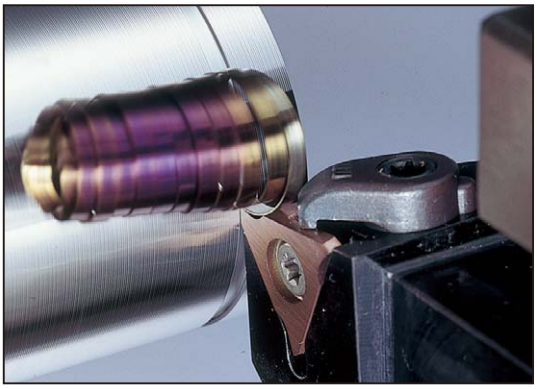
GWC Type



Characteristics of GWC Series

- Similar insert can be use for both external and internal grooving
- Full range of insert grades to cover a wide range of work materials available
  Coated Carbide AC530U, Uncoated Carbide H1,
  Coated Cermet T3000Z,
  Cermet T1500A/T1200A,
  SUMIBORON BN2000/BN250,
  SUMIDIA DA2200.
- A wide variation of grooving widths from 0.33mm to 4.8mm
- Insert with Chipbreaker, SumiTurn B-Groove, are now stocked
- Customers can modify the grooving width, nose radius and rake angle according to their own requirements using the grooving insert blanks (* Sumitomo Electric Hardmetal also accepts special orders.)

External Shallow Grooves

External

Fig. 1

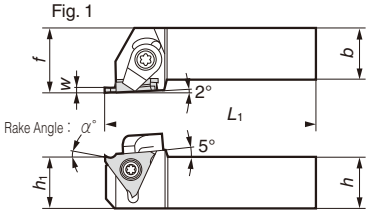


Fig. 2

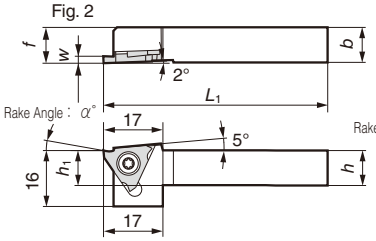
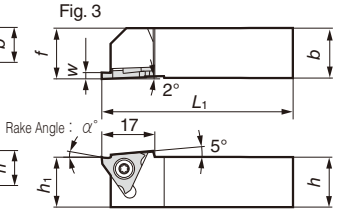


Fig. 3



Note 1: Refer to insert table on F5 for α° dimensions.
Note 2: Figures show right hand tools.

■ Holders

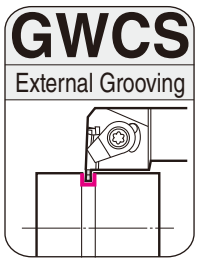
Right handed holders are applicable with right handed inserts.

■ Spare Parts

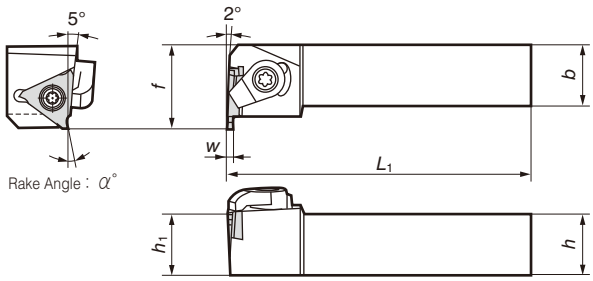
Cat. No.	Stock R	Stock L	Dimensions (mm) h	b	L_1	f	h_1	Fig.	Grooving Width (mm) w	Max. Grooving Depth (mm)	* Group No.	Screw	Recommended Tightening Torque (N · m)	Spanner	Clamp	Double Screw	Spanner
GWC R/L1010-3	●	●	10	10	125	10	10	2	**0.33 to 2.80**	**0.8 to 2.5**	❶	BFTX0409N	**3.4**	TRX15	—	—	—
GWC R/L1212-3	●	●	12	12	125	12	12	2	**0.33 to 2.80**	**0.8 to 2.5**	❶						
GWC R/L1616-3	●	●	16	16	125	16	16	3	**0.33 to 2.80**	**0.8 to 2.5**	❶						
GWC R/L2020-3	●	●	20	20	125	25	20	1	**0.33 to 2.80**	**0.8 to 2.5**	❶	BFTX0409N	**3.4**	TRX15	CCM6B L/R	WB6-20T/TL	LT20
GWC R/L2525-3	●	●	25	25	150	30	25	1	**0.33 to 2.80**	**0.8 to 2.5**	❶						
GWC R/L2020-15	●	●	20	20	125	25	20	1	**1.00 to 1.45**	**2.0**	❷	BFTX0511N	**5.0**	TRX20	CCM8U L/R	WB8-22T/TL	LT27
GWC R/L2020-25	●	●	20	20	125	25	20	1	**1.50 to 2.30**	**3.5**	❸						
GWC R/L2020-35	●	●	20	20	125	25	20	1	**2.50 to 4.80**	**5.0**	❹						
GWC R/L2525-15	●	●	25	25	150	30	25	1	**1.00 to 1.45**	**2.0**	❷						
GWC R/L2525-25	●	●	25	25	150	30	25	1	**1.50 to 2.30**	**3.5**	❸						
GWC R/L2525-35	●	●	25	25	150	30	25	1	**2.50 to 4.80**	**5.0**	❹						

