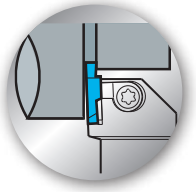


THE NEW VALUE FRONTIER



Internal Grooving

SIGE

Internal screw clamp toolholder provides excellent chip evacuation

Tool Holder / Sleeve for automatic lathes

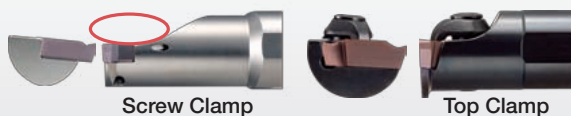
8mm minimum cutting diameter with a 2 edge design

ADVANCING PRODUCTIVITY

Advantages

- The traditional top clamp has been replaced with a screw clamp only. This design creates a large chip pocket that provides excellent chip evacuation.

Large chip pocket



- Cost effective chip control from a 3-D molded chipbreaker (GER---M)



NEW

SIGE tool holder and sleeve for automatic lathes

SIGE tool holder

The locating surface for the sleeve lock screw reaches nearly to the insert pocket. This provides a maximum range of overhang adjustment to reduce chatter.

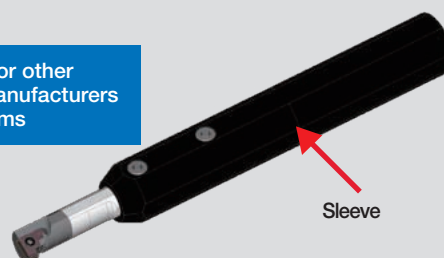
Can be restrained by the sleeve



Applicable Sleeve

Provides adjustment to toolholder overhang to reduce vibration and chatter.

Shank diameters for other automatic lathe manufacturers added to stock items



- Cutting edge is protected in the pocket.



- An 8mm minimum cutting diameter with a 2 edge design

- New PR1025 PVD coated carbide

Consistent machining with our new micrograin carbide structure and PVD-FS TiCN coating



Comparison of chip evacuation (3-D molded chipbreaker)

Description	Feed rate (mm/rev)	SCM415 (Minimum Bore Dia.)			Evaluation
		0.05	0.07	0.1	
SIGER1612C-EH GER300-020CM (PR1025)					Good chip control
Comp A (Width 3mm)				Insert fracture	Unstable chip control and biting
Comp B (Width 3mm)					Unstable chip control and biting

(Vc=100m/min, ap=2.0mm, Wet)

Internal evaluation

Comparison of chip evacuation (Minimum cutting dia. 8mm)

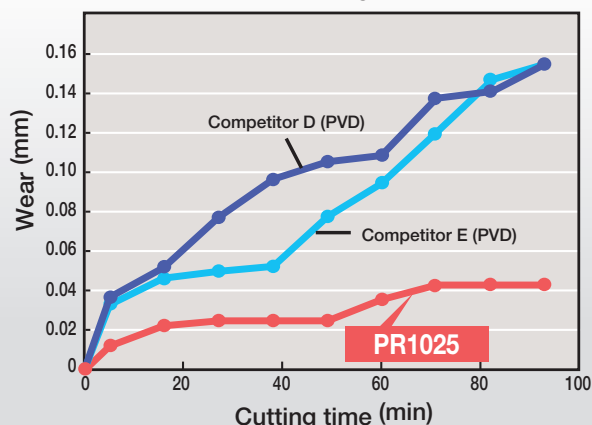
Description	Feed rate (mm/rev)	SCM415	Evaluation
		0.02	
SIGER0808A-EH GER200-010A (PR1025)			
Comp C (Width 2mm)			

(Vc=50m/min, ap=1.25mm, Wet)

Internal evaluation

Comparison of wear resistance

- Maximum wear amount of front edge relief surface



(Vc=100m/min, ap=1mm, f=0.05mm/rev, One side grooving Wet, SCM435)
Internal evaluation

Case Studies

SUM	
- Sleeve - Vc=60m/min - ap=1.5mm - f=0.02~0.04mm/rev - Wet - SIGER1412C-EH GER200-010CM (PR1025)	
PR1025	1,500pcs/edge
Competitor Coated A	250pcs/edge
Competitor A exhibited chatter and damage to the insert clamp. The SIGE holder with grade PR1025 eliminated the chatter and tool life per edge was increased to 6 times that of Competitor A's coated grade. PR1025 is also available with 2 cutting edges, while Competitor A has only 1. The tool life per insert with PR1025 was 12 times Competitor A!	
Evaluation by the user	

