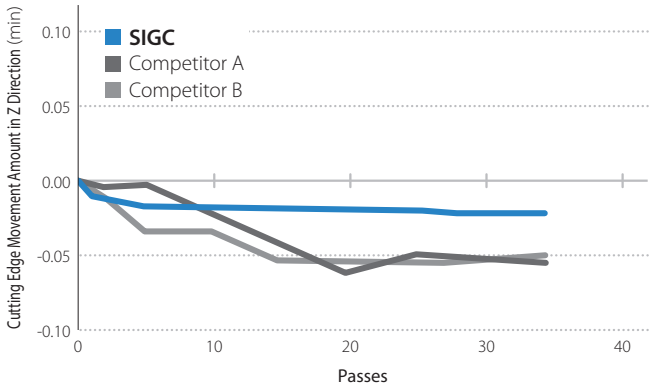


Cutting Edge Stability Position Comparison (Internal evaluation)

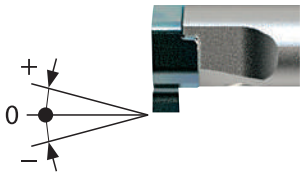
Measurement of the cutting edge position and angle after turning

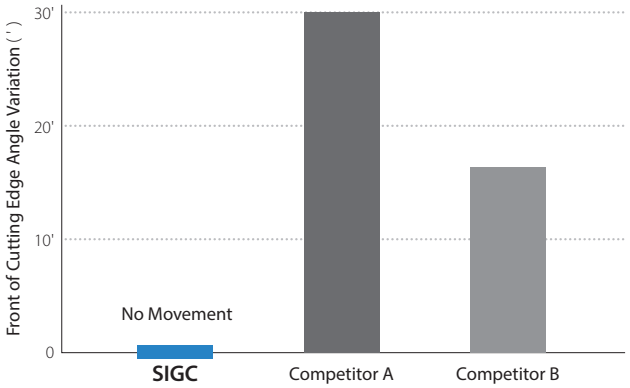
Cutting Edge Movement Amount in Z Direction (mm)





Front of Cutting Edge Angle Variation (')





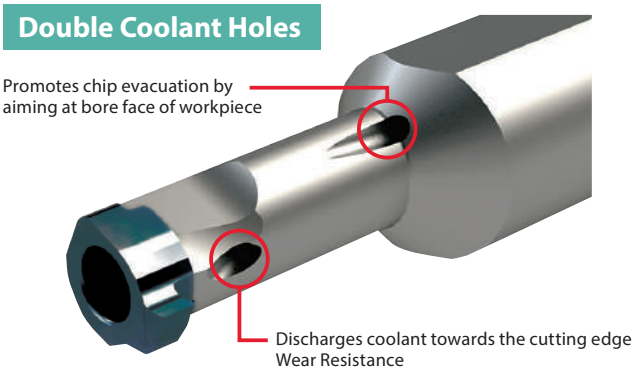
Cutting Conditions : Vc = 50 m/min, ap = 0.2 mm, f = 0.05 mm/rev, Wet Workpiece : SCM435 External Turning

SIGC ensures high precision machining by preventing cutting edge position movement

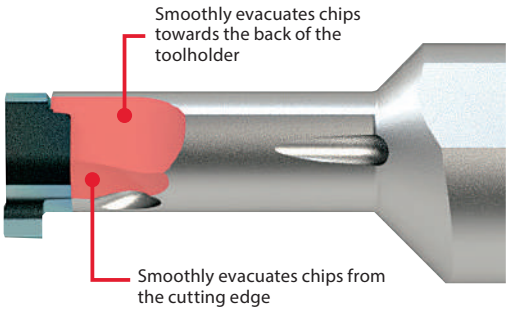
2 Excellent Chip Evacuation

Excellent Chip Evacuation with Double Coolant Holes and Optimized Flute Shape

Double Coolant Holes



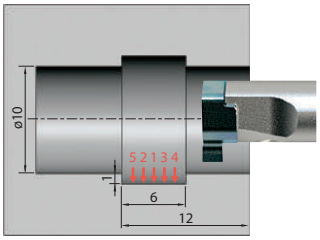
Flute Shape



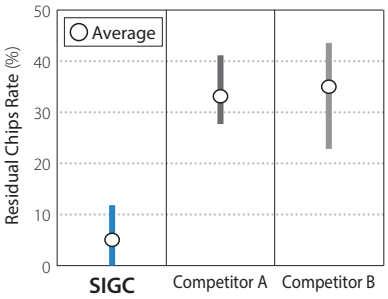
Provides a better solution when facing chip evacuation difficulties in small internal grooving
Prevents chip crunching

