

**G-Class Positive
3D Chipbreaker Series for Swiss Lathe**

SI ^{Expansion} type / **FF** ^{New} type / **SL** ^{New} type Chipbreaker

Chipbreaker series that handles a wide range of needs in small products machining



Expansion 1st Recommendation for Small Product Machining

SI type Expanded

New For Fine Finishing

New FF type

New Sharper Cutting Edge

New SL type



SumiSm^oll

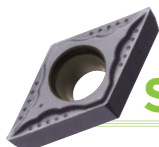
SI type/FF type/SL type Chipbreaker



■ Features

New expanded lineup of chipbreaker series for high-accuracy small product machining of steel, stainless steel, and exotic alloys, supporting various turning needs

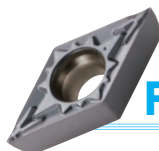
- Expanded SI type items, well received for their stable high chip evacuation performance
- FF type now available as a series, focusing on reliable chip control in fine cutting
- SL type now available as a series, with excellent cutting edge sharpness in light to medium cutting



SI type

Expansion

1st recommendation for small product machining. Excellent chip evacuation performance over a wide range of cutting conditions



FF type

New

Outstanding chip control in fine finishing

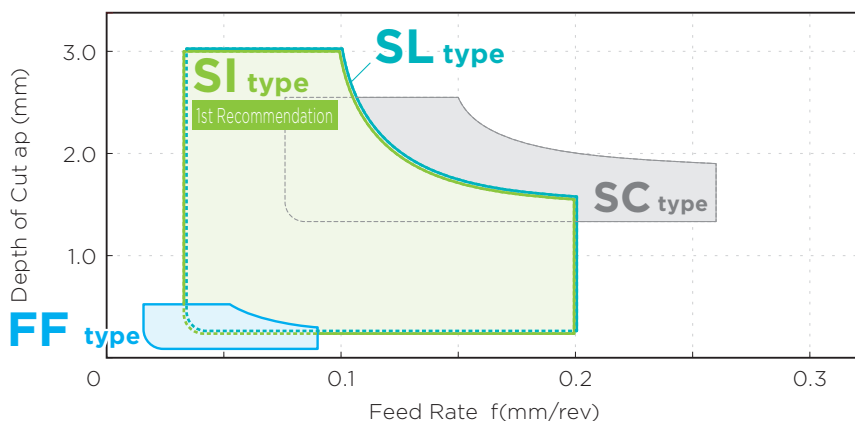


SL type

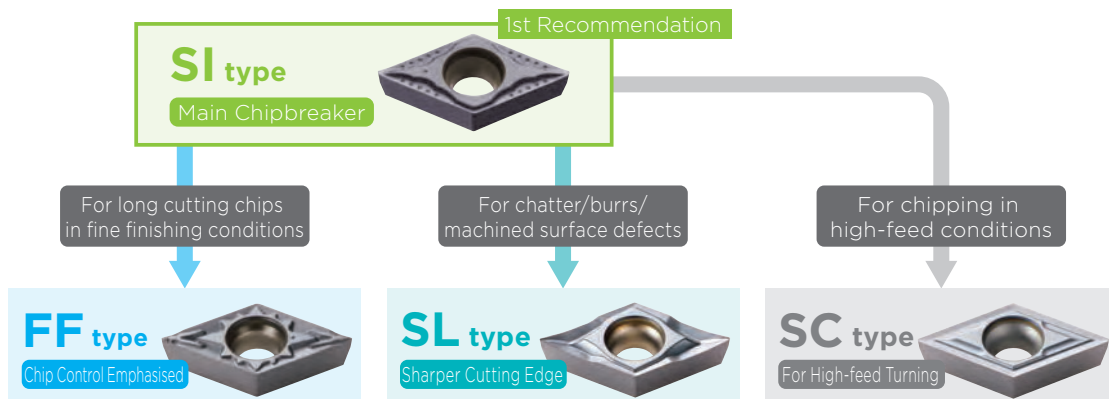
New

Exhibits excellent cutting edge sharpness over a wide range of cutting conditions. Emphasis on high machined surface quality