* Refer to pages F6, F7, and F8 for applicable TGA type inserts. Select applicable inserts for the holders by using matching group numbers.

External L-Styled (Side Cut)



External



Note 1: Refer to insert table on this page for α° dimensions.
Note 2: Figures show right hand tools.

Holders

Right handed holders are applicable with left handed inserts.

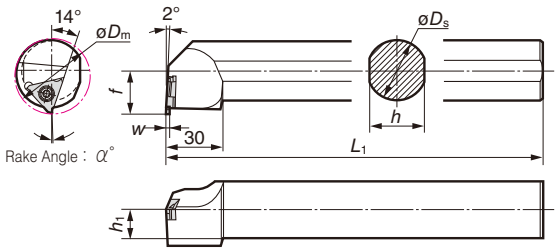
Cat. No.	Stock		Dimensions (mm)					Grooving Width (mm)	Max. Grooving Depth (mm)	* Group No.	Screw	Recommended Tightening Torque (N · m)	Spanner	Clamp	Double Screw	Spanner
	R	L	h	b	L_1	f	h_1	w								
GWCS R/L2020-3	●	●	20	20	125	25	20	**0.33 to 2.80**	**0.8 to 2.5**	❶	BFTX0409N	**3.4**	TRX15	CCM6BR/L	WB6-20TL/T	LT20
GWCS R/L2525-3	●	●	25	25	150	30	25	**0.33 to 2.80**	**0.8 to 2.5**	❶						
GWCS R/L2020-15	●	●	20	20	125	27	20	**1.00 to 1.45**	**2.0**	❷						
GWCS R/L2020-25	●	●	20	20	125	27	20	**1.50 to 2.30**	**3.5**	❸						
GWCS R/L2020-35	●	●	20	20	125	27	20	**2.50 to 4.80**	**5.0**	❹						
GWCS R/L2525-15	●	●	25	25	150	32	25	**1.00 to 1.45**	**2.0**	❷	BFTX0511N	**5.0**	TRX20	CCM8UR/L	WB8-22TL/T	LT27
GWCS R/L2525-25	●	●	25	25	150	32	25	**1.50 to 2.30**	**3.5**	❸						
GWCS R/L2525-35	●	●	25	25	150	32	25	**2.50 to 4.80**	**5.0**	❹						

* Refer to pages F6, F7, and F8 for TGA type inserts applicable with the GWCS holder.
Select applicable inserts for the holders by using matching group numbers.

Spare Parts

Internal Grooving

Internal



Note 1: Refer to insert table on this page for α° dimensions.
Note 2: Figures show right hand tools.

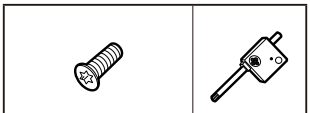
Holders

Right handed holders are applicable with left handed inserts.

