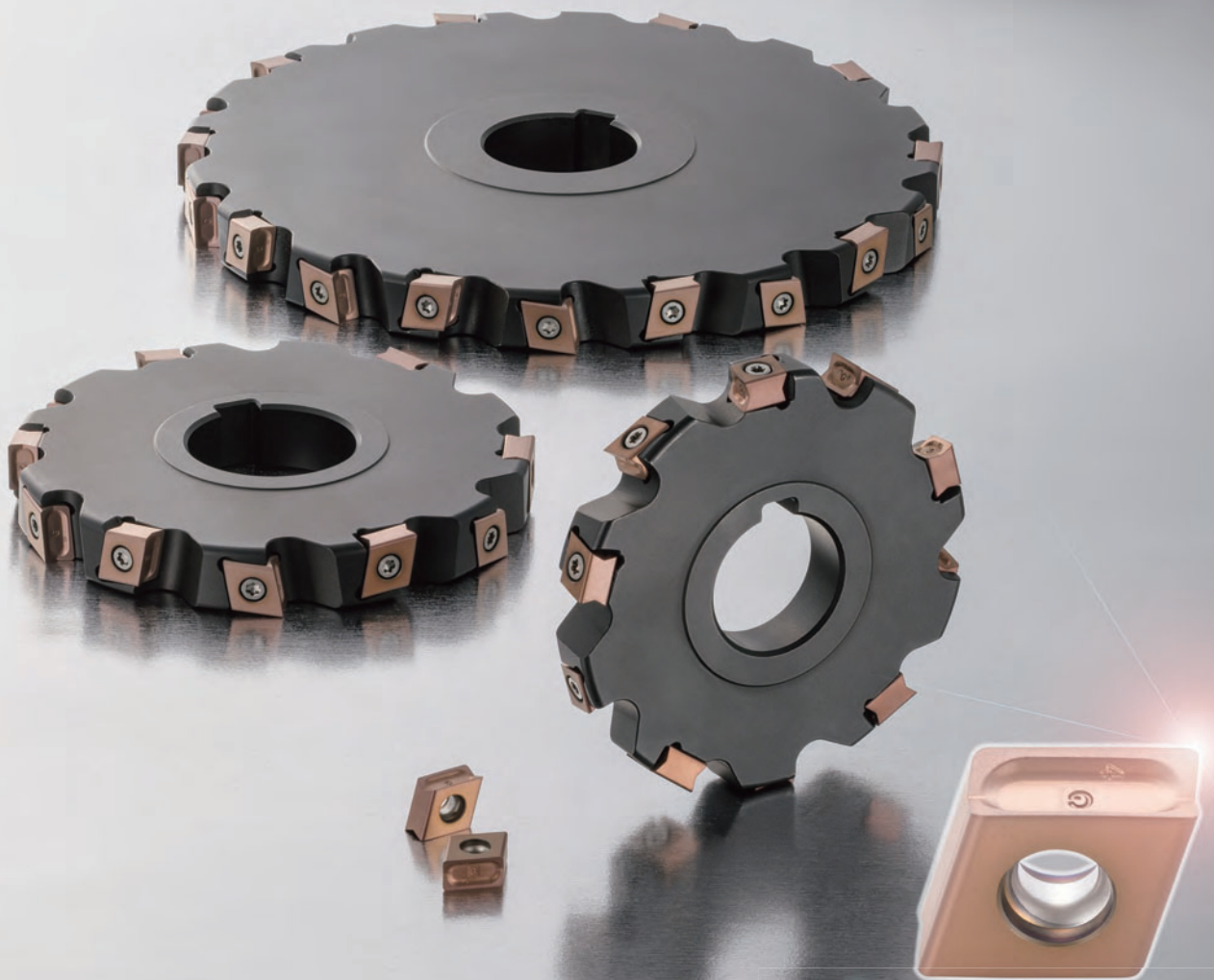


Low Resistance Tangential Insert Slotting Cutter

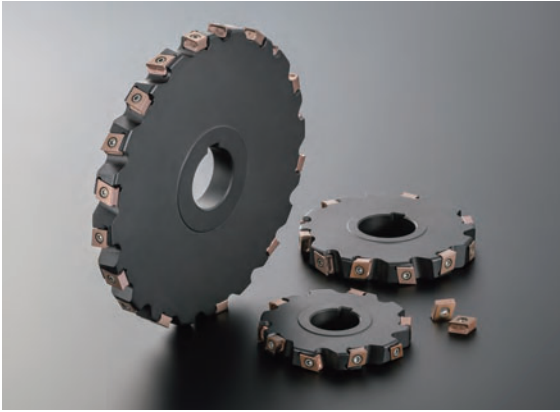
# SEC-Sumi Dual Mill **TGC** series

Side cutter with excellent cutting edge sharpness realizes low resistance and low vibration milling



**4**-Cornered  
Ground Type Insert

\* Product depicted is an image only.