■ Chipbreaker Application Range

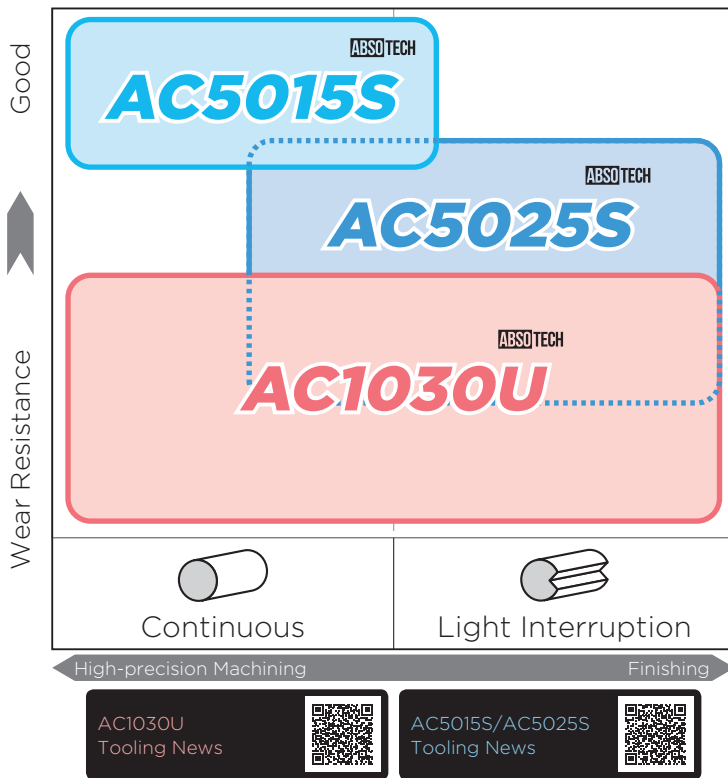


■ Selecting Chipbreakers



SI type/FF type/SL type Chipbreaker

Grade Application Range (Recommended Grades for Small Product Machining)



AC1030U ABSOTECH

1st recommendation for small product machining
High-quality cutting edge realises excellent machined surface quality
Supports various work materials such as steel, stainless steel, and exotic alloys

P M K N S H

AC5015S ABSOTECH

A grade with high wear resistance that can maintain the dimensional accuracy of the workpiece for a long period
Ideal for continuous turning of exotic alloys or precipitation-hardened stainless steel

P M K N S H

AC5025S ABSOTECH

A grade with an excellent balance of wear and fracture resistance
Ideal for machining of exotic alloys, including interrupted areas

P M K N S H

Grade Application Range (Small Product Machining)

Work Material		High-precision	Finishing/Light Cutting	Medium Cutting
P Steel	Coated Carbide	AC1030U		
		AC5015S		
		AC5025S		
	Cermet	T1000A	T1500A T1500Z	T2500Z
M Stainless Steel	Coated Carbide	AC1030U		
		AC5015S		
		AC5025S		
		AC530U		AC630M
	Cermet	T1000A	T1500A T1500Z	

Work Material		High-precision	Finishing/Light Cutting	Medium Cutting
S Exotic Alloy	Coated Carbide	AC1030U		
		AC5015S		
		AC5025S		
		AC510U		
		AC520U		

: 1st Recommended Grade
 : 2nd Recommended Grade
 : CVD
 : PVD
 Blank: Uncoated

SI type/FF type/SL type Chipbreaker

VIDEO OF CUTTING



The SI type chipbreaker is the 1st recommendation for small product machining

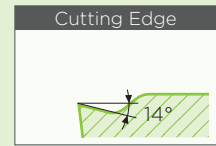
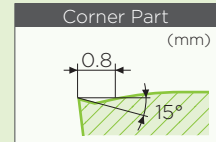
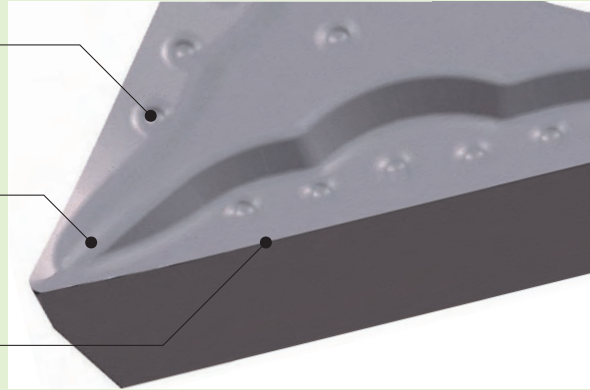
Realises excellent chip evacuation and wear resistance over a wide range of cutting conditions for outstanding versatility



Dimpled shape suppresses heat generation due to large depths of cut

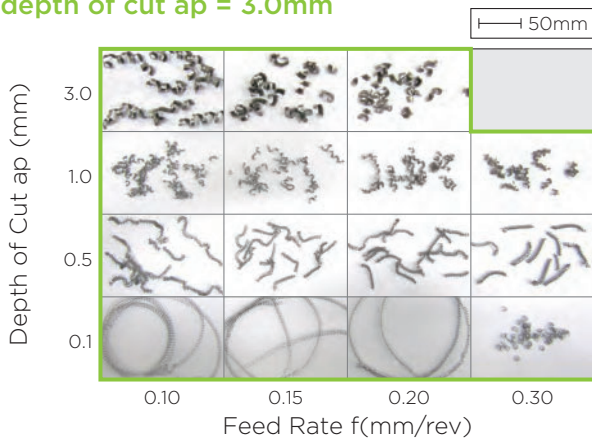
Protrusion breaks chips over a wide range of depths of cut

Cutting edge shape aimed at improving chip control performance and reduce cutting force in profiling



SI type Chip Evacuation Performance (Stainless Steel) **M**

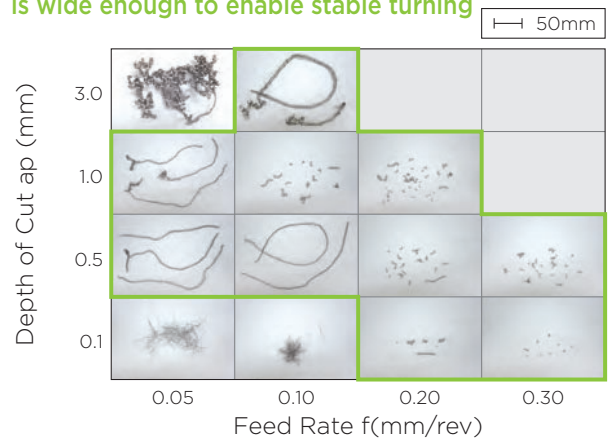
Excellent chip evacuation up to depth of cut $a_p = 3.0\text{mm}$



