

## <80 degree Rhombic Negative type>

Item Number	IC	T
CN_1204	12.7	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:		
				PVD Coated					CVD Coated								
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1				
				Steel	P	●	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice
				Stainless Steel	M	●	●	●	●	●	●	●	●	●	●		
				Cast Iron	K	●	●	●	●	●	●	●	●	●	●		
				Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●		
				Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●		
				Hardened Material	H	●	●	●	●	●	●	●	●	●	●		
	CNGG 120404 FN UL	CNGG431FNUL	0.4			●		●		●							F9 F11 G40 K34
UL	120408 FN UL	432FNUL	0.8			●		●		●							
	CNMG 120408 G	CNMG432-G	0.8										●				
G	120412 G	433-G	1.2										●				
G	120416 G	434-G	1.6										●				
	CNMG 120408 TNB Z5	432-TNB-Z5	0.8					●						●			
Z5																	
	CNGG 120404 FN ZP	CNGG431-FN-ZP	0.4			●	●						●				
ZP	120408 FN ZP	432-FN-ZP	0.8			●	●						●				

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

## <55 degree Rhombic Negative type>

Item Number	IC	T
DN_1504	12.7	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:	
				PVD Coated					CVD Coated							
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1			
				Steel	P	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice
				Stainless Steel	M	●	●	●	●	●	●	●	●	●		
				Cast Iron	K	●	●	●	●	●	●	●	●	●		
				Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●		
				Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●		
				Hardened Material	H	●	●	●	●	●	●	●	●	●		
	DNMG 150404 G	DNMG431-G	0.4										●			
G	150408 G	432-G	0.8										●			
G	150412 G	433-G	1.2										●			
	DNMG 150404 TN G	DNMG431-TN-G	0.4					●								
G																
	DNMG 150408 TNB Z5	DNMG432-TNB-Z5	0.8					●						●		
Z5																
	DNGG 150404 FN ZP	DNGG431-FN-ZP	0.4			●	●						●			
ZP	150408 FN ZP	432-FN-ZP	0.8			●	●						●			

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

Carbide

Negative type

Positive type

G

D

E

R

S

T

V

W

## <90 degree Square Negative type>

Item Number	IC	T
SN_1204	12.7	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide								Chip Control Range	For applicable holder, see pages:																																																																
				PVD Coated				CVD Coated																																																																					
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1			CP7	KM1																																																														
			<table border="1"> <tr><td>Steel</td><td>P</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Stainless Steel</td><td>M</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Cast Iron</td><td>K</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Non-Ferrous Material</td><td>N</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Heat Resistant Alloy</td><td>S</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Hardened Material</td><td>H</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> </table>	Steel	P	●	●	●	●	●	●	●	●	●	●	Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	Cast Iron	K	●	●	●	●	●	●	●	●	●	●	Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	Hardened Material	H	●	●	●	●	●	●	●	●	●	●	<ul style="list-style-type: none"> <li>● : 1st Choice</li> <li>● : 2nd choice</li> </ul>	
Steel	P	●	●	●	●	●	●	●	●	●	●																																																																		
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●																																																																		
Cast Iron	K	●	●	●	●	●	●	●	●	●	●																																																																		
Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●																																																																		
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●																																																																		
Hardened Material	H	●	●	●	●	●	●	●	●	●	●																																																																		
	SNMG 120408 G	SNMG432-G	0.8							●	●			F17 F19 K36																																																															
	SNMG 120412 G	SNMG433-G	1.2							●	●																																																																		
	SNMG 120416 G	SNMG434-G	1.6							●	●																																																																		
	SNMG 120408 TNB Z5	SNMG432-TNB-Z5	0.8			●					●																																																																		