### ■ Features

- Side Cutter Suitable For A Variety Of Applications  
Made-to-order bodies possible with cutting width of 17mm and up  
Suitable for various applications such as groove milling and shoulder milling
- Realises Low Resistance and Low Vibration Milling  
Design emphasizes cutting edge sharpness with +10° inclination angle  
Excellent cutting edge sharpness suppresses chatter to enable stable machining
- Excellent Machined Surface Quality  
Proprietary insert array design minimizes joint steps at the groove bottom for excellent machining quality
- Neutral-handed 4-cornered Insert  
Easy management with neutral-handed insert design that eliminates the need to align right-hand and left-hand inserts

### ■ Product Range (Body)

Body: Made-to-order (custom design)

Standard design



Multi-stepped design



Insert Cat. No.	Width of Cut CW (mm)						
	17	21	22	22.8	23.7	24.6	Over 24.6
<b>TGCX130704PNEN-G</b>	Standard design						Multi-stepped design
<b>TGCX130708PNEN-G</b>	Standard design					Multi-stepped design	
<b>TGCX130712PNEN-G</b>	Standard design				Multi-stepped design		
<b>TGCX130716PNEN-G</b>	Standard design			Multi-stepped design			
<b>TGCX130720PNEN-G</b>	Standard design		Multi-stepped design				

Standard design CW upper limit value varies with insert.

### ■ Product Range (Insert)

Cat. No.	Corner Radius RE (mm)				
	0.4	0.8	1.2	1.6	2.0
<b>TGCX1307○○PNEN-G</b>	●	●	●	●	●

● mark: Standard stocked item

### ■ Chipbreaker

Work Material	<b>P</b> Steel, <b>M</b> stainless steel, <b>K</b> cast iron
Applications	General-purpose to roughing
Chipbreaker	<b>G Type</b> TGCX 13
Cutting Edge Cross Section	

### ■ Suitable for Various Applications



Standard disc shape

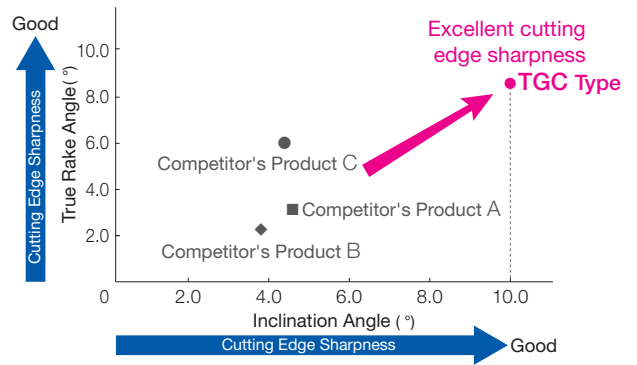
■ Sharp Edge Design

Design emphasizes cutting edge sharpness with +10° inclination angle. Excellent cutting edge sharpness suppresses chatter to enable stable machining.