Work Material: SUS316 Insert: DCGT11T304MN-SI (AC520U)
Cutting Conditions: $vc = 100\text{m/min}$, $f = 0.1$ to 0.3mm/rev , $a_p = 0.1$ to 3.0mm , Wet

SI type Chip Evacuation Performance (Titanium Alloy) **S**

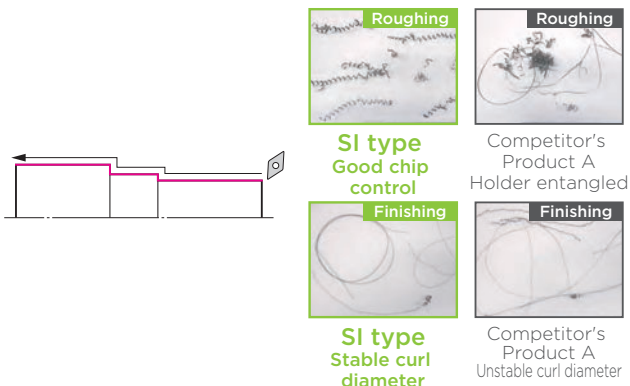
In titanium alloys as well, the range of chip control is wide enough to enable stable turning



Work Material: Ti-6Al-4V Insert: DCGT11T304MN-SI (AC520U)
Cutting Conditions: $vc = 100\text{m/min}$, $f = 0.05$ to 0.30mm/rev , $a_p = 0.1$ to 3.0mm , Wet

SI type Chip Evacuation Performance (Roughing, Finishing) **P**

Chip curl diameter is stable in both roughing and finishing; chip control is good, eliminating chip issues



Work Material: S45C
Insert: [Roughing] DCGT11T304MN-SI / [Finishing] DCGT11T302MN-SI (AC520U)
Cutting Conditions: [Roughing] $vc = 200\text{m/min}$, $f = 0.08$ to 0.15mm/rev , $a_p = 0.80$ to 1.50mm , Wet
[Finishing] $vc = 250\text{m/min}$, $f = 0.05$ to 0.07mm/rev , $a_p = 0.05\text{mm}$, Wet



SI type/FF type/SL type Chipbreaker



The FF type chipbreaker exhibits outstanding chip control in fine finishing
 Stable chip control is possible even in turning with variable depths of cut



FF type

Centre protrusion with excellent chip control at depths of cut $a_p = 0.1\text{mm}$ or below

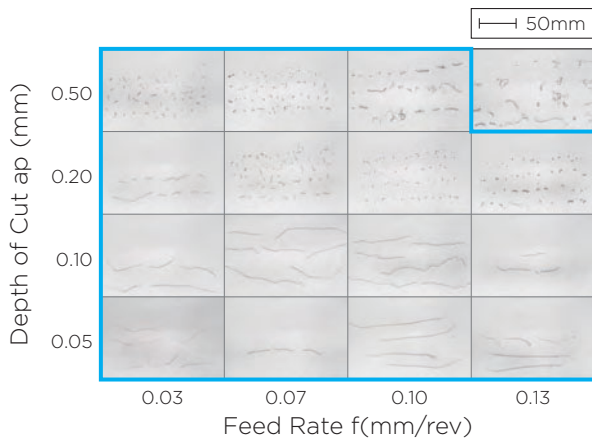
Wavy cutting edge and chip pocket design prevent chips from overflowing the breaker wall, controlling chips during variable turning

Corner Part (mm)

Cutting Edge

FF type Chip Evacuation Performance (Steel) P

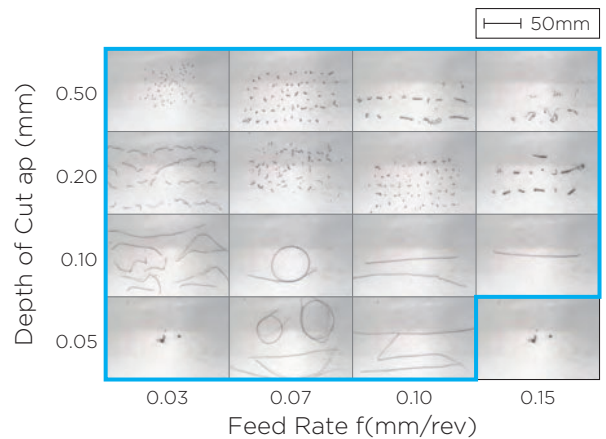
Excellent chip breaking performance at depth of cut $a_p = 0.5\text{mm}$ and below



Work Material: SCM415 $\phi 30\text{mm}$ External Turning, Insert: DCGT11T302MN-FF (AC1030U)
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.03$ to 0.13mm/rev , $a_p = 0.05$ to 0.50mm , Wet