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

## <60 degree Triangle Negative type>

Item Number	IC	T
TN_1604	9.525	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide								Chip Control Range	For applicable holder, see pages:																																																																
				PVD Coated				CVD Coated																																																																					
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1			CP7	KM1																																																														
			<table border="1"> <tr><td>Steel</td><td>P</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Stainless Steel</td><td>M</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Cast Iron</td><td>K</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Non-Ferrous Material</td><td>N</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Heat Resistant Alloy</td><td>S</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Hardened Material</td><td>H</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> </table>	Steel	P	●	●	●	●	●	●	●	●	●	●	Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	Cast Iron	K	●	●	●	●	●	●	●	●	●	●	Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	Hardened Material	H	●	●	●	●	●	●	●	●	●	●	<ul style="list-style-type: none"> <li>● : 1st Choice</li> <li>● : 2nd choice</li> </ul>	
Steel	P	●	●	●	●	●	●	●	●	●	●																																																																		
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●																																																																		
Cast Iron	K	●	●	●	●	●	●	●	●	●	●																																																																		
Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●																																																																		
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●																																																																		
Hardened Material	H	●	●	●	●	●	●	●	●	●	●																																																																		
	TNMG 160408 G	TNMG332-G	0.8							●	●																																																																		
	160412 G	333-G	1.2							●	●																																																																		
	TNMG 160404 TNB Z5	331-TNB-Z5	0.4			●				●																																																																			
	160408 TNB Z5	332-TNB-Z5	0.8			●				●																																																																			
	TNGG 160402 FN ZP	TNGG33Y-FN-ZP	0.2			●	●			●																																																																			
	160404 FN ZP	331-FN-ZP	0.4			●	●			●																																																																			
	160408 FN ZP	332-FN-ZP	0.8			●	●			●																																																																			
	TNGG 160402 F <sup>R</sup> / <sub>L</sub> C	TNGG33Y-F <sup>R</sup> / <sub>L</sub> -C	0.2			R								F23 F25 G39																																																															
	TNEG 160402 F <sup>R</sup> / <sub>L</sub> D1		0.2				●																																																																						
	160404 F <sup>R</sup> / <sub>L</sub> D1		0.4				●																																																																						
	160408 F <sup>R</sup> / <sub>L</sub> D1		0.8				●																																																																						
	TNGG 160401 F <sup>R</sup> / <sub>L</sub> DA	TNGG331CF <sup>R</sup> / <sub>L</sub> -DA	0.1			R	R																																																																						
	TNGG 160401 F <sup>R</sup> / <sub>L</sub> U2	TNGG331CF <sup>R</sup> / <sub>L</sub> -U2	0.1			R	R																																																																						
	160402 F <sup>R</sup> / <sub>L</sub> U2	33Y-F <sup>R</sup> / <sub>L</sub> -U2	0.2			●				●																																																																			
	160404 F <sup>R</sup> / <sub>L</sub> U2	331-F <sup>R</sup> / <sub>L</sub> -U2	0.4			●				●																																																																			
	160408 F <sup>R</sup> / <sub>L</sub> U2	332-F <sup>R</sup> / <sub>L</sub> -U2	0.8			●				●																																																																			
	TNGG 160401M FN UL	TNGG3304MFNUL	*0.08	●	●	●	●	●	●	●	●	●																																																																	
	160402M FN UL	3308MFNUL	*0.18	●	●	●	●	●	●	●	●	●																																																																	
	160404M FN UL	331MFNUL	*0.38	●	●	●	●	●	●	●	●	●																																																																	
	160408M FN UL	332MFNUL	*0.78	●	●	●	●	●	●	●	●	●																																																																	

\*Inserts having 01M, 02M or 04M as the R code can be used for machining when the component drawing specifies that the radius is less than R=0.1, R=0.2 or R=0.4 respectively. ● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

### <35 degree Rhombic Negative type>

Item Number	IC	T
VN_1604	9.525	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:		
				PVD Coated						CVD Coated							
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1				
				Steel	P	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice	
				Stainless Steel	M	●	●	●	●	●	●	●	●	●			
				Cast Iron	K	●	●	●	●	●	●	●	●	●			
				Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●			
				Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●			
				Hardened Material	H	●	●	●	●	●	●	●	●	●			
AM1	VNMG 160404 TNB AM1	331-TNB-AM1	0.4			●											
	160408 TNB AM1	332-TNB-AM1	0.8			●											
G	VNMG 160404 G	VNMG331-G	0.4									●				F27	
	160408 G	332-G	0.8								●						
	160412 G	333-G	1.2								●						
ZP	VNMG 160402 FN ZP	VNMG331-FN-ZP	0.2			●											
	160404 FN ZP	331-FN-ZP	0.4			●											
	160408 FN ZP	332-FN-ZP	0.8			●											

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

### <80 degree Hexagon Negative type>

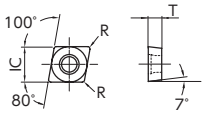
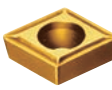
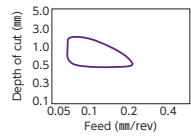
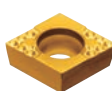
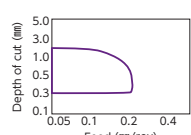

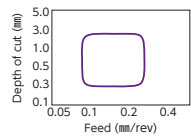
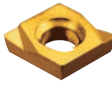
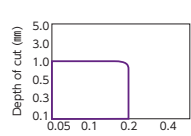
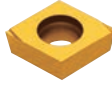
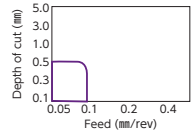
Item Number	IC	T
WN_0804	12.7	4.76

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:	
				PVD Coated						CVD Coated						
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1			
				Steel	P	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice	
				Stainless Steel	M	●	●	●	●	●	●	●	●	●		
				Cast Iron	K	●	●	●	●	●	●	●	●	●		
				Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●		
				Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●		
				Hardened Material	H	●	●	●	●	●	●	●	●	●		
G	WNMG 080408 G	WNMG432-G	0.8									●				
	080412 G	433-G	1.2								●					
Z5	WNMG 080408 TNB Z5	WNMG432-TNB-Z5	0.8			●										F29
	080412 TNB Z5	433-TNB-Z5	1.2			●										
ZP	WNGG 080404 FN ZP	WNGG431-FN-ZP	0.4			●	●					●				K37
	080408 FN ZP	432-FN-ZP	0.8			●	●					●				
UL	WNGG 080404 FN UL	WNGG431FNUL	0.4			●		●				●				
	080408 FN UL	432FNUL	0.8			●		●				●				