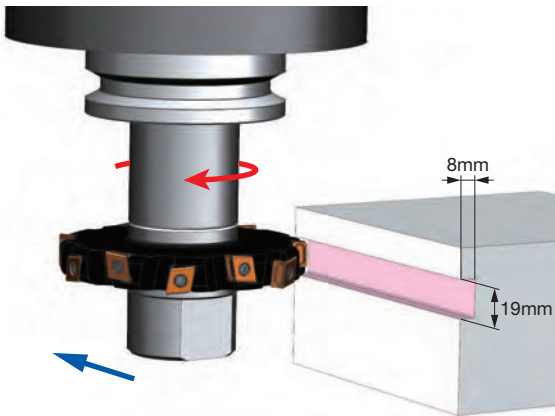
Inclination Angle

True Rake Angle

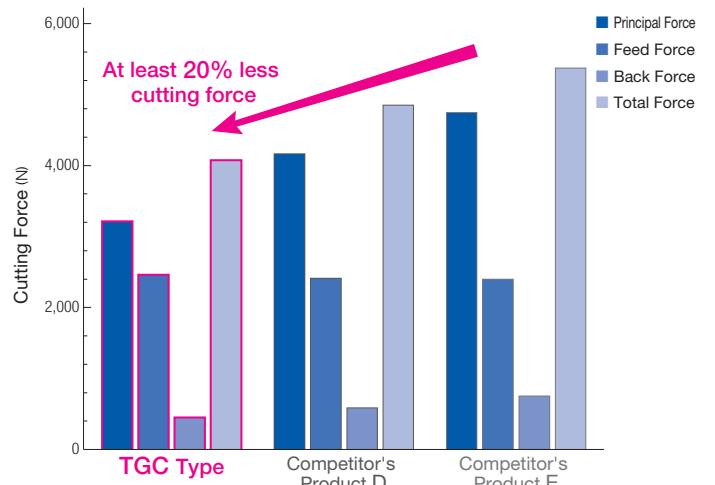


■ Cutting Performance

● Low Cutting Force

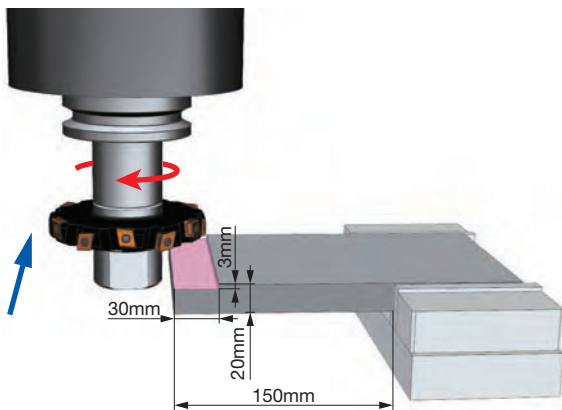


Machine: Vertical Machining Centre BT50, Work Material: S50C  
 Tool: TGC 13125W19Z12RS (ø125, Width of Cut 19mm, 12 teeth)  
 Insert: TGCX 130708PNEN-G (ACU2500)  
 Cutting Conditions:  $v_c=200\text{m/min}$   $f_z=0.2\text{mm/t}$   $a_p=19\text{mm}$   $a_e=8\text{mm}$   
 Down Cut Dry



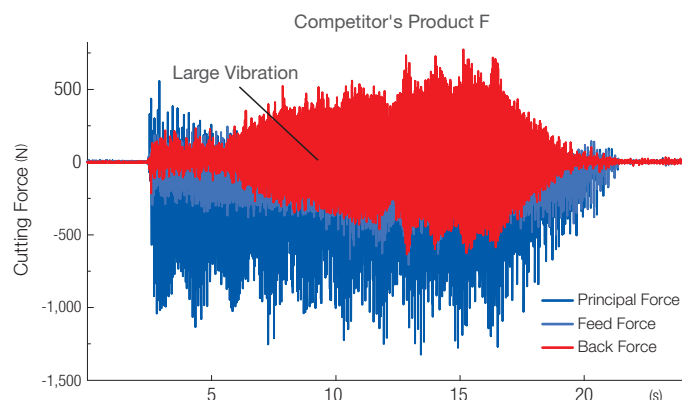
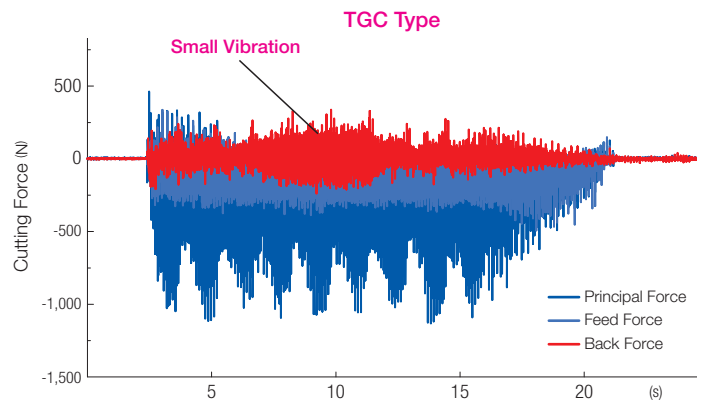
Excellent cutting edge sharpness eliminates chatter to enable stable machining