FF type Chip Evacuation Performance (Stainless Steel) M

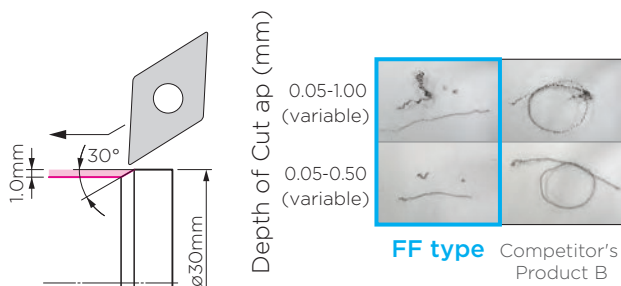
Excellent chip control in fine finishing of stainless steel as well



Work Material: SUS316 $\phi 30\text{mm}$ External Turning, Insert: DCGT11T302MN-FF (AC1030U)
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.03$ to 0.15mm/rev , $a_p = 0.05$ to 0.50mm , Wet

FF type Chip Evacuation Performance (Variable Depths of Cut) M

Controls chips even in turning with variable depths of cut



Work Material: SUS316 $\phi 30\text{mm}$ Taper 30° Turning, Insert: DCGT11T302MN-FF (AC1030U)
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.07\text{mm/rev}$
 $a_p = 0.05$ to 1.00mm (variable), 0.05 to 0.50mm (variable), Wet



SI type/FF type/SL type Chipbreaker

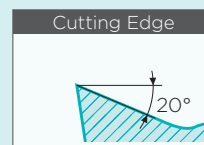
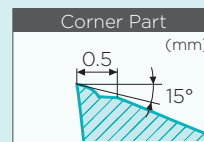
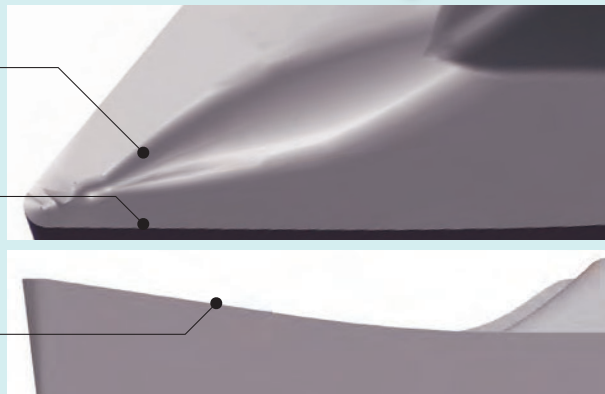
With excellent cutting edge sharpness, the SL type chipbreaker suppresses the burrs, chatter, and machined surface defects to which small product machining is prone. Ideal for higher-quality turning in a wide range of cutting conditions.



Protrusion suppresses cutting force at large depths of cut while controlling chips at small depths of cut

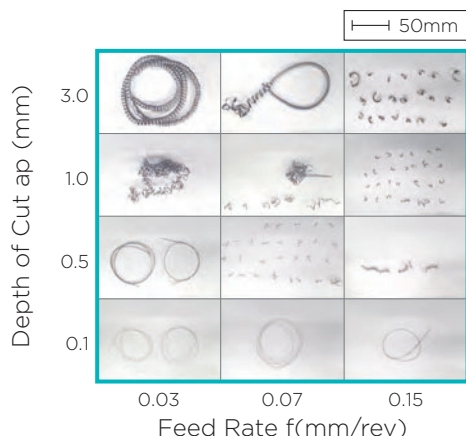
Sharp rake shape

Slanted cutting edge realises smooth engagement and exhibits good cutting performance even in vibratory cutting



SL type Chip Evacuation Performance P

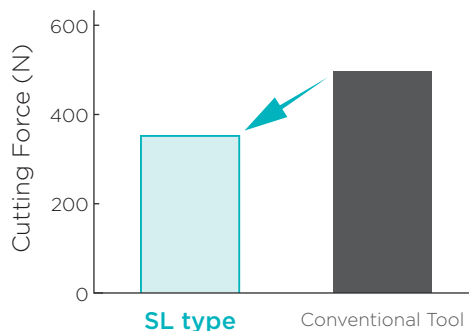
Good chip curls over a wide range of cutting conditions



Work Material: SCM415 ϕ 22mm External Turning, Insert: DCGT11T302MN-SL (ACI030U)
Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.03$ to 0.15mm/rev , $a_p = 0.1$ to 3.0mm , Wet (Oil-based)

SL type Cutting Force M

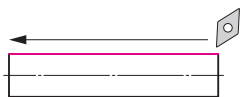
Cutting force 30% reduced compared to conventional tools (general-purpose chipbreakers)



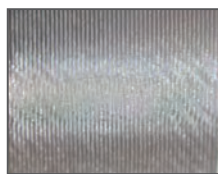
Work Material: SUS316 ϕ 30mm Insert: DCGT11T302MN-SL (ACI030U)
Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.07\text{mm/rev}$, $a_p = 2.0\text{mm}$ Wet (Oil-based)