SIGE Insert and Toolholder Lineup

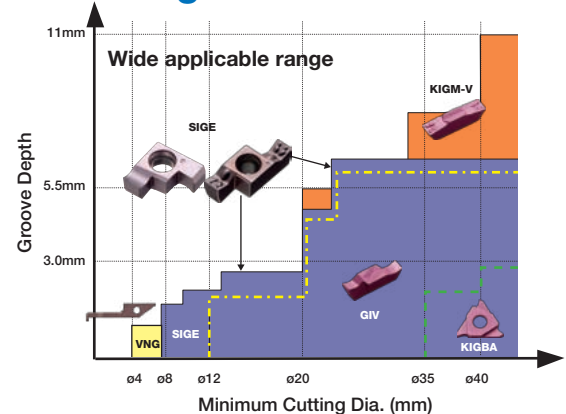
In- sert	Shape								
	Description	GE ^R /...A GER...AR	GE ^R /...B GER...BR	GER...CM -	GER...DM -	GER...EM -	GE ^R /...C GER...CR	GE ^R /...D GER...DR	GE ^R /...E -
	Groove Width(mm)	1.0 2.0	1.0 3.0	1.5 3.5	1.5 2.5 3.0 4.0	1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0	1.0 3.5	1.0 1.45 1.5 1.95 2.0 2.8 3.0 4.0	1.5 1.95 2.0 2.3 2.5 3.0 3.3 3.5 4.0 4.3 4.5 5.0
	Available Groove Depth (mm)	7 6 5 4 3 2 1							
Tool- holder	Minimum Cutting Dia. (mm)	ø8	ø10,ø12	ø14,ø16	ø20	ø25,ø32,ø40	ø14,ø16	ø20	ø25,ø32,ø40
	Excellent Bar	SIGE ^R /...A-EH	SIGE ^R /...B-EH	SIGE ^R /...C-EH	SIGE ^R /...D-EH	SIGE ^R /...E-EH	SIGE ^R /...C-EH	SIGE ^R /...D-EH	SIGE ^R /...E-EH
	Carbide Shank Bar	SIGE ^R /...A-WH	SIGE ^R /...B-WH(-90)	SIGE ^R /...C-WH(-90)	-	-	SIGE ^R /...C-WH(-90)	-	-

Available Groove Depth of Internal Grooving Tool

Groove width (mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.0	1.0	1.45	2.8	0.33	1.5	3.0	4.0	4.0
	2.0	2.0	2.0	2.0	2.0	3.0	3.5	4.0	5.0	3.0	3.4	4.0	5.0	2.5	4.8	4.0	5.0	5.0
Available Groove Depth (mm)	11																	11.0
	10																	8.5
	9																	
	8																	
	7																	
	6																	
	5																	
	4																	
	3																	
	2																	
	1																	
Minimum Cutting Dia. (mm)	ø4	ø5	ø6	ø7	ø8	ø10	ø12	ø14	ø16	ø20	ø25	ø32	ø40	ø12	ø14	ø16	ø20	ø25
Toolholder	VNG		SIGE		GIV		KIGBA		KIGM-V									

Available groove depth depends on the maximum groove width of the attached insert. Please refer to the toolholder catalogs for details.

Applicable Range of Internal Grooving Tool



Applicable Insert & Rake Angle(α) after Installment of Insert

Description	Applicable Insert & Rake Angle (α) after Installment of Insert			
	Ground Chipbreaker	$\alpha(^{\circ})$	3-D Molded Chipbreaker	$\alpha(^{\circ})$
SIGE ^R / 0808A-EH	GE ^R /100-005A~GE ^R /200-010A GER100-050AR~GER200-100AR	5°	-	-
	1010B-EH	5°	-	-
	1210B-EH			
	1412C-EH	8°	GER150-010CM~GER350-020CM	10°
	1612C-EH			
	1616C-EH			
	2020D-EH	9°	GER150-010DM~GER400-020DM	10°
SIGE ^R / 0808A-WH	2525E-EH	10°	GER150-010EM~GER500-020EM	10°
	3232E-EH			
	4032E-EH			
SIGE ^R / 0808A-WH	GE ^R /100-005A~GE ^R /200-010A GER100-050AR~GER200-100AR	5°	-	-
	1010B-WH	5°	-	-
	1210B-WH			
	1412C-WH	8°	GER150-010CM~GER350-020CM	10°

For automatic lathe

SIGER	1008B-WH-90	GER100-005B~GER300-020B GER100-050BR~GER200-100BR	5°	-	-
	1210B-WH-90				
	1412C-WH-90	GER100-005C~GER350-020C GER200-100CR~GER300-150CR	8°	GER150-010CM~GER350-020CM	10°

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

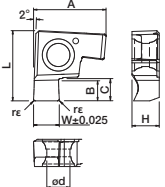
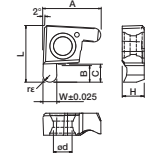
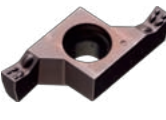
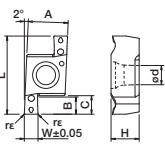
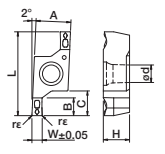
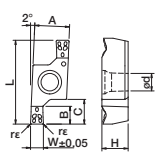
■ Applicable Insert

Description	A	L	H	ød
GE%...-A	6.69	6.5	2.58	2.5
GER...-AR				
GE%...-B	8.46	8.2	3.18	2.7
GER...-BR				
GER...-CM	5.8	11.48	4.05	2.8
GER...-DM	6.8	16.44	5.05	3.4
GER...-EM	9.54	21.66	5.55	4.4