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

## <80 degree Rhombic Positive type>

Item Number	IC	T	Relief angle
CC_0602	6.35	2.38	7°
CC_09T3	9.525	3.97	7°

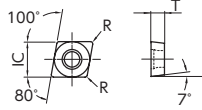
Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:			
				PVD Coated						CVD Coated								
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1					
				Steel	P	●	●	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Cast Iron	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Hardened Material	H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
 AM3	CCGT 060200 FN AM3		0.03				●											
	060202 FN AM3		0.2		●		●											
	060204 FN AM3		0.4		●													
	060201M FN AM3		*0.08	●		●		●	●									
	060202M FN AM3		*0.18	●		●		●	●									
	060204M FN AM3		*0.38	●		●		●	●									
	CCGT 09T300 FN AM3		0.03				●	●	●									
	09T302 FN AM3		0.2				●	●										
	09T304 FN AM3		0.4				●	●										
	09T301M FN AM3		*0.08	●	●	●	●	●	●									
	09T302M FN AM3		*0.18	●	●	●	●	●	●									
	09T304M FN AM3		*0.38	●	●	●	●	●	●									
 AZ7	CCGT 060200 AZ7		0.03			●												G23 K28
	060201M AZ7		*0.08			●												
	060202M AZ7		*0.18			●												
	CCGT 09T300 AZ7		0.03		●	●	●	●	●									
	09T301M AZ7		*0.08		●	●	●	●	●									
	09T302M AZ7		*0.18		●	●	●	●	●									
09T304M AZ7		*0.38		●	●	●	●	●										
 AZ8	CCMT 060202 ENA AZ8		0.2															
	060204 ENB AZ8		0.4															
	060208 ENB AZ8		0.8															
	CCMT 09T302 ENA AZ8		0.2															
	09T304 ENB AZ8		0.4															
09T308 ENB AZ8		0.8																
 F1 R-hand shown	CCGT 060201 FR <sub>L</sub> F1		0.1	R		R		R										
	060202 FR <sub>L</sub> F1		0.2	R		R		R										
	060204 FR <sub>L</sub> F1		0.4	R		R		R										
	CCGT 09T302 FR <sub>L</sub> F1		0.2	R		R		R										
	09T304 FR <sub>L</sub> F1		0.4	R		R		R										
 KHG	CCET 0602005 R <sub>L</sub> KHG		0.05				●											
	0602008 R <sub>L</sub> KHG		0.08				●											
	0602018 R <sub>L</sub> KHG		0.18				●											
	060202 R <sub>L</sub> KHG		0.2				●											
	CCET 09T3005 R <sub>L</sub> KHG		0.05				●	R										
	09T3008 R <sub>L</sub> KHG		0.08				●	R										
	09T3018 R <sub>L</sub> KHG		0.18				●	R										
09T302 R <sub>L</sub> KHG		0.2				●	R											

\*Inserts having 01M, 02M or 04M as the R code can be used for machining when the component drawing specifies that the radius is less than R=0.1, R=0.2 or R=0.4 respectively.

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

### <80 degree Rhombic Positive type>

Item Number	IC	T	Relief angle
CC_0602	6.35	2.38	7°
CC_09T3	9.525	3.97	7°



Material	P	M	K	N	S	H
Steel	●	●	●	●	●	●
Stainless Steel	●	●	●	●	●	●
Cast Iron	●	●	●	●	●	●
Non-Ferrous Material	●	●	●	●	●	●
Heat Resistant Alloy	●	●	●	●	●	●
Hardened Material	●	●	●	●	●	●

● : 1st Choice  
● : 2nd choice

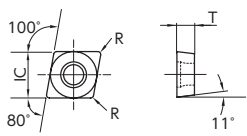

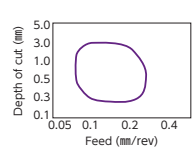

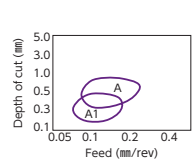

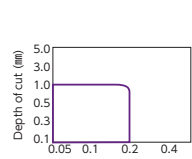

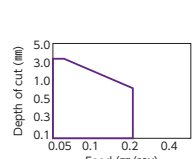
Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:		
				PVD Coated						CVD Coated							
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1				
	CCGT 060200	R/4 S	0.03	●	●	●	●	●	●	●	●						
	060201	R/4 S	0.1	●	●	●	●	●	●	●	●						
	060202	R/4 S	0.2	●	●	●	●	●	●	●	●						
	060201M	R/4 S	*0.08		R				R								
	060202M	R/4 S	*0.18		R				R								
	CCGT 09T300	R/4 S	0.03	R	●		R	R									
	09T301	R/4 S	0.1	●	R	●											
	09T302	R/4 S	0.2	R	R	●											
	09T304	R/4 S	0.4	R													
	09T301M	R/4 S	*0.08		R		R	R									
09T302M	R/4 S	*0.18		R		R	R										
09T304M	R/4 S	*0.38		R		R	R										
	CCGT 060200	R/4 U	0.03		R				R								
	060201	R/4 U	0.1	●				R									
	060202	R/4 U	0.2	●				R									
	CCGT 09T300	R/4 U1	0.03	●				R	R								
	09T301	R/4 U1	0.1	●				R	R								
	09T302	R/4 U1	0.2	●				R	R								
	CCGT 060201M	CL	*0.08	●	●	●	●	●	●	●	●					G23 K28	
	060202M	CL	*0.18	●	●	●	●	●	●	●	●						
	09T300	CL	0.03					●	●								
	09T301M	CL	*0.08	●	●	●	●	●	●	●	●						
	09T302M	CL	*0.18	●	●	●	●	●	●	●	●						
	CCGT 09T300	YL	0.03					●	●								
	09T301M	YL	0.08	●	●	●	●	●	●	●	●						
	09T302M	YL	0.18	●	●	●	●	●	●	●	●						
	09T304M	YL	0.38	●	●	●	●	●	●	●	●						
	09T308M	YL	0.78	●	●	●	●	●	●	●	●						
	CCGW 060200	FN	0.03	●													
	060201	FN	0.1	●													
	060200	H (M)	0.03									●					
	060201	H (M)	0.1									●					
	060202	H (M)	0.2									●					
	CCGW 09T300	FN	0.03	●													
	09T301	FN	0.1	●													
	09T300	H (M)	0.03									●					
	09T301	H (M)	0.1									●					
	09T302	H (M)	0.2									●					
	09T302M	P (M)	*0.18							●							
	09T30	V (M)	0.0					●									
09T301	P (M)	0.1					●										
09T302	P (M)	0.2					●										