● Low Vibration



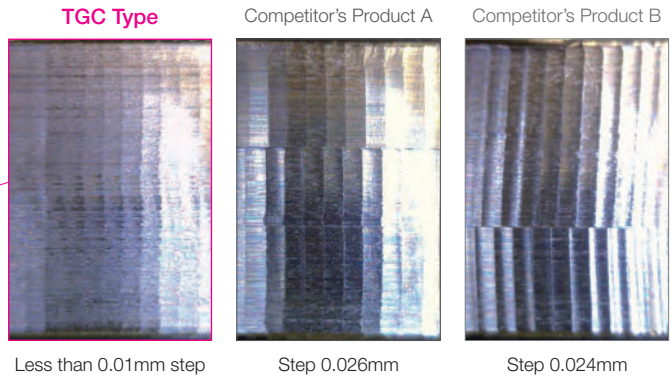
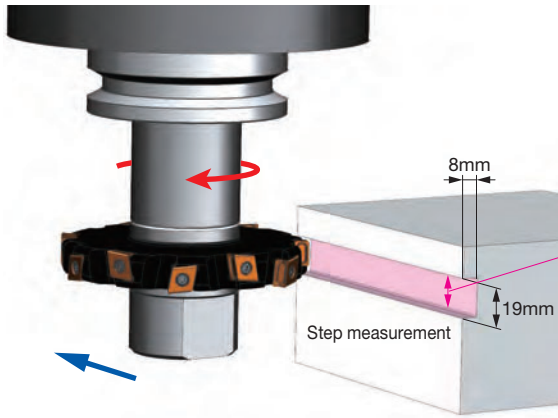
Machine: Vertical Machining Centre BT50, Work Material: FC250  
 Tool: TGC 13125W19Z12RS (ø125, Width of Cut 19mm, 12 teeth)  
 Insert: TGCX 130708PNEN-G (ACU2500)  
 Cutting Conditions:  $v_c=200\text{m/min}$   $f_z=0.2\text{mm/t}$   $a_p=3\text{mm}$   $a_e=30\text{mm}$   
 Down Cut Dry

Suppresses chatter even when machining low-rigidity workpieces



### ● Small Joint Steps At Groove Bottom

Proprietary insert array design minimizes joint steps at groove bottom for excellent visual quality



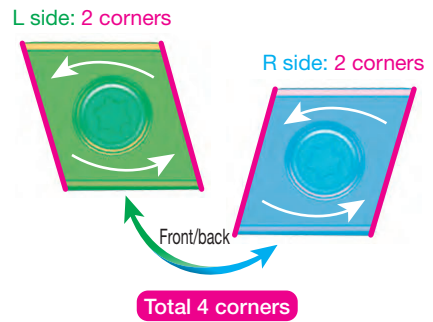
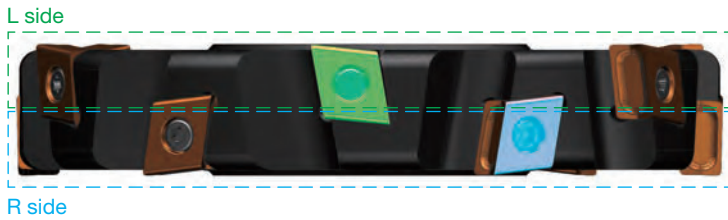
Machine: Vertical Machining Centre BT50, Work Material: S50C  
 Tool: TGC 13125W19Z12RS (φ125, Width of Cut 19mm, 12 teeth)  
 Insert: TGCX 130708PNEN-G (ACU2500)  
 Cutting Conditions:  $v_c=200\text{m/min}$   $f_z=0.2\text{mm/t}$   $a_p=19\text{mm}$   $a_e=8\text{mm}$   
 Down Cut Dry

### Excellent visual quality

\* Results of in-house evaluation.