(mm)

P	Carbon Steel / Alloy Steel		●		
M	Stainless Steel		●		
K	Cast Iron				○
N	Non-ferrous Material				●
S	Titanium alloy				●
H	Hardened Material (~40HRC)		●		
	Hardened Material (40HRC~)				

Indication of clasification
 ●:Light Interruption / 1st choice
 ○:Light Interruption / 2nd choice
 ●:Continuous / 1st choice
 ○:Continuous / 2nd choice

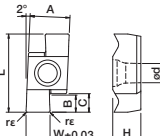
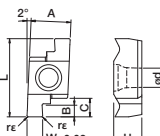
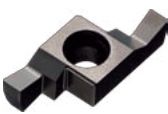
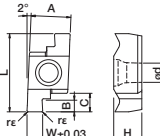
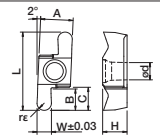
Shape		Description	Dimension (mm)				Cermet	PVD coated		Carbide		Applicable Toolholder			
			W	B	C	rε	TN6020	PR1025	GW15	KW10					
							R	L	R	L	R		L	R	L
Right-handed insert shown															
 2 Edge type		GE%L	100-005A	1.00	1.5	1.8	0.05	●	●	●	●		●	●	SIGE%L...A-EH SIGE%L...A-WH
			120-005A	1.20				●	●	●	●		●	●	
			125-005A	1.25				●	●	●	●		●	●	
			150-010A	1.50				●	●	●	●		●	●	
			200-010A	2.00				●	●	●	●		●	●	
		GE%L	100-005B	1.00	2.2	2.6	0.05	●	●	●	●		●	●	SIGE%L...B-EH SIGE%L...B-WH SIGER...B-WH-90
			120-005B	1.20				●	●	●	●		●	●	
			125-005B	1.25				●	●	●	●		●	●	
			145-010B	1.45			0.1	●	●	●	●		●	●	
			150-010B	1.50				●	●	●	●		●	●	
			200-010B	2.00				●	●	●	●		●	●	
			250-020B	2.50			0.2	●	●	●	●		●	●	
			300-020B	3.00				●	●	●	●		●	●	
			 Full-R				GER	100-050AR	1.00	1.5	1.8	0.5		●	
200-100AR	2.00	1.0				●						●			
GER	100-050BR	1.00			2.2	2.6	0.5		●			●		SIGER...B-EH SIGER...B-WH SIGER...B-WH-90	
	200-100BR	2.00					1.0		●			●			
 2 Edge type 3-D molded Chipbreaker		GER	150-010CM	1.50	2.5	2.7	0.1		●					SIGER...C-EH SIGER...C-WH SIGER...C-WH-90	
			200-010CM	2.00					●						
			250-020CM	2.50			0.2		●						
			300-020CM	3.00					●						
			350-020CM	3.50				●							
		GER	150-010DM	1.50	3.0	4.8	0.1		●					SIGER...D-EH	
			200-010DM	2.00					●						
			230-020DM	2.30					●						
			250-020DM	2.50	0.2		●								
			300-020DM	3.00			●								
			350-020DM	3.50			●								
			400-020DM	4.00		●									
		GER	150-010EM	1.50	3.0	6.8	0.1		●					SIGER...E-EH	
			200-010EM	2.00					●						
			250-020EM	2.50					●						
			300-020EM	3.00	0.2		●								
			350-020EM	3.50			●								
			400-020EM	4.00			●								
			450-020EM	4.50		●									
			500-020EM	5.00		●									

-Dimension B shows available grooving depth.

Inserts are sold in 10 piece boxes.