SL type Chatter Resistance (External Turning) M

Excellent cutting edge sharpness suppresses chatter



SL type
No chatter

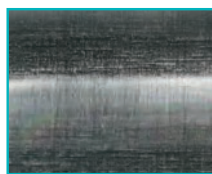
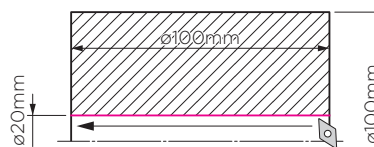


Competitor's Product A
Chatter

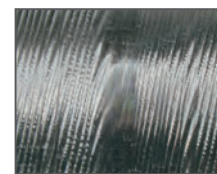
Work Material: SUS316 ϕ 22mm External Turning, Insert: DCGT11T302MN-SL (ACI030U)
Tool Overhang: 30mm
Cutting Conditions: $v_c = 50\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 1.5\text{mm}$ Wet (Oil-based)

SL type Chatter Resistance (Internal Boring) P

Excellent chatter resistance even in internal boring, which is prone to chatter due to long overhang



SL type
No chatter



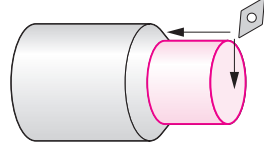

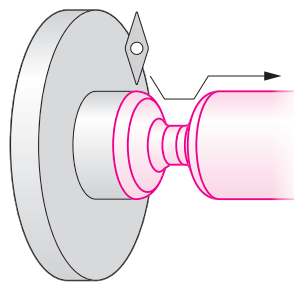
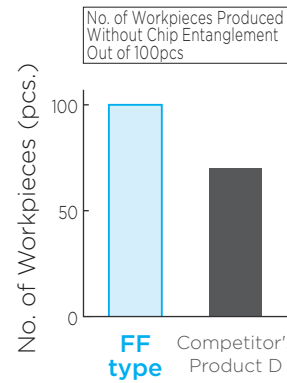
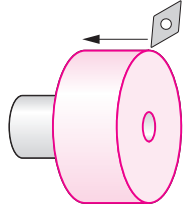
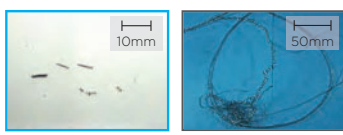
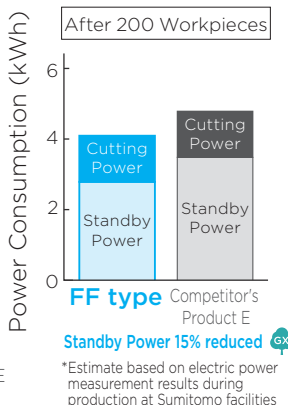
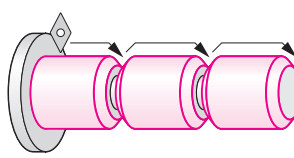
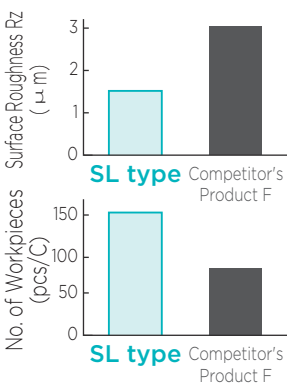



Competitor's Product B
Chatter

Work Material: SCM415 ϕ 20mm Internal Boring, Insert: DCGT070202MN-SL (ACI030U)
Holder: A16Q-SDQC R0702-20 Tool Overhang: 4.5D
Cutting Conditions: $v_c = 200\text{m/min}$, $f = 0.05\text{mm/rev}$, $a_p = 0.5\text{mm}$ Wet

SI type/FF type/SL type Chipbreaker

















Application Examples

<p>Inconel 718 Machine Component External Turning SI type S</p> <p>1.5 times the tool life, along with improved chip control</p>   <p>Tool: DCGT11T302MN-SI(AC510U) Cutting Conditions: $vc=35\text{m/min}$, $f=0.08\text{mm/rev}$, $ap=0.80\text{mm}$ Wet</p>	<p>SUS304 Shaft Part External Facing SI type M</p> <p>Chip control improved and cutting edge adhesion suppressed, eliminating sudden fractures for a long and stable tool life</p>   <p>Tool: DCGT11T304MN-SI(AC520U) Cutting Conditions: $vc=100\text{m/min}$, $f=0.08\text{mm/rev}$, $ap=0.50\text{mm}$ Wet</p>
<p>Steel for Mechanical Structures Header Part External Turning FF type P</p> <p>Increased productivity through improved chip control</p>   <p>Tool: VCGT110302MN-FF(AC1030U) Cutting Conditions: $vc=60\text{m/min}$, $f=0.03$ to 0.05mm/rev, $ap=0.10\text{mm}$ Wet (Oil-based)</p>	<p>SCM415 Valve Part External Turning FF type P</p> <p>Drastically improved chip control, productivity 20% improved</p>    <p>Tool: DCGT11T302MN-FF(AC1030U) Cutting Conditions: $vc=80\text{m/min}$, $f=0.050\text{mm/rev}$, $ap=0.075\text{mm}$ Wet (Oil-based)</p>
<p>SUS431 Valve Part External Turning SL type M</p> <p>Excellent cutting edge sharpness suppresses wear for 1.8 times longer tool life Machined surface roughness was less than 50% of competitor's</p>   <p>Tool: DCGT070202MN-SL(AC5025S) Cutting Conditions: $vc=270\text{m/min}$, $f=0.04\text{mm/rev}$, $ap=0.25\text{mm}$ Wet (Oil-based)</p>	<p>S45C Sleeve Part Outward Facing SL type P</p> <p>Excellent, stable machined surface quality</p>  <p>Tool: DCGT11T302MN-SL(AC5025S) Cutting Conditions: $vc=90\text{m/min}$, $f=0.05\text{mm/rev}$, $ap=0.10\text{mm}$ Wet (Oil-based)</p>