Cat. No.	Stock		Dimensions (mm)					Min. Bore	Grooving Width (mm)	Max. Grooving Depth (mm)	* Group No.	Screw	Recommended Tightening Torque (N · m)	Spanner
	R	L	øDs	h	L_1	f	h_1	øDm	w					
GWCI R/L325	●	●	25	23	220	17.5	11.5	35	**0.33 to 2.80**	**0.5 to 2.0**	❶	BFTX0409N	**3.4**	TRX15
GWCI R/L432	●	●	32	30	250	23.0	15.0	40	**1.25 to 4.80**	**1.7 to 2.5**	❷❸❹	BFTX0511N	**5.0**	TRX20

* Refer to pages F6, F7, and F8 for TGA type inserts applicable with the GWCI holder.
Select applicable inserts for the holders by using matching group numbers.

Spare Parts

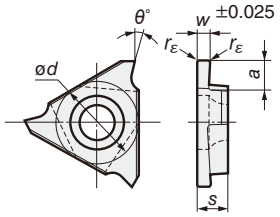


Rake Angle when Fitted on Holder (α°)

	Coated Carbide	Carbide	Coated Cermet	Cermet		SUMIBORON		SUMIDIA
	AC530U	H1	T3000Z	T1500A	T1200A	BN2000	BN250	DA2200
Ext. Grooving GWC GWCS	10°	20°	10°	5°	5°	0°	0°	10°
Int. Grooving GWCI	1°	11°	1°	− 4°	− 4°	− 9°	− 9°	1°

TGA Type

Insert



Above figures show right hand tools.

Grade		Cutting Edge	θ°
Coated Carbide	AC530U	Honing	15°
Carbide	H1	Sharp	25°
Coated Cermet	T3000Z	Honing	15°
Cermet	T1500A	Sharp	10°
	T1200A	Sharp	10°
SUMIBORON	BN2000	Negative Land	5°
	BN250	Negative Land	5°
SUMIDIA	DA2200	Sharp	15°

* For rake angle when fitted on the holder, refer to page F5.