●:Standard Stock

■ Applicable Insert

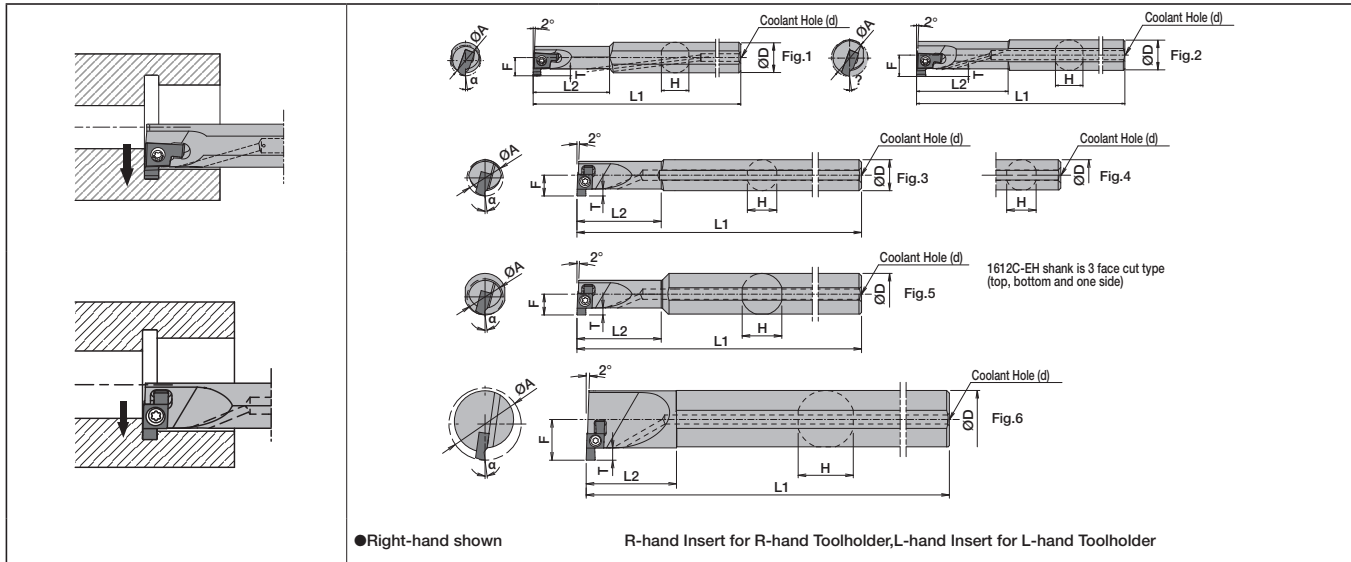
(mm)					M Stainless Steel								Indication of clasification	
Description	A	L	H	od	K Cast Iron									●:Light Interruption / 1st choice
GE [®] /...-C	5.8	11.48	4.05	2.8	N Non-ferrous Material									☺:Light Interruption / 2nd choice
GER...-CR					S Titanium alloy									●:Continuous / 1st choice
GE [®] /...-D	6.8	16.44	5.05	3.4	H Hardened Material (~40HRC)									○:Continuous / 2nd choice
GER...-DR					H Hardened Material (40HRC~)									
GE [®] /...-E	9.54	21.66	5.55	4.4										
Shape		Description		Dimension (mm)				Cermet	PVD coated		Carbide		Applicable Toolholder	
				W	B	C	re	TN6020	PR1025	GW15	KW10			
Right-handed insert shown									R	L	R	L	R	L
 2 Edge type		GE [®] /	100-005C	1.00	2.5	2.7	0.05	●	●	●	●	●	●	SIGE [®] /...C-EH SIGE [®] /...C-WH SIGER...C-WH-90
			120-005C	1.20				●	●	●	●	●	●	
			125-005C	1.25				●	●	●	●	●	●	
			140-005C	1.40				●	●	●	●	●	●	
			145-010C	1.45				●	●	●	●	●	●	
			150-010C	1.50				●	●	●	●	●	●	
			170-010C	1.70				●	●	●	●	●	●	
			185-010C	1.85				●	●	●	●	●	●	
			195-010C	1.95				●	●	●	●	●	●	
			200-010C	2.00				●	●	●	●	●	●	
			250-020C	2.50				●	●	●	●	●	●	
			300-020C	3.00				●	●	●	●	●	●	
			350-020C	3.50				●	●	●	●	●	●	
 2 Edge type	 GER100-005D~280-020D	GE [®] /	100-005D	1.00	2.5	4.8	0.05	●	●	●	●	●	●	SIGE [®] /...D-EH
			140-005D	1.40				●	●	●	●	●	●	
			145-010D	1.45				●	●	●	●	●	●	
			150-010D	1.50				●	●	●	●	●	●	
			170-010D	1.70				●	●	●	●	●	●	
			185-010D	1.85				●	●	●	●	●	●	
			195-010D	1.95				●	●	●	●	●	●	
			200-010D	2.00				●	●	●	●	●	●	
			225-010D	2.25				●	●	●	●	●	●	
			230-020D	2.30				●	●	●	●	●	●	
			250-020D	2.50				●	●	●	●	●	●	
			275-020D	2.75				●	●	●	●	●	●	
			280-020D	2.80				●	●	●	●	●	●	
			300-020D	3.00				●	●	●	●	●	●	
			330-020D	3.30				●	●	●	●	●	●	
			350-020D	3.50				●	●	●	●	●	●	
			400-020D	4.00				●	●	●	●	●	●	
 2 Edge type	 GER100-005E~430-020E	GE [®] /	100-005E	1.00	2.5	6.8	0.05	●	●	●	●	●	●	SIGE [®] /...E-EH
			150-010E	1.50				●	●	●	●	●	●	
			170-010E	1.70				●	●	●	●	●	●	
			185-010E	1.85				●	●	●	●	●	●	
			195-010E	1.95				●	●	●	●	●	●	
			200-010E	2.00				●	●	●	●	●	●	
			225-010E	2.25				●	●	●	●	●	●	
			230-020E	2.30				●	●	●	●	●	●	
			250-020E	2.50				●	●	●	●	●	●	
			275-020E	2.75				●	●	●	●	●	●	
			280-020E	2.80				●	●	●	●	●	●	
			300-020E	3.00				●	●	●	●	●	●	
			330-020E	3.30				●	●	●	●	●	●	
			350-020E	3.50				●	●	●	●	●	●	
			400-020E	4.00				●	●	●	●	●	●	
			430-020E	4.30				●	●	●	●	●	●	
			450-020E	4.50				●	●	●	●	●	●	
			460-020E	4.60				●	●	●	●	●	●	
			500-020E	5.00				●	●	●	●	●	●	
 Full-R		GER	200-100CR	2.00	2.5	2.7	1.0	●	●	●	●	●	SIGER...C-EH SIGER...C-WH SIGER...C-WH-90	
			250-125CR	2.50			1.25	●	●	●	●	●		
			300-150CR	3.00			1.5	●	●	●	●	●		
		GER	200-100DR	2.00	3.2	4.8	1.0	●	●	●	●	SIGER...D-EH		
			300-150DR	3.00			1.5	●	●	●	●		●	
								●	●	●	●		●	