SI type/FF type/SL type Chipbreaker

SI type Chipbreaker Stock Table





( Coated Carbide /  Cermet)

Shape	Relief Angle	Cat. No.	Stock											Dimensions (mm)			
			AC630M	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	T1500Z	T2500Z	T1000A	T1500A	Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	7°	CCGT 060201MN-SI 		●	●				●					6.35	2.38	2.8	<0.1
		060202MN-SI 		●	●				●								<0.2
		060204MN-SI 		●	●				●								<0.4
		CCGT 09T301MN-SI	●	●	●	●	●	●	●	●	●	●	●	9.525	3.97	4.4	<0.1
		09T302MN-SI	●	●	●	●	●	●	●	●	●	●	<0.2				
		09T304MN-SI	●	●	●	●	●	●	●	●	●	●	<0.4				
	7°	DCGT 070201MN-SI	●	●	●	●	●	●	●	●	●	●	6.35	2.38	2.8	<0.1	
		070202MN-SI	●	●	●	●	●	●	●	●	●	<0.2					
		070204MN-SI	●	●	●	●	●	●	●	●	●	<0.4					
		DCGT 11T301MN-SI	●	●	●	●	●	●	●	●	●	●	9.525	3.97	4.4	<0.1	
		11T302MN-SI	●	●	●	●	●	●	●	●	●	<0.2					
		11T304MN-SI	●	●	●	●	●	●	●	●	●	<0.4					
	7°	TCGT 110201MN-SI 		●	●				●					6.35	2.38	2.8	<0.1
		110202MN-SI 		●	●				●								<0.2
		110204MN-SI	●	●	●	●	●	●	●	●	●	●	<0.4				
	11°	TPGT 080201MN-SI 		●	●				●					4.76	2.38	2.4	<0.1
		080202MN-SI 		●	●				●								<0.2
		080204MN-SI	●	●	●	●	●	●	●	●	●	●	<0.4				
	5°	VBGT 110301MN-SI		●	●	●	●	●	●	●	●	●	6.35	3.18	2.8	<0.1	
		110302MN-SI		●	●	●	●	●	●	●	●	<0.2					
		110304MN-SI		●	●	●	●	●	●	●	●	<0.4					
		110308MN-SI		●	●	●	●	●	●	●	●	<0.8					
		VBGT 160401MN-SI		●	●	●	●	●	●	●	●	●	9.525	4.76	4.4	<0.1	
		160402MN-SI		●	●	●	●	●	●	●	●	<0.2					
		160404MN-SI		●	●	●	●	●	●	●	●	<0.4					
		160408MN-SI		●	●	●	●	●	●	●	●	<0.8					
	7°	VCGT 110301MN-SI	●	●	●	●	●	●	●	●	●	●	6.35	3.18	2.8	<0.1	
		110302MN-SI	●	●	●	●	●	●	●	●	●	<0.2					
		110304MN-SI	●	●	●	●	●	●	●	●	●	<0.4					
		110308MN-SI	●	●	●	●	●	●	●	●	●	<0.8					
		VCGT 160401MN-SI	●	●	●	●	●	●	●	●	●	●	9.525	4.76	4.4	<0.1	
		160402MN-SI	●	●	●	●	●	●	●	●	●	<0.2					
		160404MN-SI	●	●	●	●	●	●	●	●	●	<0.4					
		160408MN-SI	●	●	●	●	●	●	●	●	●	<0.8					
	11°	VPGT 110301MN-SI 		●	●				●					6.35	3.18	2.8	<0.1
		110302MN-SI 		●	●				●								<0.2

FF type Chipbreaker Stock Table

Shape	Relief Angle	Cat. No.	Stock			Dimensions (mm)			
			AC5015S	AC5025S	AC1030U	Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	7°	CCGT 060201MN-FF	●	●	●	6.35	2.38	2.8	<0.1
		060202MN-FF	●	●	●				<0.2
		060204MN-FF	●	●	●				<0.4
	7°	CCGT 09T301MN-FF	●	●	●	9.525	3.97	4.4	<0.1
		09T302MN-FF	●	●	●				<0.2
		09T304MN-FF	●	●	●				<0.4
	7°	DCGT 070201MN-FF	●	●	●	6.35	2.38	2.8	<0.1
		070202MN-FF	●	●	●				<0.2
		070204MN-FF	●	●	●				<0.4
	7°	DCGT 11T301MN-FF	●	●	●	9.525	3.97	4.4	<0.1
		11T302MN-FF	●	●	●				<0.2
		11T304MN-FF	●	●	●				<0.4
	7°	TCGT 110201MN-FF	●	●	●	6.35	2.38	2.8	<0.1
		110202MN-FF	●	●	●				<0.2
		110204MN-FF	●	●	●				<0.4
	11°	TPGT 080201MN-FF	●	●	●	4.76	2.38	2.4	<0.1
		080202MN-FF	●	●	●				<0.2
		080204MN-FF	●	●	●				<0.4
	7°	VCGT 110301MN-FF	●	●	●	6.35	3.18	2.8	<0.1
		110302MN-FF	●	●	●				<0.2
		110304MN-FF	●	●	●				<0.4
	11°	VPGT 110301MN-FF	●	●	●	6.35	3.18	2.8	<0.1
		110302MN-FF	●	●	●				<0.2