Chip Evacuation Comparison
(Internal evaluation)

Cutting Conditions : Vc = 50 m/min,
ap = 1.0 mm (Shouldering), f = 0.03 mm/rev,
Wet (Internal Coolant), Workpiece : SCM415,
With Edge Width 2 mm



Residual Chips Rate (%)



$$\text{Residual Chips Rate (\%)} = \frac{\text{Weight of remaining chip in the hole (g)}}{\text{Weight of chips removed (g)}} \times 100$$

Chip Evacuation Comparison

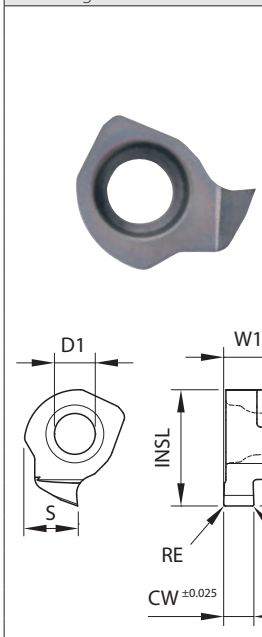
Good Chip Evacuation

3 Large Lineup for Various Internal Grooving

Minimum Cutting Diameter ø8 mm

Excellent Bars and Carbide Shank Bars Added to the Lineup

Applicable Inserts

Inserts Right-hand Insert Shown	Description		Dimension (mm)							MEGACOAT NANO PLUS		MEGACOAT NANO		Applicable Toolholders
			CW	CDX	RE	W1	INSL	S	D1	PR1725		PR1535		
										R	L	R	L	
	GC08 R/L	100-005	1.00	1.5	0.05	3.4	7.7	3.5	2.7	●	●	●	●	SIGC R/L0812-EH SIGC R/L0806-WH
		120-005	1.20							●	●	●	●	
		125-005	1.25							●	●	●	●	
		150-010	1.50		0.1					●	●	●	●	
		200-010	2.00							●	●	●	●	
	GC10 R/L	100-005	1.00	2.2	0.05	4.7	9.6	4.4	3.5	●	●	●	●	SIGC R/L1016-EH SIGC R/L1008-WH-L85 SIGCR1008-WH-L100
		120-005	1.20							●	●	●	●	
		125-005	1.25							●	●	●	●	
		145-010	1.45		0.1					●	●	●	●	
		150-010	1.50							●	●	●	●	
		200-010	2.00							●	●	●	●	
		250-020	2.50		0.2					●	●	●	●	
		300-020	3.00							●	●	●	●	
	GC12 R/L	100-005	1.00	2.2	0.05	4.7	11.6	5.4	3.5	●	●	●	●	SIGC R/L1216-EH SIGCR1210-WH-L95 SIGC R/L1210-WH-L110
		120-005	1.20							●	●	●	●	
		125-005	1.25							●	●	●	●	
		145-010	1.45		0.1					●	●	●	●	
		150-010	1.50							●	●	●	●	
		200-010	2.00							●	●	●	●	
		250-020	2.50		0.2					●	●	●	●	
		300-020	3.00							●	●	●	●	