·Dimension B shows available grooving depth.

Inserts are sold in 10 piece boxes.

●:Standard Stock

SIGE-EH Type Excellent Bar (With coolant hole)



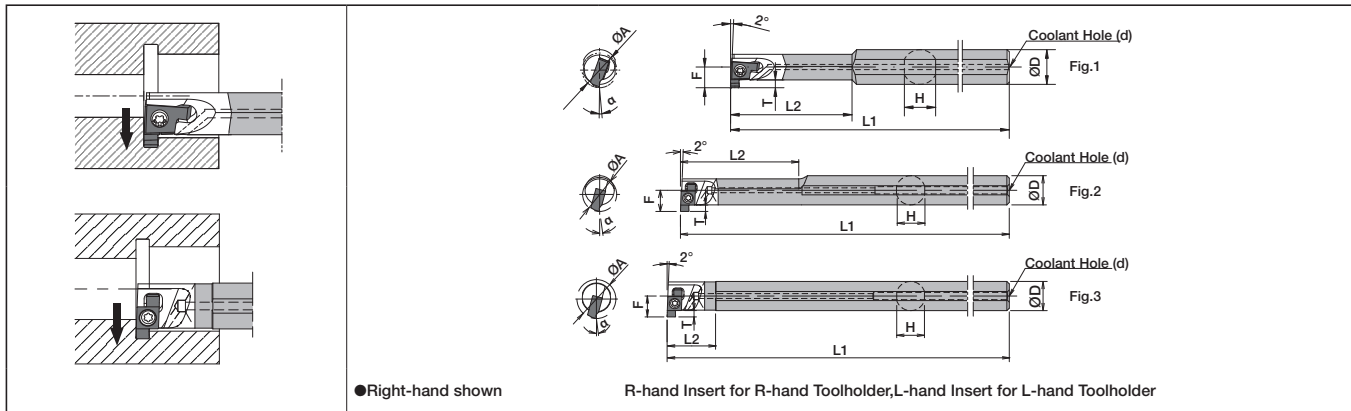
Toolholder Dimension

Description	Stock		Minimum cutting dia.	Dimensions (mm)							Shape	Spare Parts			Applicable Insert	
	R	L		øA	øD	H	L1	L2	F	T		ød	Clamp screw	Wrench		
														 FT		 DT
SIGE% 0808A-EH	●	●	8	8	7.2	100	20	4.8	1.5	3	Fig.1	SB-2045TRN	FT-6	-	GE%100-005A~GE%200-010A GER100-050AR~GER200-100AR	
1010B-EH	●	●	10	10	9	125	25	6.2	2.2	3	Fig.1 Fig.2	SB-2255TR	-	DT-7	GE%100-005B~GE%300-020B GER100-050BR~GER200-100BR	
1210B-EH	●	●	12				30	7								
1412C-EH	●	●	14	12	11.4	150	33	8	2.5	4	Fig.3 Fig.4	SB-2570TR	FT-8	-	GE%100-005C~GE%350-020C GER150-010CM~GER350-020CM GER200-100CR~GER300-150CR	
1612C-EH	●	●	16				20	8.5								
1616C-EH	●	●			16	15	160	36	9	5	Fig.5					
NEW 2020D-EH	●	●	20	20	19	180	40	12.1	4.5	5	Fig.5	SB-3080TR	FT-10	-	GE%100-005D~GE%400-020D GER150-010DM~GER400-020DM GER200-100DR~GER300-150DR	
2525E-EH	●	●	25	25	24	200	45	15.6	6.5	5						
3232E-EH	●	●	32	32	30.4	220	55	19				SB-4085TR	FT-15	-	GE%100-005E~GE%500-020E GER150-010EM~GER500-020EM	
4032E-EH	●	●	40			250	45	23				Fig.6				

●:Standard Stock

·Dimension T shows available grooving depth. Insert B dimension shows available grooving depth.