SL type Chipbreaker Stock Table

Shape	Relief Angle	Cat. No.	Stock			Dimensions (mm)						
			AC5015S	AC5025S	AC1030U	Inscribed Circle	Thickness	Hole Dia.	Corner Radius			
	7°	CCGT 060201MN-SL	●	●	●	6.35	2.38	2.8	<0.1			
		060202MN-SL	●	●	●				<0.2			
		CCGT 09T301MN-SL	●	●	●				9.525	3.97	4.4	<0.1
		09T302MN-SL	●	●	●							<0.2
	7°	DCGT 070201MN-SL	●	●	●	6.35	2.38	2.8	<0.1			
		070202MN-SL	●	●	●				<0.2			
		DCGT 11T301MN-SL	●	●	●				9.525	3.97	4.4	<0.1
		11T302MN-SL	●	●	●							<0.2
	7°	DCGT 11T304MN-SL	●	●	●	9.525	3.97	4.4	<0.4			
		11T304MN-SL	●	●	●				<0.4			
	7°	VCGT 110301MN-SL	●	●	●	6.35	3.18	2.8	<0.1			
		110302MN-SL	●	●	●				<0.2			
		110304MN-SL	●	●	●				<0.4			

All inserts with SI, FF, and SL type chipbreakers are produced with negative corner radius tolerance, specified finished corner radius can also be produced for various workpieces. (conventional inserts have ± tolerance)

Note: Cat. Nos. for inserts with negative tolerance corner radius differ from those of normal inserts.