### ● Neutral-handed 4-cornered Insert

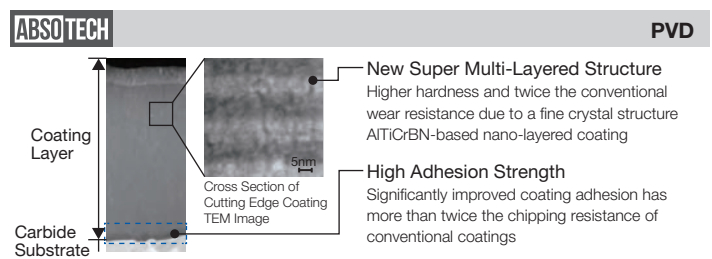
Easy management with neutral-handed insert design that eliminates the need to align right-hand and left-hand inserts



### ■ Grade Features

Work Material	Grade	Coating Thickness (μm)	Features
	ACU2500	3	Utilises ABSOTECH™ coating technology with excellent wear and chipping resistance. Its carbide substrate, with excellent fracture and wear resistance, achieves stable and long tool life for a variety of work materials.

### Coating Layer Features



### ■ Grade Application Range (TGC Type)

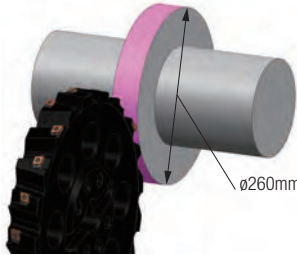
Work Material	Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
	ACU2500		
	ACU2500		
	ACU2500		

The letter "P" at the end of each grade indicates the coating type. ▲: PVD

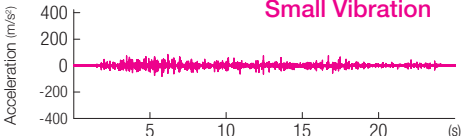
Application Examples

**Carbon Steel S55C Cam Shaft**

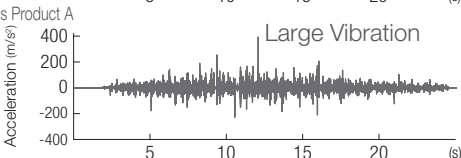
Horizontal NC Milling Machine  
**Stable machining enabled, average amplitude reduced by 50%**



**TGC Type**



**Competitor's Product A**



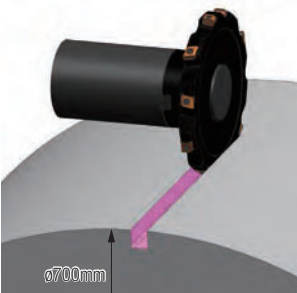
	Sumitomo	Competitor's Product
Insert	TGCX130708PNEN	Vertical Type 4 Corners
Grade	ACU2500	—
Chipbreaker	G	—
Cutter Dia./Width of Cut (mm)	* 350 / * 48	350 / 48
Number of Teeth	20	20
$v_c$ (m/min)	170	170
$v_f$ (mm/min)	32	32
$f_z$ (mm/t)	0.05	0.05
$a_p$ (mm)	42	42
$a_e$ (mm)	20 to 40	20 to 40
Coolant	Wet	Wet

Results: Excellent cutting edge sharpness drastically suppresses vibration and machining noise. Stable machining enabled without cutting edge fracture

\* Non-standard design product

**Alloy Steel SNCM Rotor Shaft**

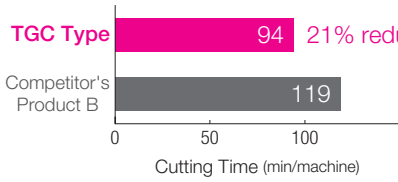
Horizontal Boring Machine BT50



**Machining time reduced by 21% compared to competitor's product (lay-flat insert)**

**TGC Type** 94 21% reduced

**Competitor's Product B** 119



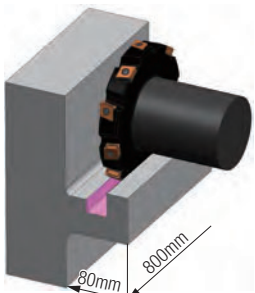
	Sumitomo	Competitor's Product
Insert	* TGCX13-G	Single-Sided, 2 Corners
Grade	ACU2500	—
Chipbreaker	G	—
Cutter Dia./Width of Cut (mm)	* 170 / 18	170 / 16
Number of Teeth	10	10
$v_c$ (m/min)	100 to 200	70 to 200
$v_f$ (mm/min)	up to 370	up to 370
$f_z$ (mm/t)	up to 0.2	up to 0.2
$a_p$ (mm)	18	18
$a_e$ (mm)	15.5	15.5
Coolant	Dry	Dry

Results: Improved cutting conditions reduce total machining time. Tangential insert design with high cutting edge strength eliminates cutting edge fracture.