SIGE-WH Type Carbide Anti-vibration Bar (with coolant hole)



Toolholder Dimension

Description	Stock		Minimum cutting dia.	Dimensions (mm)							Shape	Spare Parts			Applicable Insert	
	R	L		øA	øD	H	L1	L2	F	T		ød	Clamp screw	Wrench		
														 FT		 DT
SIGE% 0808A-WH	●	●	8	8	7.2	125	28	4.8	1.5	3	Fig.1	SB-2045TRN	FT-6	-	GE%100-005A~GE%200-010A GER100-050AR~GER200-100AR	
1010B-WH	●	●	10	10	9	125	35	6.2	2.2	3		SB-2255TR	-	DT-7	GE%100-005B~GE%300-020B GER100-050BR~GER200-100BR	
1210B-WH	●	●	12			140	45	7				SB-2255TR	-	DT-7	GE%100-005B~GE%300-020B GER100-050BR~GER200-100BR	
1412C-WH	●	●	14	12	11.4	150	50	8.7	2.5	4	Fig.2	SB-2570TR	FT-8	-	GE%100-005C~GE%350-020C GER150-010CM~GER350-020CM GER200-100CR~GER300-150CR	
1612C-WH	●	●	16			180	20	8.5			Fig.3					

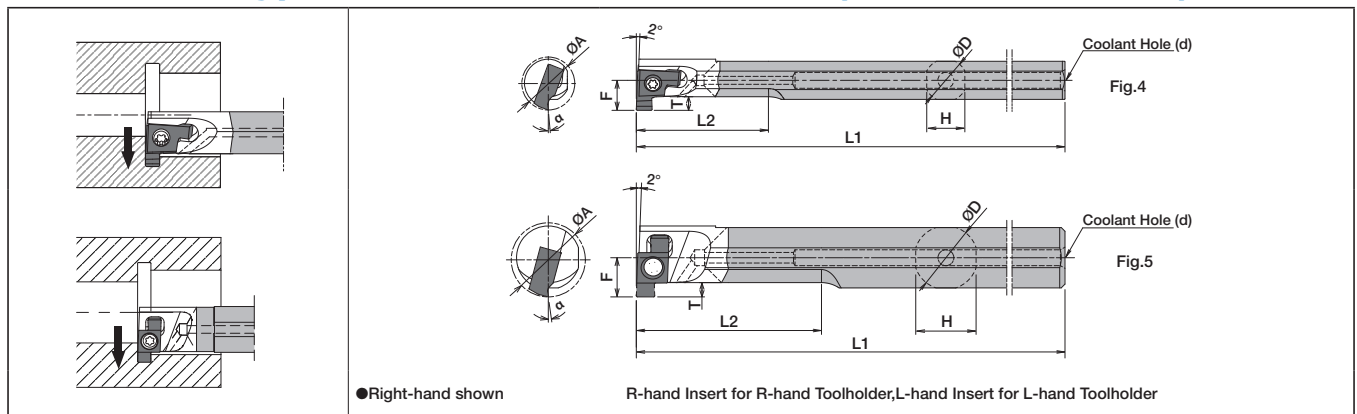
●:Standard Stock

·Dimension T shows available grooving depth. Insert B dimension shows available grooving depth.

For automatic lathe

NEW

■ SIGE-WH Type Carbide anti vibration Bar (With coolant hole)

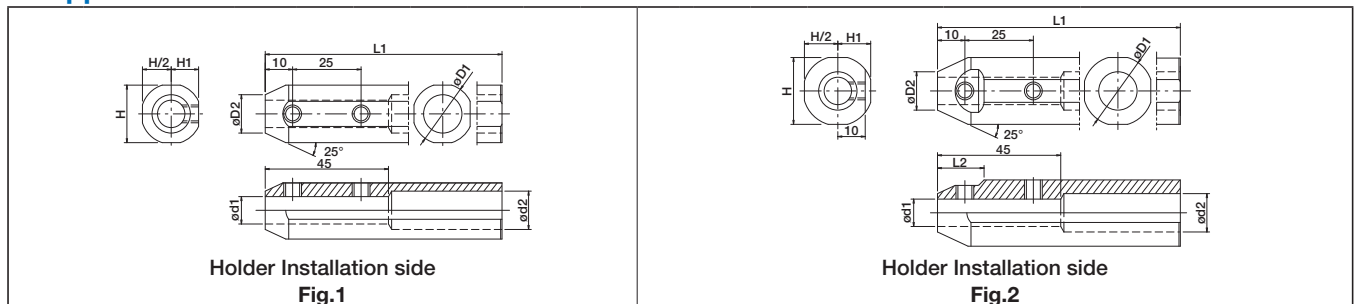


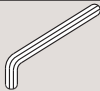
● Toolholder Dimension

Description	Stock	Minimum cutting dia.	Dimensions (mm)							Shape	Spare Parts			Applicable Insert
											Clamp screw	Wrench		
					H	L1	L2	F	T		ød		 FT	
SIGER 1008B-WH-90	▲	10	8	7.2	90	25	5.6	2.2	3	Fig.4	SB-2255TR	-	DT-7	GER100-005B~GER300-020B GER100-050BR~GER200-100BR
1210B-WH-90	▲	12	10	9.4		30	6.6							
1412C-WH-90	▲	14	12	11.4	90	35	7.4	2.5	3	Fig.5	SB-2570TR	FT-8	-	GER100-005C~GER350-020C GER150-010CM~GER350-020CM GER200-100CR~GER300-150CR