\* Inserts having 01M, 02M or 04M as the R code can be used for machining when the component drawing specifies that the radius is less than R=0.1, R=0.2 or R=0.4 respectively.  
 ● : Standard stock ● : New standard stock ■ : Scheduled to be produced by order ★ : Standard stock (Specified)  
 ※2 The specifications of CL chipbreaker are slightly different from the above dimensions, but it has no problem for machining.

## <80 degree Rhombic Positive type>

Item Number	IC	T	Relief angle
CP_0401	4.76	1.59	11°
CP_0602	6.35	2.38	11°

Item Number	IC	T	Relief angle
CP_0802	7.94	2.38	11°
CP_0903	9.525	3.18	11°

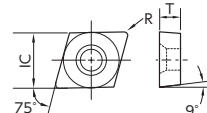
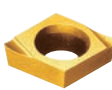
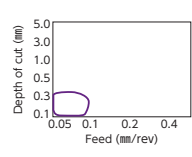
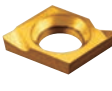
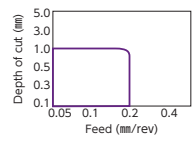
Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:			
				PVD Coated						CVD Coated								
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1					
				Steel	P	●	●	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Cast Iron	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Hardened Material	H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
 AM5	CPGH 060202 FN AM5	CPGP83Y-FN--AM5	0.2	●			●											
	CPGH 080202 FN AM5	CPGP03Y-FN--AM5	0.2	●			●											
	CPGH 090302 FN AM5	CPGM32Y-FN--AM5	0.2	●			●											
	090304 FN AM5	321-FN--AM5	0.4	●			●											
	090308 FN AM5	322-FN--AM5	0.8	●			●											
 A · A1 L-hand shown	CPGH 040102 F <sub>R/L</sub> A1	CPGP62Y-F <sub>R/L</sub> --A1	0.2	L			L											
	040104 F <sub>R/L</sub> A1	621-F <sub>R/L</sub> --A1	0.4	L			L											
	CPGH 060202 F <sub>R/L</sub> A	CPGP83Y-F <sub>R/L</sub> --A	0.2	L			L											
	060204 F <sub>R/L</sub> A	831-F <sub>R/L</sub> --A	0.4	L			L											
	CPGH 080202 F <sub>R/L</sub> A	CPGP03Y-F <sub>R/L</sub> --A	0.2	L			L											
080204 F <sub>R/L</sub> A	031-F <sub>R/L</sub> --A	0.4	L			L												
 F1 R-hand shown	CPGH 040101 F <sub>R/L</sub> F1		0.1	R			R											
	040102 F <sub>R/L</sub> F1		0.2	R			R											
	040104 F <sub>R/L</sub> F1		0.4	R			R											
	CPGH 060202 F <sub>R/L</sub> F1		0.2	R			R											
	060204 F <sub>R/L</sub> F1		0.4	R			R											
 S L-hand shown	CPGH 040101 <sub>R/L</sub> S		0.1				L		L									
	040102 <sub>R/L</sub> S		0.2				L		L									
	040104 <sub>R/L</sub> S		0.4				L		L									
	CPGH 060202 <sub>R/L</sub> S		0.2				L		L									
	060204 <sub>R/L</sub> S		0.4				L		L									

● : Standard stock   ● : New standard stock   ■ : Scheduled to be produced by order   ★ : Standard stock (Specified)

New Products  
 Tool Materials / Selection Guide  
 Micrograin Carbide, BIDEIMS, PCD, PVD Coated Carbide, CBN and Ceramics  
 Insert Item List  
 General Turning Toolholders  
 Unique Swiss Tooling  
 Grooving / Side Turning  
 Threading  
 Shaper  
 ID Tooling  
 Application Introduction  
 Endmills  
 Rotating Tools  
 Information  
 Index