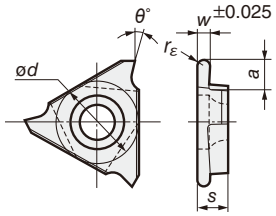
Cat. No. (Add E to the end of the Cat. No. for T1500A and T1200A grades)	Coated Carbide AC530U		Carbide H1		Coated Cermet T3000Z		Cermet T1500A		Cermet T1200A		SUMIBORON BN2000		SUMIBORON BN250		SUMIDIA DA2200		Grooving Width (mm)	Max. Grooving Depth (mm)		Dimensions (mm)				* Group No.
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	w	External	Internal	a	r_ε	ød	s	
TGA R/L3033(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	—	—	0.33	0.8	0.5	1.0	0.05	9.525	3.18	❶
TGA R/L3050(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	—	—	0.50	1.2	0.8	1.4				
TGA R/L3075(E)	●	●	●	●	●	●	●	●	▲	▲			—	—			0.75	2.0	1.5	2.5	0.1 0.2 for T1500A/T1200A			
TGA R/L3095(E)	●	●	●	●	●	●	●	●	▲	▲			—	—			0.95							
TGA R/L3100(E)	●	●	●	●	●	●	●	●	▲	▲							1.00							
TGA R/L3110(E)	●	●			●	●	●	●	▲	▲							1.10							
TGA R/L3125(E)	●	●	●	●	●	●	●	●	▲	▲							1.25							
TGA R/L3135(E)	●	●			●	●	●	●	▲	▲							1.35							
TGA R/L3145(E)	●	●	●	●	●	●	●	●	▲	▲							1.45							
TGA R/L3150(E)	●	●	●	●	●	●	●	●	▲	▲							1.50							
TGA R/L3165(E)	●	●			●	●	●	●	▲	▲							1.65							
TGA R/L3175(E)	●	●			●	●	●	●	▲	▲							1.75							
TGA R/L3185(E)	●	●	●	●	●	●	●	●	▲	▲							1.85							
TGA R/L3200(E)	●	●	●	●	●	●	●	●	▲	▲							2.00	2.5	2.0	3.0				
TGA R/L3220(E)	●	●			●	●	●	●	▲	▲							2.20							
TGA R/L3230(E)	●	●	●	●	●	●	●	●	▲	▲							2.30							
TGA R/L3250(E)	●	●	●	●	●	●	●	●	▲	▲							2.50							
TGA R/L3265(E)	●	●			●	●	●	●	▲	▲							2.65							
TGA R/L3270(E)	●	●			●	●	●	●	▲	▲							2.70							
TGA R/L3280(E)	●	●			●	●	●	●	▲	▲							2.80							
TGA R/L4125(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		1.25	2.0	1.7	2.5	0.2 ＊2	12.70	4.76	❷
TGA R/L4145(E)	●	●	●	●	●	●	●	●	▲	▲							1.45							
TGA R/L4150(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		1.50	3.5	2.5	3.9				❸
TGA R/L4165(E)	●	●			●	●	●	●	▲	▲							1.65							
TGA R/L4175(E)	●	●	●	●	●	●	●	●	▲	▲							1.75							
TGA R/L4185(E)	●	●	●	●	●	●	●	●	▲	▲							1.85							
TGA R/L4200(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		2.00							
TGA R/L4220(E)	●	●			●	●	●	●	▲	▲							2.20							
TGA R/L4230(E)	●	●	●	●	●	●	●	●	▲	▲							2.30							
TGA R/L4250(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		2.50	5.0 ＊1	2.5	5.4 ＊1	0.3 ＊2			❹
TGA R/L4265(E)	●	●	●	●	●	●	●	●	▲	▲							2.65							
TGA R/L4270(E)	●	●			●	●	●	●	▲	▲							2.70							
TGA R/L4280(E)	●	●	●	●	●	●	●	●	▲	▲							2.80							
TGA R/L4300(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		3.00							
TGA R/L4320(E)	●	●			●	●	●	●	▲	▲							3.20							
TGA R/L4330(E)	●	●	●	●	●	●	●	●	▲	▲							3.30							
TGA R/L4350(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		3.50							
TGA R/L4370(E)	●	●			●	●	●	●	▲	▲							3.70							
TGA R/L4390(E)	●	●			●	●	●	●	▲	▲							3.90							
TGA R/L4400(E)	●	●	●	●	●	●	●	●	▲	▲	●		▲		●		4.00				0.4 ＊2			
TGA R/L4410(E)	●	●			●	●	●	●	▲	▲							4.10							
TGA R/L4420(E)	●	●			●	●	●	●	▲	▲							4.20							
TGA R/L4430(E)	●	●	●	●	●	●	●	●	▲	▲							4.30							
TGA R/L4440(E)	●	●			●	●	●	●	▲	▲							4.40							
TGA R/L4450(E)	●	●	●	●	●	●	●	●	▲	▲							4.50							
TGA R/L4480(E)	●	●	●	●	●	●	●	●	▲	▲							4.80						5.00	

* Refer to pages F4, F5 for applicable holders GWC, GWCS and GWCI types. Select applicable inserts for the holders by using matching group numbers.

＊ 1: SUMIBORON, SUMIDIA is a = 4.4 (4.0)
＊ 2: SUMIBORON is r_ε = 0.2, SUMIDIA is r_ε = 0.1

▲ mark : To be replaced by new item (Please confirm stock availability)

■ Insert



Above figures show right hand tools.

Grade		Cutting Edge	θ°
Coated Carbide	AC530U	Honing	15°
Carbide	H1	Sharp	25°
Coated Cermet	T3000Z	Honing	15°
SUMIBORON	BN2000	Negative Land	5°
SUMIDIA	DA2200	Sharp	15°

* For rake angle when fitted on the holder, refer to page F5.

Cat. No.	Coated Carbide AC530U		Carbide H1		Coated Cermet T3000Z				SUMIBORON BN2000		SUMIDIA DA2200		Grooving Width (mm)	Max. Grooving Depth (mm)		Dimensions (mm)				* Group No.
	R	L	R	L	R	L			R	L	R	L	w	External	Internal	a	r_ε	ød	s	
TGA R/L4050R	●	●	●	●	●								**1.00**	**2.0**	**1.7**	2.5	0.50	12.70	4.76	❷
TGA R/L4075R	●	●	●	●	●								**1.50**	**3.5**	**2.5**	3.9	0.75			❸
TGA R/L4100R	●	●	●	●	●								**2.00**				1.00			
TGA R/L4125R	●	●	●	●	●								**2.50**	**5.0** ＊1	**2.5**	5.4 ＊1	1.25			❹
TGA R/L4150R	●	●	●	●	●								**3.00**				1.50			
TGA R/L4200R	●	●	●	●	●								**4.00**				2.00			

* Refer to pages F4, F5 for applicable holders GWC, GWCS and GWCI types. Select applicable inserts for the holders by using matching group numbers.