• CDX : shows available grooving depth
• Inserts are sold in 5 piece boxes

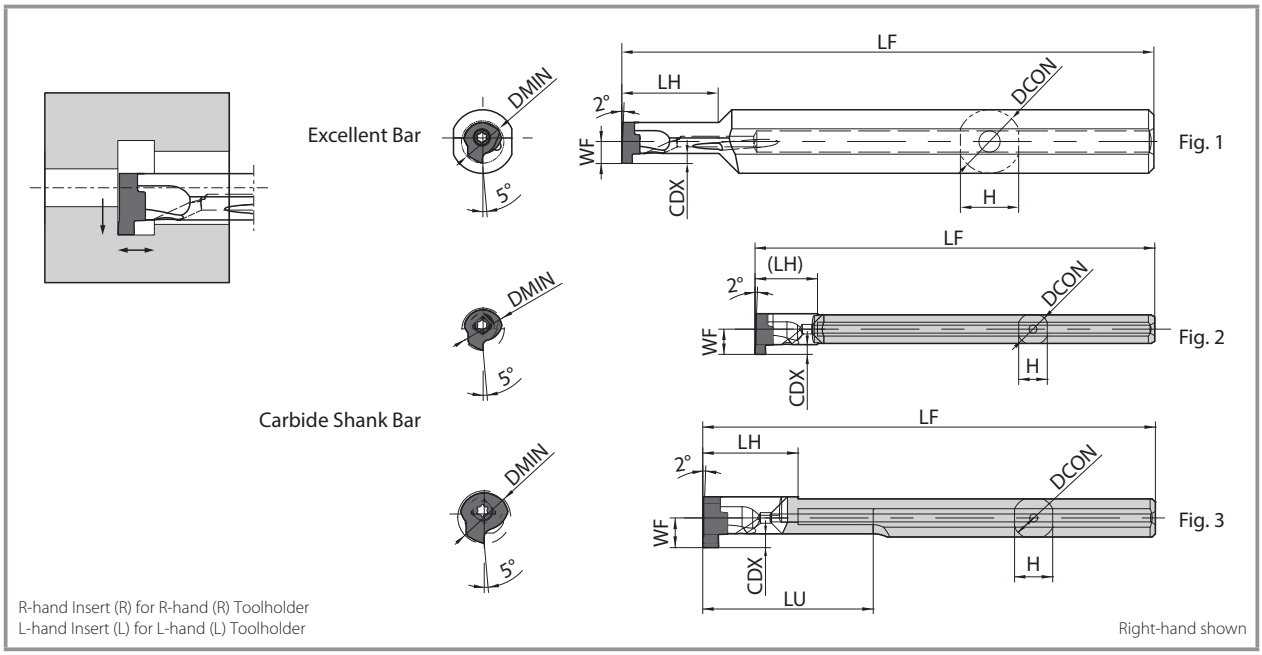
● : Standard Stock

Recommended Cutting Conditions

Workpiece	Recommended Insert Grade (Cutting Conditions Vc : m/min)		(1) f for Grooving (mm/rev) (2) f for Turning (mm/rev) (3) ap for Turning (mm)			Notes
	MEGACOAT NANO PLUS	MEGACOAT NANO				
	PR1725	PR1535	GC08 R/L…	GC10 R/L, GC12 R/L 100 ~ 200…	GC10 R/L, GC12 R/L 250 ~ 300…	
Carbon Steel (SxxC etc.)	★ 50 ~ 80	☆ 50 ~ 80	(1) 0.01 ~ 0.03	(1) 0.02 ~ 0.04	(1) 0.02 ~ 0.04	Wet
			(2) 0.01 ~ 0.03	(2) 0.02 ~ 0.04	(2) 0.02 ~ 0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Alloy Steel (SCM etc.)	★ 50 ~ 80	☆ 50 ~ 80	(1) 0.01 ~ 0.03	(1) 0.02 ~ 0.04	(1) 0.02 ~ 0.04	
			(2) 0.01 ~ 0.03	(2) 0.02 ~ 0.04	(2) 0.02 ~ 0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Stainless Steel (SUS304 etc.)	☆ 50 ~ 80	★ 50 ~ 80	(1) 0.01 ~ 0.03	(1) 0.01 ~ 0.03	(1) 0.01 ~ 0.03	
			(2) 0.01 ~ 0.03	(2) 0.01 ~ 0.03	(2) 0.01 ~ 0.03	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	

★ : 1st Recommendation ☆ : 2nd Recommendation

SIGC



Toolholder Dimensions

Description		Stock		Min. Cutting Dia.	Dimension (mm)							Spare Parts		Applicable Insert
												Clamp Screw	Wrench	
		R	L	DMIN	DCON	H	LF	LH	WF	CDX	Shape			
SIGC R/L	0812-EH	●	●	8	12	11	100	18	4.1	1.5	Fig. 1	SB-2270T R/L	FT-7	GC08 R/L100-005 ~ GC08 R/L200-010
	1016-EH	●	●	10	16	15	100	21	5.0	2.2		SB-3070T R/L	FT-8	GC10 R/L100-005 ~ GC10 R/L300-020
	1216-EH	●	●	12	16	15	110	25	6.0	2.2				GC12 R/L100-005 ~ GC12 R/L300-020
SIGC R/L	0806-WH	●	●	8	6	5.4	75	–	4.8	1.5	Fig. 2	SB-2270T R/L	FT-7	GC08 R/L100-005 ~ GC08 R/L200-010
	1008-WH-L85	●	●	10	8	7.2	85	32	5.6	2.2	Fig. 3	SB-3070T R/L	FT-8	GC10 R/L100-005 ~ GC10 R/L300-020
	1008-WH-L100	●					100	45						GC10R100-005 ~ GC10R300-020
	1210-WH-L95	●		12	10	9.2	95	32	6.6					GC12R100-005 ~ GC12R300-020
	1210-WH-L110	●	●				110	45						GC12 R/L100-005 ~ GC12 R/L300-020