## <75 degree Rhombic Positive type>

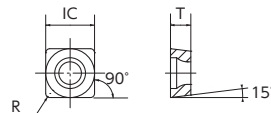

Item Number	IC	T	Relief angle
<b>ER_T301</b>	3.97	1.59	9°

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:																																																																																				
				PVD Coated						CVD Coated																																																																																									
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1																																																																																						
 <table border="1"> <tr><td>Steel</td><td>P</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Stainless Steel</td><td>M</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Cast Iron</td><td>K</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Non-Ferrous Material</td><td>N</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Heat Resistant Alloy</td><td>S</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>Hardened Material</td><td>H</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> </table>				Steel	P	●	●	●	●	●	●	●	●	●	●	●	●	Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	●	●	Cast Iron	K	●	●	●	●	●	●	●	●	●	●	●	●	Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	●	●	Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●	Hardened Material	H	●	●	●	●	●	●	●	●	●	●	●	●	<p>● : 1st Choice ● : 2nd choice</p>											
Steel	P	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
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Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Hardened Material	H	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
 A2 R-hand shown	<b>ERGH T30102 F<sub>R</sub>/L A2</b>	<b>ERGP52Y-F<sub>R</sub>/L--A2</b>	0.2	●			■	●										K27																																																																																	
	<b>T30104 F<sub>R</sub>/L A2</b>	<b>521-F<sub>R</sub>/L--A2</b>	0.4	L				●																																																																																											
 F1 ※ R-hand shown	<b>ERGH T30101 F<sub>R</sub>/L F1</b>	—	0.1	R		R		R										K27																																																																																	
	<b>T30102 F<sub>R</sub>/L F1</b>	—	0.2	R		R		R																																																																																											
	<b>T30104 F<sub>R</sub>/L F1</b>	—	0.4	R		R		R																																																																																											

※For F05, F1 and FG chipbreaker, right-hand inserts fit to right-hand toolholder. ● : Standard stock ● : New standard stock ■ : Scheduled to be produced by order ★ : Standard stock (Specified)

## <90 degree Square Positive type>

Item Number	IC	T	Relief angle
<b>SD_0602</b>	6.35	2.38	15°

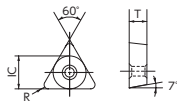
Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:																																																																																				
				PVD Coated						CVD Coated																																																																																									
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1																																																																																						
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Steel	P	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Stainless Steel	M	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Cast Iron	K	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
Hardened Material	H	●	●	●	●	●	●	●	●	●	●	●	●																																																																																						
 without chipbreaker	<b>SDEW 060202 FN</b>		0.2	●																																																																																															

● : Standard stock ● : New standard stock ■ : Scheduled to be produced by order ★ : Standard stock (Specified)

### <60 degree Triangle Positive type>


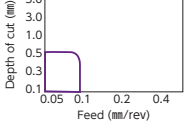

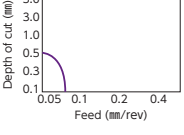

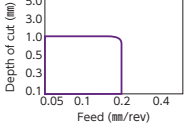
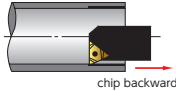

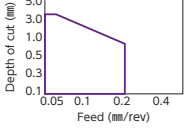

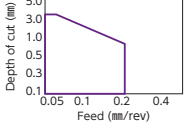

Item Number	IC	T	Relief angle
TC_0601	3.97	1.59	7°
TC_06T1	3.97	1.98	7°

Item Number	IC	T	Relief angle
TC_0902	5.56	2.38	7°
TC_1102	6.35	2.38	7°



Material	P	M	K	N	S	H
Steel	●	●	●	●	●	●
Stainless Steel	●	●	●	●	●	●
Cast Iron	●	●	●	●	●	●
Non-Ferrous Material	●	●	●	●	●	●
Heat Resistant Alloy	●	●	●	●	●	●
Hardened Material	●	●	●	●	●	●

● : 1st Choice  
● : 2nd choice

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:		
				PVD Coated						CVD Coated							
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1				
 K L-hand shown	TCGH 060102 F <sub>R/L</sub> K		0.2														
	060104 F <sub>R/L</sub> K		0.4														
 B1 L-hand shown	TCGH 060102 F <sub>R/L</sub> B1	TCGP52Y-F <sub>R/L</sub> -B1	0.2		L				L								K30 K31 K32
	060104 F <sub>R/L</sub> B1	521-F <sub>R/L</sub> -B1	0.4		L				L								
 F05 ※ R-hand shown	TCGH 060101 F <sub>R/L</sub> F05	TCGP521CF <sub>R/L</sub> -F05	0.1	R		R			R							 	
	060102 F <sub>R/L</sub> F05	52Y-F <sub>R/L</sub> -F05	0.2	R	●	R	■	●									
	060104 F <sub>R/L</sub> F05	521-F <sub>R/L</sub> -F05	0.4	R	R	R	■	R									
 S R-hand shown	TCGT 090201 R <sub>L</sub> S		0.1		R		●										
	090202 R <sub>L</sub> S		0.2		R												
	TCGT 110201 R <sub>L</sub> S		0.1		R		●										
 U R-hand shown	TCGT 090201 R <sub>L</sub> U		0.1		R												G36
	090202 R <sub>L</sub> U		0.2		R												
 without chipbreaker	TCGW 06T108 FN		0.8		●											—	
	TCGW 090200 FN		0.03		●												
	090201 FN		0.1		●												
	TCGW 110200 FN		0.03		●												
	110201 FN		0.1		●												