▲:Scheduled to be in stock

● Applicable Sleeve



Description		Stock	Dimensions (mm)								Shape	Spare Parts		Applicable Machine Manufacturer			
												Screw	Wrench				
			ød1	øD1	øD2	ød2	H	H1	L1	L2							
SHA	0820-120	▲	8	20	14	12	19	9.25	120	-	Fig.1	HS6x4P	LW-3	Amada Washino Eguro Tsugami Miyano General Purpose			
	1020-120	▲	10														
SHA	0825.0-135	▲	8	25	14	14	24	11.5	135	17	Fig.2						
	1025.0-135	▲	10												16		
	1225.0-135	▲	12														
SHA	0819-120	▲	8	19.05	14	12	18	8.75	120	-	Fig.1	HS6x4P	LW-3	Citizen Machinery			
	1019-120	▲	10														
SHA	0820-120	▲	8	20	14	12	19	9.25	120	-	Fig.1						
	1020-120	▲	10														
SHA	0825.4-120	▲	8	25.4	14	14	24.4	12	120	17	Fig.2						
	1025.4-120	▲	10												16		
	1225.4-120	▲	12														
SHA	0822-125	▲	8	22	14	14	21	10	125	-	Fig.1	HS6x4P	LW-3	Star Micronics Nomura VTC			
	1022-125	▲	10												16		
	1222-125	▲	12														
SHA	0823-120	▲	8	23	14	14	22	10.5	120	16	Fig.2	HS6x4P	LW-3	Nomura VTC			
	1023-120	▲	10												16		
	1223-120	▲	12														

*Length of ød1 section 45mm (all SHA types)

▲:Scheduled to be in stock

Recommended cutting conditions (Ground Chipbreaker : GE^{R/L}...A(R),GE^{R/L}...B(R))

Workpiece Material	Recommended Insert Grade (Cutting Speed : m/min)			① f at Grooving (mm/rev)			Remark
				② f at Traversing (mm/rev)			
	Cermet	PVD Coated	Carbide	③ ap at Traversing (mm)			
				TN6020	PR1025	KW10	
Carbon Steel (SxxC)	☆ 50~80	★ 50~80	-	①0.01~0.03	①0.02~0.04	①0.02~0.04	Coolant
				②0.01~0.03	②0.02~0.04	②0.02~0.04	
				③Max. 0.05	③Max. 0.05	③Max. 0.1	
Alloy Steel (SCM)	☆ 50~80	★ 50~80	-	①0.01~0.03	①0.02~0.04	①0.02~0.04	
				②0.01~0.03	②0.02~0.04	②0.02~0.04	
				③Max. 0.05	③Max. 0.05	③Max. 0.1	
Stainless Steel (SUS304)	-	★ 50~80	-	①0.01~0.03	①0.01~0.03	①0.01~0.03	
				②0.01~0.03	②0.01~0.03	②0.01~0.03	
				③Max. 0.05	③Max. 0.05	③Max. 0.1	
Cast Iron(FC FCD)	-	-	★ 50~80	①0.01~0.03	①0.02~0.04	①0.02~0.04	
				②0.01~0.03	②0.02~0.04	②0.02~0.04	
				③Max. 0.05	③Max. 0.05	③Max. 0.1	
Aluminum	-	-	★ 50~100	①0.01~0.03	①0.02~0.04	①0.02~0.04	
				②0.01~0.03	②0.02~0.04	②0.02~0.04	
				③Max. 0.1	③Max. 0.1	③Max. 0.2	
Brass	-	-	★ 50~100	①0.01~0.03	①0.02~0.04	①0.02~0.04	
				②0.01~0.03	②0.02~0.04	②0.02~0.04	
				③Max. 0.1	③Max. 0.1	③Max. 0.2	

*Use PVD coated grade or carbide for traversing with edge width 1mm.(GE^{R/L}100-005A / 100-005B)

★:1st Recommendation
☆:2nd Recommendation

Recommended cutting conditions (Ground Chipbreaker : GE^{R/L}...C(R),GE^{R/L}...D(R),GE^{R/L}...E)