\* Non-standard design product

**Cast Iron FC300 Machine Component**

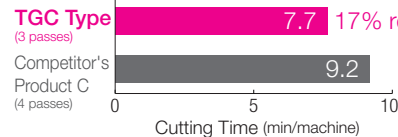
Horizontal Machining Centre BT50




**Number of machining passes can be reduced**

**TGC Type** (3 passes) 7.7 17% reduced

**Competitor's Product C** (4 passes) 9.2



**Tool life over 2 times longer without cutting edge fracture**

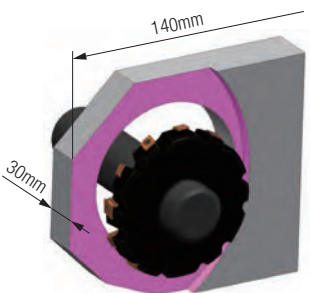


	Sumitomo	Competitor's Product
Insert	TGCX130708PNEN	Vertical Type 4 Corners
Grade	ACU2500	—
Chipbreaker	G	—
Cutter Dia./Width of Cut (mm)	125 / 20	125 / 16
Number of Teeth	10	10
$v_c$ (m/min)	160	160
$v_f$ (mm/min)	300	300
$f_z$ (mm/t)	0.15	0.15
$a_p$ (mm)	10 to 20	3 to 16
$a_e$ (mm)	10 to 25	up to 25
Coolant	Dry	Dry

Results: Reduced machining passes shorten machining time. Low machining noise and good machined surface quality


**Cast Iron FC300 Equivalent Cylinder Block**

Horizontal Machining Centre HSK-A100



**Vertical Orientation** Back: 2 corners

**Horizontal Orientation** Front: 2 corners



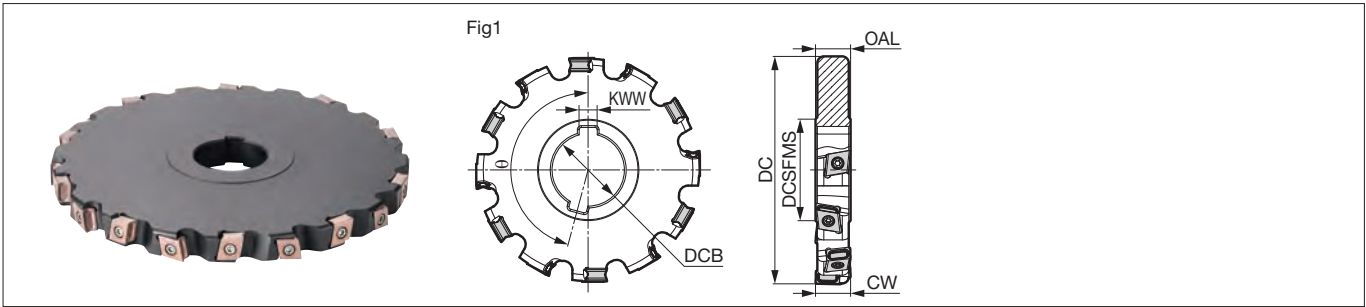
**Machining possible even with twice the number of teeth than competitor's products, inserts are arranged both vertically and horizontally to use all 4 corners**

	Sumitomo	Competitor's Product
Insert	TGCX130708PNEN	Vertical Type 4 Corners
Grade	ACU2500	—
Chipbreaker	G	—
Cutter Dia. (mm)	* 136	136
Number of Teeth	12	6
$v_c$ (m/min)	120	120
$v_f$ (mm/min)	340	340
$f_z$ (mm/t)	0.1	0.2
$a_p$ (mm)	5	5
$a_e$ (mm)	up to 35	up to 35
Coolant	Remainder Wet	Remainder Wet

Results: Low clamp rigidity, enabling machining with twice the number of teeth even in chatter-prone machining. Efficiency can be even further improved

\* Non-standard design product

Rake Angle	Radial	-11.5° to -9.5°	17 to 24.6 90°
	Axial	10°	



■ Body (Standard Disc Shape)