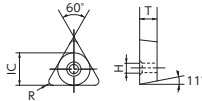

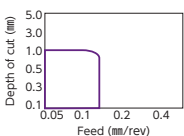
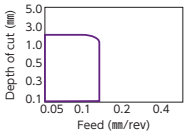

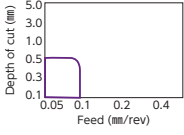

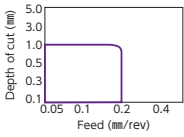
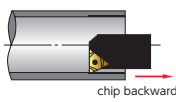

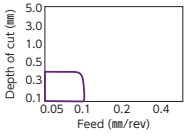
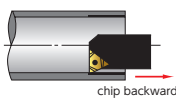
※For F05 chipbreaker, right-hand inserts fit to right-hand toolholder.

● : Standard stock ● : New standard stock ■ : Scheduled to be produced by order ★ : Standard stock (Specified)



## <60 degree Triangle Positive type>

Item Number	IC	T	Relief angle
TP_0802	4.76	2.38	11°
TP_0902	5.56	2.38	11°
TP_1103	6.35	3.18	11°

Shape	ISO Item Number	Inch Item Number	R	Carbide										Chip Control Range	For applicable holder, see pages:		
				PVD Coated						CVD Coated							
				ST4	ZM3	QM3	VM1	TM4	DT4	DM4	CP1	CP7	KM1				
				Steel	P	●	●	●	●	●	●	●	●	●	●	●	● : 1st Choice ● : 2nd choice
				Stainless Steel	M	●	●	●	●	●	●	●	●	●	●		
				Cast Iron	K	●	●	●	●	●	●	●	●	●	●		
				Non-Ferrous Material	N	●	●	●	●	●	●	●	●	●	●		
				Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●		
				Hardened Material	H	●	●	●	●	●	●	●	●	●	●		
 B2 · B3 L-hand shown	TPGH 090202 F <sub>R/L</sub> B2	TPGP73Y-F <sub>R/L</sub> --B2	0.2		L				L								
	090204 F <sub>R/L</sub> B2	731-F <sub>R/L</sub> --B2	0.4		L				L								
	090208 F <sub>R/L</sub> B2	732-F <sub>R/L</sub> --B2	0.8		L				L								
	TPGH 080202 F <sub>R/L</sub> B3	TPGP63Y-F <sub>R/L</sub> --B3	0.2		L				L								
	080204 F <sub>R/L</sub> B3	631-F <sub>R/L</sub> --B3	0.4		L				L								
 K L-hand shown	TPGH 090202 F <sub>R/L</sub> K		0.2						L								
	090204 F <sub>R/L</sub> K		0.4						L								
	090208 F <sub>R/L</sub> K		0.8						L								
 F1 ※ R-hand shown	TPGH 080202 F <sub>R/L</sub> F1	TPGP63Y-F <sub>R/L</sub> --F1	0.2		R			R	R						 		
	080204 F <sub>R/L</sub> F1	631-F <sub>R/L</sub> --F1	0.4		R			R	R								
	TPGH 090201 F <sub>R/L</sub> F1	TPGP731CF <sub>R/L</sub> --F1	0.1	R		R			R								
	090202 F <sub>R/L</sub> F1	73Y-F <sub>R/L</sub> --F1	0.2	R	R	R			R	R							
	090204 F <sub>R/L</sub> F1	731-F <sub>R/L</sub> --F1	0.4	R	R	R			R	R							
	090208 F <sub>R/L</sub> F1	732-F <sub>R/L</sub> --F1	0.8	R	R	R			R								
	TPGH 110302 F <sub>R/L</sub> F1	TPGH22Y-F <sub>R/L</sub> --F1	0.2	R	R	R			R	R							
110304 F <sub>R/L</sub> F1	221-F <sub>R/L</sub> --F1	0.4	R	R	R			R	R								
 FG ※ R-hand shown	TPGH 090202 <sub>R/L</sub> FG		0.2	R					R					 			
	090204 <sub>R/L</sub> FG		0.4	R					R								
	TPGH 110302 <sub>R/L</sub> FG		0.2	R					R								
	110304 <sub>R/L</sub> FG		0.4	R					R								

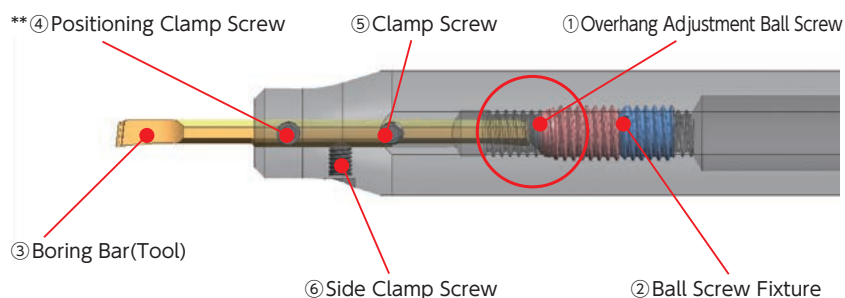
※For F1 and FG chipbreaker, right-hand inserts fit to right-hand toolholder. ● : Standard stock ● : New standard stock ■ : Scheduled to be produced by order ★ : Standard stock (Specified)