Workpiece Material	Recommended Insert Grade (Cutting Speed : m/min)			① f at Grooving (mm/rev)							Remark
				② f at Traversing (mm/rev)							
				③ ap at Traversing (mm)							
	Cermet	PVD Coated	Carbide	GE% 100-200-010C 200-100CR	GE% 250-350-020C 250-300-150CR						
	TN6020	PR1025	GW15	GE% 100-145-010D	GE% 150-195-010D	GE% 200-280-020D 200-100DR		GE% 300-400-020D 300-150DR			
				GE% 100-010E	GE% 150-195-010E	GE% 200-225-010E 230-020E	GE% 250-330-020E		GE% 350-430-020E	GE% 450-500-020E	
Carbon Steel (SxxC)	☆ 120~180	★ 60~140	-	①0.03~0.08	①0.03~0.08	①0.04~0.09	①0.04~0.09	①0.05~0.12	①0.05~0.12	①0.05~0.12	Coolant
				②0.03~0.08	②0.03~0.08	②0.04~0.09	②0.04~0.09	②0.05~0.1	②0.05~0.1	②0.05~0.1	
				③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.5	③Max. 0.5	③Max. 0.5	
Alloy Steel (SCM)	☆ 100~160	★ 60~120	-	①0.03~0.07	①0.03~0.07	①0.04~0.08	①0.04~0.08	①0.05~0.1	①0.05~0.1	①0.05~0.1	
				②0.03~0.1	②0.03~0.1	②0.04~0.08	②0.04~0.08	②0.05~0.1	②0.05~0.1	②0.05~0.1	
				③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.5	③Max. 0.5	③Max. 0.5	
Stainless Steel (SUS304)	☆ 70~130	★ 60~110	-	①0.03~0.07	①0.03~0.07	①0.04~0.08	①0.04~0.08	①0.05~0.1	①0.05~0.1	①0.05~0.1	
				②0.03~0.1	②0.03~0.1	②0.04~0.08	②0.04~0.08	②0.05~0.1	②0.05~0.1	②0.05~0.1	
				③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.5	③Max. 0.5	③Max. 0.5	
Cast Iron(FC FCD)	-	-	★ 60~100	①0.03~0.08	①0.03~0.08	①0.04~0.09	①0.04~0.09	①0.05~0.12	①0.05~0.12	①0.05~0.12	
				②0.03~0.08	②0.03~0.08	②0.04~0.09	②0.04~0.09	②0.05~0.1	②0.05~0.1	②0.05~0.1	
				③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.3	③Max. 0.5	③Max. 0.5	③Max. 0.5	
Aluminum	-	-	★ 150~300	①0.05~0.12	①0.05~0.12	①0.05~0.15	①0.05~0.15	①0.08~0.15	①0.08~0.15	①0.08~0.15	
				②0.05~0.12	②0.05~0.12	②0.05~0.15	②0.05~0.15	②0.08~0.15	②0.08~0.15	②0.08~0.15	
				③Max. 0.5	③Max. 0.5	③Max. 0.5	③Max. 0.5	③Max. 0.8	③Max. 0.8	③Max. 0.8	
Brass	-	-	★ 100~250	①0.05~0.12	①0.05~0.12	①0.05~0.15	①0.05~0.15	①0.08~0.15	①0.08~0.15	①0.08~0.15	
				②0.05~0.12	②0.05~0.12	②0.05~0.15	②0.05~0.15	②0.08~0.15	②0.08~0.15	②0.08~0.15	
				③Max. 0.5	③Max. 0.5	③Max. 0.5	③Max. 0.5	③Max. 0.8	③Max. 0.8	③Max. 0.8	

*Use PVD coated grade or carbide for traversing with edge width 1mm.(GE^{R/L}100-010C / 100-010D / 100-010E)

★:1st Recommendation
☆:2nd Recommendation

Recommended cutting conditions (3-D Molded Chipbreaker)

Workpiece Material	Recommended Insert Grade (Cutting Speed : m/min)			① f at Grooving (mm/rev)						Remark			
				② f at Traversing (mm/rev)									
	Cermet	PVD Coated	Carbide	③ ap at Traversing (mm)									
				TN6020	PR1025	GW15	GER 150-200-010CM	GER 250-350-020CM					
							GER 150-200-010DM		GER 230-250-020DM		GER 300-400-020DM		
			GER 150-200-010EM		GER 250-300-020EM	GER 350-400-020EM	GER 450-500-020EM						
Carbon Steel (SxxC)	-	★ 60~160	-	①0.03~0.1	①0.03~0.12	①0.04~0.12	①0.05~0.12	①0.05~0.12	①0.05~0.12	Coolant			
				②0.03~0.1	②0.03~0.1	②0.04~0.1	②0.05~0.1	②0.05~0.1	②0.05~0.1				
				③Max. 1.0	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5				
Alloy Steel (SCM)	-	★ 60~140	-	①0.03~0.1	①0.03~0.1	①0.04~0.12	①0.05~0.12	①0.05~0.12	①0.05~0.12				
				②0.03~0.1	②0.03~0.1	②0.04~0.1	②0.05~0.1	②0.05~0.1	②0.05~0.1				
				③Max. 1.0	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5				
Stainless Steel (SUS304)	-	★ 60~110	-	①0.03~0.08	①0.03~0.08	①0.04~0.08	①0.05~0.1	①0.05~0.1	①0.05~0.1				
				②0.03~0.1	②0.03~0.1	②0.04~0.1	②0.05~0.1	②0.05~0.1	②0.05~0.1				
				③Max. 1.0	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5	③Max. 1.5				

★:1st Recommendation
☆:2nd Recommendation