＊ 1: SUMIBORON, SUMIDIA is a = 4.4 (4.0) Max. grooving depth 4.0 (Boring bars 2.5)

■ Recommended Cutting Conditions

Work Material	P General Steel			M Stainless Steel			N Non-Ferrous Metal		H Hardened Steel
Grade	AC530U	T3000Z	T1500A/T1200A	AC530U	T3000Z	T1500A/T1200A	H1	DA2200	BN2000/BN250
Cutting Speed v_c (m/min)	50 to 200	100 to 180	100 to 180	50 to 200	80 to 150	80 to 120	200 to 300	200 to 300	80 to 120
Feed Rate f (mm/rev)	0.02 to 0.10	0.05 to 0.10	0.05 to 0.08	0.02 to 0.10	0.05 to 0.08	0.05 to 0.08	0.05 to 0.15	0.05 to 0.15	0.03 to 0.07

● Ordering Special TGA Type Inserts

Use the "Special Insert Request Form" on page F9 when ordering special inserts (with different shapes, grooving widths, and cutting edge lengths). Make a copy of the form, fill it out, and send it to a Sumitomo Electric Hardmetal dealer or distributor.

■ Insert Blanks

(Uncompleted inserts: Grooving width, nose radius and rake angle modification required)

Fig. 1

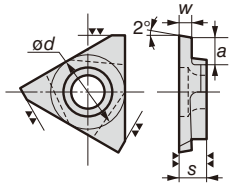
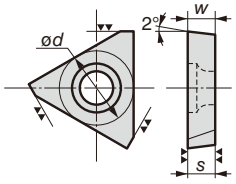


Fig. 2



Above figures show right hand tools.

Cat. No.	Carbide KH03		Carbide H1		Carbide EH510		Cermet T1500A		Cermet T1200A		Dimensions (mm)				Fig.
	R	L	R	L	R	L	R	L	R	L	w	a	ød	s	
TGA R/L3-T18	●	●	●	●	●	●	●	●	▲	▲	1.85	(3.4)	9.525	3.18	1
TGA R/L3-T23	●	●	●	●	●	●	●	●	▲	▲	2.35	(3.4)	9.525	3.18	1
TGA R/L3-T31	●	●	●	●	●	●	●	●	▲	▲	3.18	—	9.525	3.18	2
TGA R/L4-T22	●	●	●	●	●	●	●	●	▲	▲	2.20	(4.8)	12.70	4.76	1
TGA R/L4-T37	●	●	●	●	●	●	●	●	▲	▲	3.75	(6.2)	12.70	4.76	1
TGA R/L4-T47	●	●	●	●	●	●	●	●	▲	▲	4.76	—	12.70	4.76	2

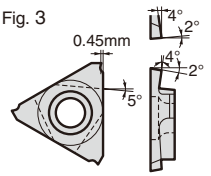
Note: Figures in parentheses are reference values.

■ Precautions When Modifying Inserts

When modifying the rake face, please refer to the dimensions in Fig. 3. Dimensions shown in Fig. 4 is when the insert is mounted on the holder.

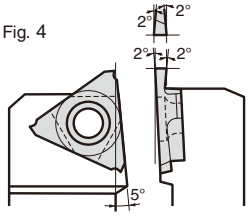
Recommended Modification

Fig. 3



Mounted Insert Dimensions

Fig. 4



* Sumitomo Electric Hardmetal also accepts special orders. Use the "Special Insert Request Form" on page F9 when ordering.

▲ mark : To be replaced by new item (Please confirm stock availability)

SumiTurn B-Groove

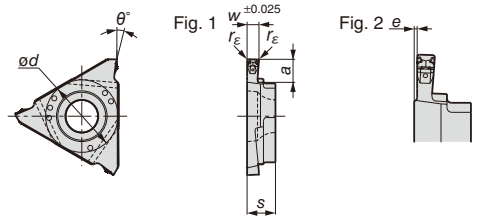
General Features

To solve chip control problems, grooving inserts with SumiTurn B-Groove (BF Type) chipbreakers have been added to the TGA Type insert line-up.