Example: **DCGT 11T304 M N-SI**

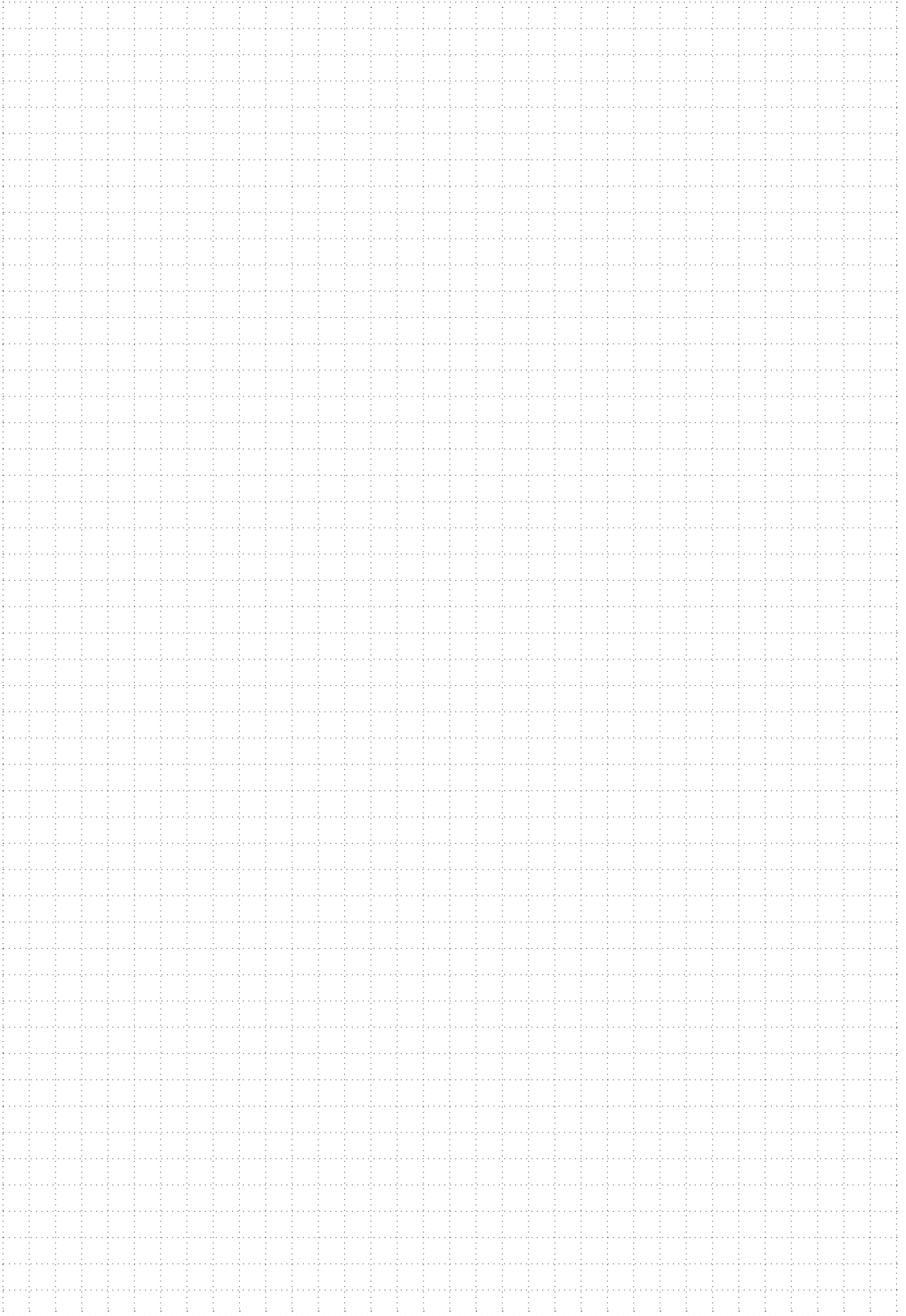
Negative tolerance symbol

A "<" next to the corner radius RE indicates a negative tolerance.

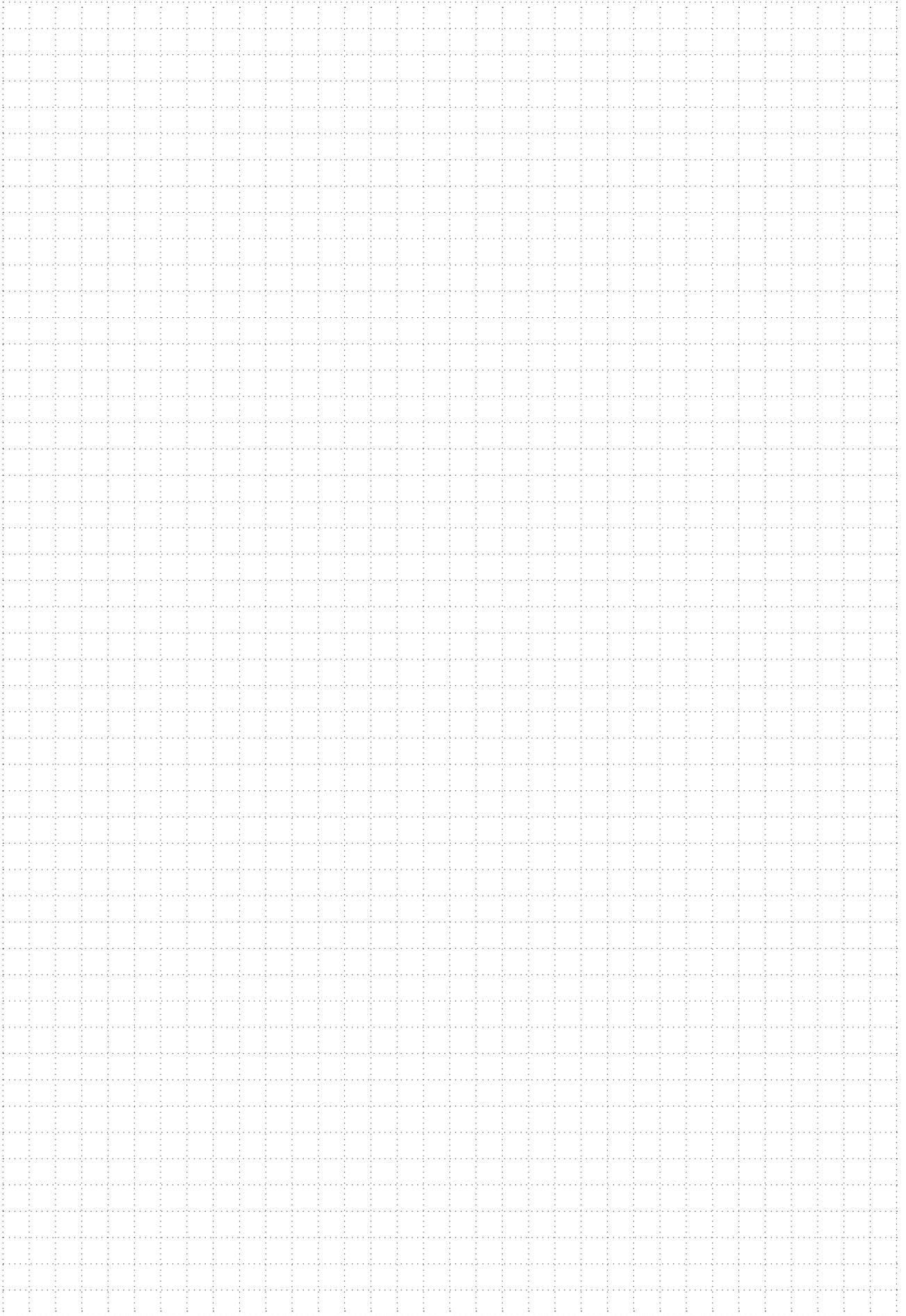
● mark: Standard stocked item Blank: Made-to-order item ● mark: Standard stocked item (new product/expanded item)

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability) Blank: Made-to-order item

MEMO



MEMO



MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for notes or a report.



- 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.

< SAFETY NOTES >

- 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>