Cat. No.		Stock	DC	DCSFMS	Width of Cut CW	Boss Thickness OAL	Bore Dia. DCB	Keyway Width KWW	Phase $\theta$ (°)	Total No. of Teeth	Weight (kg)	Fig
Metric	<b>TGC 13100W</b> ○○ <b>Z10RS</b>		100	47	17 to 24.6	=CW	32	8	162	10	0.66 up	1
	<b>13125W</b> ○○ <b>Z12RS</b>		125	55	17 to 24.6	=CW	40	10	165	12	1.29 up	1
	<b>13160W</b> ○○ <b>Z14RS</b>		160	55	17 to 24.6	=CW	40	10	167.14	14	2.04 up	1
	<b>13200W</b> ○○ <b>Z16RS</b>		200	69	17 to 24.6	=CW	50	12	168.75	16	3.33 up	1

Basic specifications have two keyways. (Also available with only one) Inserts are sold separately.  
 The upper limit of width of cut CW is the value of inserts with corner radius RE0.4. For the width of cut CW upper limit values for each corner radius RE, see the Insert Cat. No. Table.  
 Disc shapes other than the standard type can be designed.

■ Identification Code

**TGC 13 125 W17 Z12 R S**  
 Series    Insert Size    Dia.    Width of Cut    Number of Teeth    Feed Direction    Metric Bore

■ Parts

Flat Insert Screw	Wrench	Anti-seizure Cream
BFTX0412IP	3.0	TRDR15IP SUMI-P

■ Insert

Grade Classification	Coated Carbide			
Process	High-speed/Light Cutting			
	Medium Cutting			
	Roughing			
Cat. No.	ACU2500	Corner Radius RE	Width of Cut CW Upper Limit	Fig
<b>TGCX 130704PNEN-G</b>	●	0.4	24.6	1
<b>130708PNEN-G</b>	●	0.8	23.7	1
<b>130712PNEN-G</b>	●	1.2	22.8	1
<b>130716PNEN-G</b>	●	1.6	22.0	1
<b>130720PNEN-G</b>	●	2.0	21.0	1

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed $v_c$ (m/min) Min. - Optimum - Max.	Feed Rate $f_z$ (mm/t) Min. - Optimum - Max.	Insert Grade
P	Carbon Steel	180 to 280 HB	G	100 - <b>200</b> - 300	0.1 - <b>0.2</b> - 0.25	ACU2500
	Alloy Steel	180 to 280 HB	G	80 - <b>160</b> - 260	0.1 - <b>0.2</b> - 0.25	ACU2500
M	Stainless Steel	180 to 280 HB	G	90 - <b>135</b> - 180	0.1 - <b>0.15</b> - 0.2	ACU2500
K	Cast Iron/Ductile Cast Iron	250HB	G	100 - <b>200</b> - 300	0.1 - <b>0.2</b> - 0.25	ACU2500

Note - The above figures are guidelines for simultaneous cutting with one R/L cutting flute each, on a BT50 machine tool.  
 - The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

## SEC-Sumi Dual Mill TGC Type Made-To-Order Request Sheet

Select a cutter design and enter the dimensions in .

After completion, send the sheet to our nearest sales office or distributor.

Feel free to contact us for other shapes or dimensions or with other requests.

Company Name/Contact

### Insert Series Configuration

Dimensions (mm)

Cat. No.	Corner Radius RE				
	0.4	0.8	1.2	1.6	2.0
TGCX 1307〇〇PNEN-G	●	●	●	●	●
TGCX 13 Width of Cut CW Upper Limit Value	24.6	23.7	22.8	22.0	21.0

A multi-stepped design is required if the width of cut CW is wider than these upper limit values.




● mark: Standard stocked item

### Width of Cut CW Size Reference Specification

Width of Cut CW	Insert Type
17 to 24.6mm	TGCX 13

- The above width of cut CW upper limit value is the value with insert corner radius RE0.4.
- For the width of cut CW upper limit values for each corner radius RE, see the Insert Series Configuration Table on the left.