Characteristics

- Achieving good chip control in a wide range of grooving processes.
- Good chip control during final wide groove touch-up with traverse tool movement.
- A selection of 14 models for snap ring applications are available in edge widths from 1.4 to 4.5 mm for a total of 60 models.
- The AC530U grade with Super ZX Coat for a longer tool life, is now available to cover various work materials from Steel, Stainless Steel to Non-ferrous metals.

Chipbreaker Insert for Square Grooves BF Type



Cat. No.	Coated Carbide AC530U R	L	Grooving Width (mm) w	Max. Grooving Depth (mm) External	Internal	Dimensions (mm) a	rε	ød	s	e	Fig.	* Group No.
TGA R/L4140BF01	●	●	1.40	2.0	1.7	2.5	0.1	12.70	4.76	0.300	2	❷
TGA R/L4165BF01	●	●	1.65	3.5	2.5	3.9	0.1	12.70	4.76	0.175	2	❸
TGA R/L4190BF01	●	●	1.90							0	1	
TGA R/L4220BF01	●	●	2.20									
TGA R/L4270BF02	●	●	2.70	5.0	2.5	5.4	0.2	12.70	4.76	0	1	❹
TGA R/L4320BF02	●	●	3.20									
TGA R/L4420BF02	●	●	4.20									
TGA R/L4150BF	●	●	1.50	3.5	2.5	3.9	0.2	12.70	4.76	0.250	2	❸
TGA R/L4165BF	●	●	1.65							0.175		
TGA R/L4175BF	●	●	1.75							0.125		
TGA R/L4185BF	●	●	1.85							0.075		
TGA R/L4200BF	●	●	2.00							0	1	
TGA R/L4220BF	●	●	2.20									
TGA R/L4230BF	●	●	2.30									
TGA R/L4250BF	●	●	2.50	5.0	2.5	5.4	0.3	12.70	4.76	0	1	❹
TGA R/L4265BF	●	●	2.65									
TGA R/L4270BF	●	●	2.70									
TGA R/L4280BF	●	●	2.80									
TGA R/L4300BF	●	●	3.00									
TGA R/L4320BF	●	●	3.20									
TGA R/L4330BF	●	●	3.30									
TGA R/L4350BF	●	●	3.50									
TGA R/L4370BF	●	●	3.70									
TGA R/L4390BF	●	●	3.90									
TGA R/L4400BF	●	●	4.00				0.4					
TGA R/L4410BF	●	●	4.10									
TGA R/L4420BF	●	●	4.20									
TGA R/L4430BF	●	●	4.30									
TGA R/L4440BF	●	●	4.40									
TGA R/L4450BF	●	●	4.50									

Grade		Cutting Edge	θ°
Coated Carbide	AC530U	Honing	15°

* For rake angle when fitted on the holder, refer to page F5.

Note 1: Please note that cutting edge dimension e differs, for grooving widths below 1.85mm.
Note 2: Figures show right hand tools.

B-Groove ビーグルーブ

Recommended Cutting Conditions

Work Material	Process	Cutting Conditions		Grooving Width w (mm) 1.4 to 2.3	2.5 to 3.3	3.5 to 4.5
P General Steel	Cutting Speed v_c (m/min)			50 to 180	50 to 180	50 to 180
	Grooving	Feed Rate f (mm/rev)		0.03 to 0.12	0.04 to 0.12	0.05 to 0.12
		Depth of Cut a_p (mm)	External Diameter	UP to 3.5	UP to 5.0	UP to 5.0
			Internal Diameter	UP to 2.5	UP to 2.5	UP to 2.5
	Turning	Feed Rate f (mm/rev)		0.03~0.10	0.05~0.10	0.07~0.12
		Depth of Cut a_p (mm)		UP to 0.3	UP to 0.5	UP to 0.7
M Stainless Steel	Cutting Speed v_c (m/min)			50 to 160	50 to 160	50 to 160
	Grooving	Feed Rate f (mm/rev)		0.03 to 0.12	0.04 to 0.12	0.05 to 0.12
		Depth of Cut a_p (mm)	External Diameter	UP to 3.5	UP to 5.0	UP to 5.0
			Internal Diameter	UP to 2.5	UP to 2.5	UP to 2.5
	Turning	Feed Rate f (mm/rev)		0.03 to 0.10	0.05 to 0.10	0.07 to 0.12
		Depth of Cut a_p (mm)		UP to 0.3	UP to 0.5	UP to 0.7