# STICK DUO HYPER

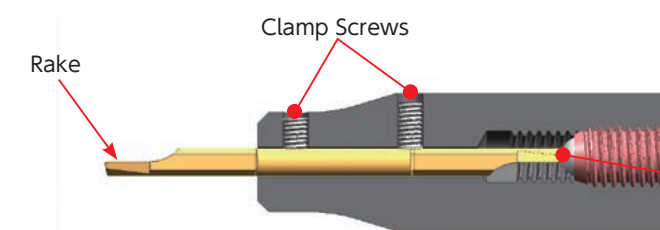
## - Sleeves for ID Boring with Adjustable Overhang Mechanism -



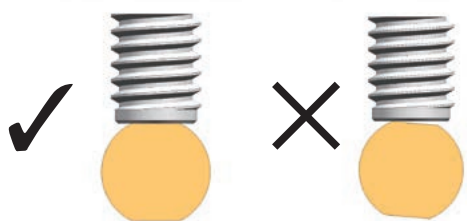
### Can Index boring bars like inserts



### Installation Procedure for STICK DUO Hyper



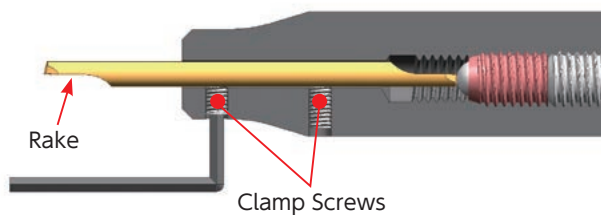
Caution: Improper installation dramatically increases the chance of chipping cutting edge



Improper clamping of boring bar causes unstable centerline height and offset

- ① Position the overhang adjustment ball screw to determine overhang amount
  - ② Slide the ball screw fixture to secure the ball screw location
  - ③ Insert a boring bar (tool)
    - Note: Make sure to insert the boring bar correctly so that the rake face is toward the side where the clamp screws are located
  - ④ Secure the boring bar by tightening the positioning clamp screw ▶ Recommended Clamping Torque: 2.0N·m
    - \*\* Make sure to clamp the boring bar so that the flat surface of the bar makes proper contact with clamp screws
  - ⑤ Secure the boring bar by tightening the remaining clamp screws ▶ Recommended Clamping Torque: 2.0N·m
  - ⑥ Even if 4 and 5 cannot be performed due to tool clearance and layout, the tool can be used by only securing the side clamp screw
- Once the initial setup is complete, repeat the above procedures 3 thru 5 for each index

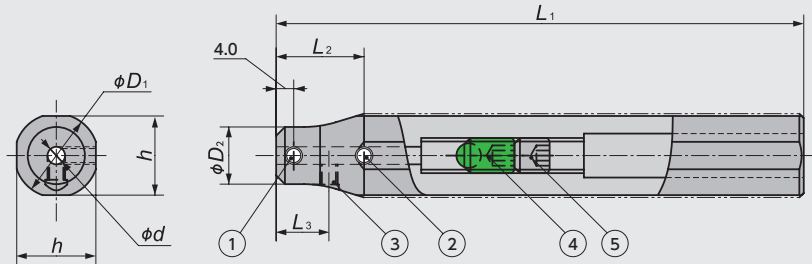
### When the tool is installed upside down



Toolholder must be installed so that clamp screws and rake of the tool face toward the same side

## STICK DUO HYPER - Sleeves for ID machining -

### HY-NBH



Please refer to  $\phi d$  to find correct-size inserts (bars)