### Accessories

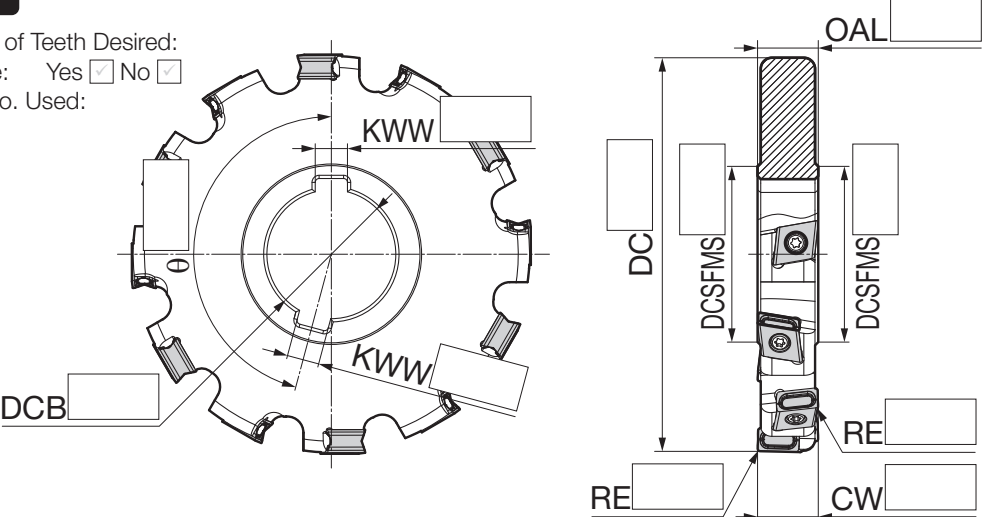
Flat Insert Screw	Wrench	Anti-seizure Cream
		

**Disc**

Effective No. of Teeth Desired:

Coolant Hole: Yes  No

Arbor Cat. No. Used:



Basic specifications have two keyways. (Also available with only one)

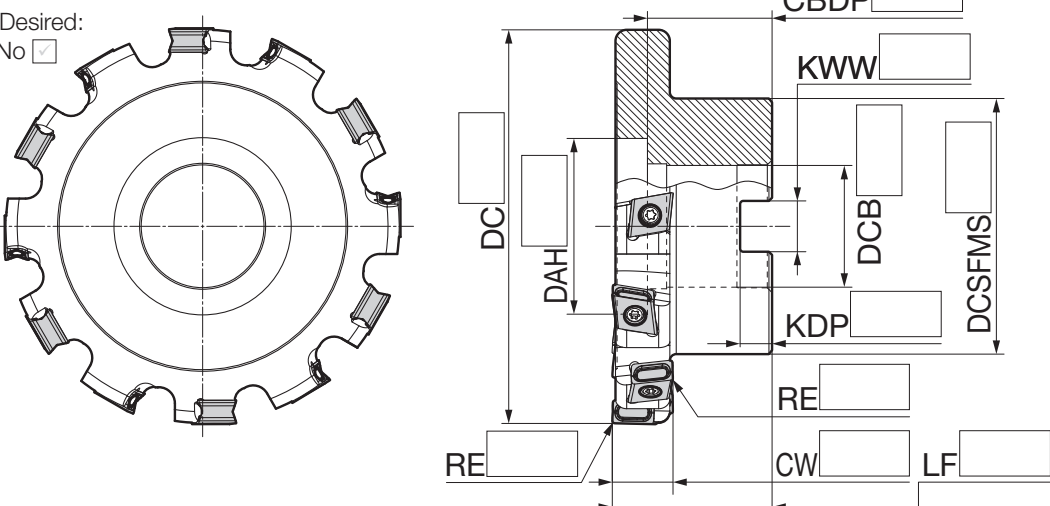
**With Boss**

Effective No. of Teeth Desired:

Coolant Hole: Yes  No

Arbor Cat. No. Used:

Feed Direction:  
 Right-handed   
 Left-handed   
 (Figure shows right-handed)



Designs for applications other than those listed above are possible, please consult us separately.

Sumitomo Electric Cutting Tools Official Apps for iOS/Android



Cutting calculation App

## SumiTool Calculator



Grade & chipbreaker comparison App

## SumiTool Converter



### < SAFETY NOTES >



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

 Sumitomo Electric Industries, Ltd.

Hardmetal Division

Global Marketing Department : 1-1-1, Koyakita, Itami, Hyogo 664-0016, Japan

<https://www.sumitool.com/global>