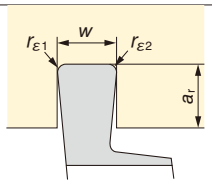
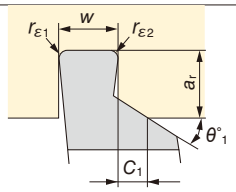
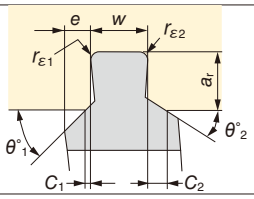
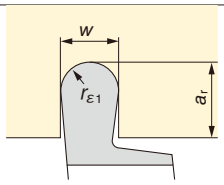
* Refer to pages F4, F5 for applicable holders GWC, GWCS and GWCI types. Select applicable inserts for the holders by using matching group numbers.

This form is applicable to Japan domestic market only

This form applies to the GWC Type (page F4), GWCS Type (page F5), GWCI Type (page F5) inserts.

To order special grooving inserts, fill out the form below (indicate preference by circling the item, or specify dimensions), and send it to a Sumitomo Electric Hardmetal dealer or distributor. (Make a copy of this form.)
For grooving inserts in a different shape, groove width, cutting edge length, or grade not listed below, contact your nearest Sumitomo Electric Hardmetal dealer or distributor.

Your Company/Contact Information (Phone/Fax/Address, etc.)

Type	①	②	③	④
Shape				
Uses	Internal Grooving, External Grooving			
Holders	GWC Type (page F4), GWCS Type (page F5), GWCI Type (page F5)			
Direction	Right-hand (R), Left-hand (L)			
Insert Size	"3" • • • ø9.525 "4" • • • ø12.70			
w				
a_r				
C_1				
C_2				
e				
$r_{\varepsilon 1}$				
$r_{\varepsilon 2}$				
θ°_1				
θ°_2				
Grades				
Quantity				
Remarks				

Form instructions

1. The above illustration shows only external right-hand and internal left-hand inserts. (The inserts for an external left-hand and internal right-hand will be opposite the above illustration.)
2. Two insert sizes are available.
   3 : Inscribed circle 9.525mm
   4 : Inscribed circle 12.70mm
3. Dimension limits for groove width and groove depth.
   (1) Max. groove width (w) : 4.8mm
   · Type ① and ④ w ≤ 4.8 (SumiTurn and B-Groove (BF Type): 4.5 mm)
   · Type ② : w + C_1 ≤ 4.8 (SumiTurn and B-Groove (BF Type): 4.5 mm)
   · Type ③ : w + S (or C_1) + C_2 ≤ 4.8 (SumiTurn and B-Groove (BF Type): 4.5 mm)
   (2) Min. groove width (w) · Insert size 3 : w ≥ 0.33mm
   · Insert size 4 : w ≥ 0.75mm
   (3) Depth (a_r) · Insert size 3 : a_r ≤ 0.8 to a_r ≤ 2.5mm (Internal grooving : a_r ≤ 0.8 to a_r ≤ 2.0)
   · Insert size 4 : a_r ≤ 2.0 to a_r ≤ 5.0mm (Internal grooving : a_r ≤ 2.0 to a_r ≤ 2.5)
4. SumiTurn B-Groove inserts with chipbreaker are limited to insert size 4 and the AC530U grade.
   For shape details,please contact us directly.
5. Standard tolerance for inserts.

Symbol	Standard Tolerance
w	±0.025mm
a_r	±0.05mm
θ°_1 、 θ°_2	±1°

Unless otherwise specified, inserts are made to standard tolerances.

6. Grades are based on the catalogue number in stock.
7. The applicable toolholders for Type ① , ② , and ④ should match dimension w. Contact us for Type ③ .