Mounting Inserts

Use compressed air or other measures to remove chips from the insert pocket

Mount the insert into the toolholder ensure the bottom makes contact with the end of the toolholder's surface

Keeping the insert seated, tighten the insert clamp screw at an appropriate torque

Recommended tightening torque for clamp screw : 0.8 N · m(SB-2270TR) 1.2 N · m(SB-3070TR)

L-hand clamp screw for L-hand toolholder (Fig.1)

● : Standard Stock

Fig.1

GC**R-***	GC**L-***
LOCK **Right-hand** screw	LOCK **Left-hand** screw
Tool holder : SIGC**R******-**	Tool holder : SIGC**L******-**
Insert : GC**R-***	Insert : GC**L-***
Clamp Screw : SB-******TR**	Clamp Screw : SB-******TL**

Applicable Sleeve

Applicable Sleeves. Please see the KYOCERA general product catalog for more details.

Shank Size (Diameter : mm)	06 (6 mm)	08 (8 mm)	10 (10 mm)	12 (12 mm)	16 (16 mm)
Toolholders	SIGC R/L 0806-WH	SIGC R/L 1008-WH-L85 SIGC R/L 1008-WH-L100	SIGC R/L 1210-WH-L95 SIGC R/L 1210-WH-L110	SIGC R/L 0812-EH	SIGC R/L 1016-EH SIGC R/L 1216-EH
SH Sleeve (for Boring Bars)	SH 06…	SH 08…	SH 10…	SH 12…	SH 16…
SHC Sleeve (for Coolant Sleeves)	–	SHC 08…	SHC 10…	SHC 12…	SHC 16…
SHA Sleeve	–	SHA 08…	SHA 10…	SHA 12…	–
EZH Sleeve (for EZ Bars)	EZH 06…ST/CT/HP…	EZH 08…ST/CT/HP…	–	–	–

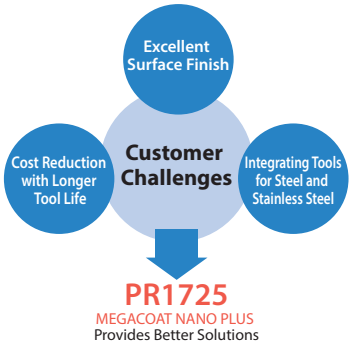
Remove the positioning pin when mounting SIGC to the EZH-CT/HP Sleeve.
(Positioning function is not available.)

PVD Coating for Small Parts Machining

PR1725

MEGACOAT NANO PLUS Maintains Long Tool Life and Excellent Surface Finish. Great Performance in Small Parts Machining Applications

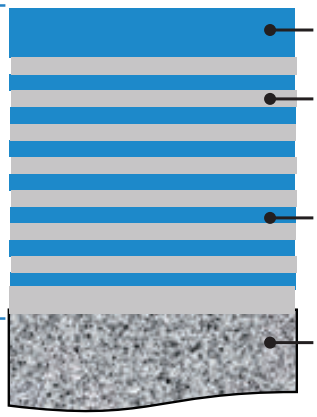
Long tool life leads to improved cycle time
Excellent surface finish with no tearing lowers quality control costs



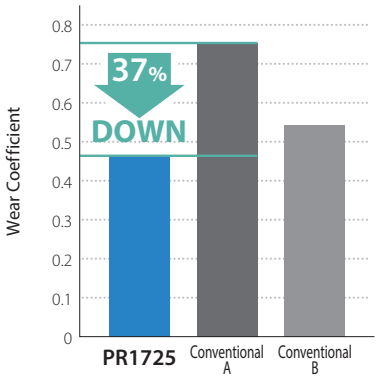
MEGACOAT NANO PLUS

AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance
Excellent Surface Finish and Long Tool Life

<Reduces cracking>
Reduces abnormal damages such as chipping because of increased lamination layer with a thinner gap than conventional coatings.



Wear Coefficient Comparison
(Internal evaluation)



Superior Wear and Chipping Resistance

High hardness 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

Excellent oxidation resistance. Superior high temperature properties maintains good performance in steel, stainless steel and free-cutting steel

High Machining Stability

Tough micro-grain carbide substrate provides stable machining

CP440-2