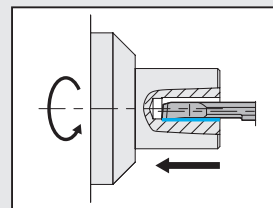
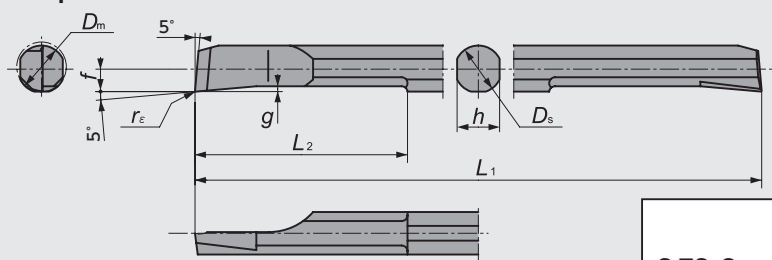
Code No.	Item Number	Stock	Dimensions (mm)							Clamp Screw		
			$\phi d$	$\phi D_1$	$\phi D_2$	$h$	$L_1$	$L_2$	$L_3$	①	②	③
5709894	<b>HY-NBH02016H</b>	●	2.0	16	11	15	100	15	9.5	SS04045FS	SS0406F	SS0404F
5709902	<b>02516H</b>	●	2.5		11.5							
5709910	<b>03016H</b>	●	3.0		12							
5709936	<b>03516H</b>	●	3.5		12.5							
5709944	<b>04016H</b>	●	4.0		13							
5709951	<b>05016H</b>	●	5.0		14							
5709969	<b>HY-NBH02019K</b>	●	2.0	19.05	11	18	125	15	9.5	SS04045FS	SS0406F	SS0404F
5709977	<b>02519K</b>	●	2.5		11.5							
5709985	<b>03019K</b>	●	3.0		12							
5709993	<b>03519K</b>	●	3.5		12.5							
5710009	<b>04019K</b>	●	4.0		13							
5710017	<b>05019K</b>	●	5.0		14							
5712708	<b>HY-NBH02020K</b>	●	2.0	20	11	19	125	15	9.5	SS04045FS	SS0406F	SS0404F
5712716	<b>02520K</b>	●	2.5		11.5							
5712724	<b>03020K</b>	●	3.0		12							
5712740	<b>03520K</b>	●	3.5		12.5							
5712757	<b>04020K</b>	●	4.0		13							
5712765	<b>05020K</b>	●	5.0		14							
5712773	<b>HY-NBH02022K</b>	●	2.0	22	11	21	125	15	9.5	SS04045FS	SS0406F	SS0404F
5712799	<b>02522K</b>	●	2.5		11.5							
5712831	<b>03022K</b>	●	3.0		12							
5712856	<b>03522K</b>	●	3.5		12.5							
5712872	<b>04022K</b>	●	4.0		13							
5712914	<b>05022K</b>	●	5.0		14							
5712732	<b>HY-NBH02025K-MET</b>	●	2.0	25	11	24	125	15	9.5	SS04045FS	SS0406F	SS0404F
5712823	<b>02525K-MET</b>	●	2.5		11.5							
5712849	<b>03025K-MET</b>	●	3.0		12							
5712864	<b>03525K-MET</b>	●	3.5		12.5							
5712898	<b>04025K-MET</b>	●	4.0		13							
5712922	<b>05025K-MET</b>	●	5.0		14							
5713003	<b>HY-NBH02025K</b>	●	2.0	25.4	11	24	125	15	9.5	SS04045FS	SS0406F	SS0404F
5713029	<b>02525K</b>	●	2.5		11.5							
5713045	<b>03025K</b>	●	3.0		12							
5713060	<b>03525K</b>	●	3.5		12.5							
5713086	<b>04025K</b>	●	4.0		13							
5713102	<b>05025K</b>	●	5.0		14							

### Spare Parts

Item Number	Overhang Adjustment		Wrench	
	④	⑤	for ①②③	for ④⑤
<b>HY-NBH ... K</b>	SS0812R	SS0808F	LW-2	LW-4×104

## Bars for STICK DUO SPLASH / STICK DUO HYPER

### SHFS-S Chips can be evacuated forward

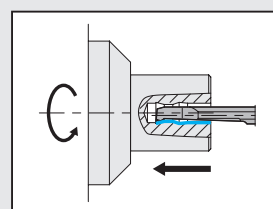
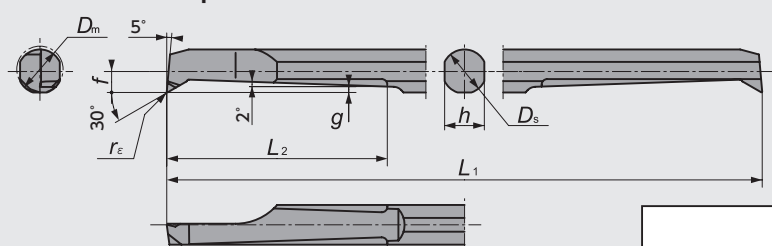


S.FS-S type

Chipbreaker for sharp cutting

Figure-1

### SHFB-F Evacuate chips backward



S.FB-F type

Back taper  
Wide area of chip pocket

Figure-2

### SHFS-H Flat type (without chipbreaker)

Mirror finish

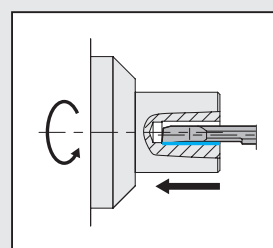
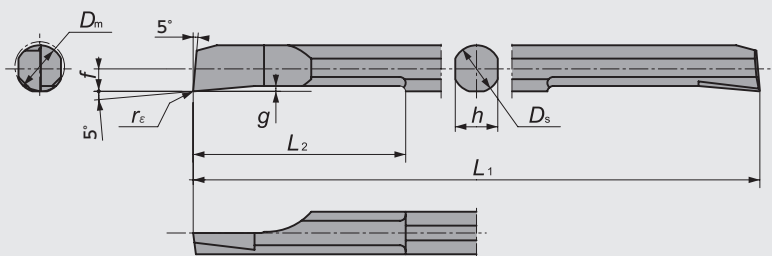
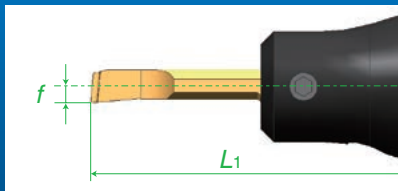
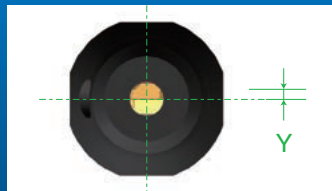


Figure-3

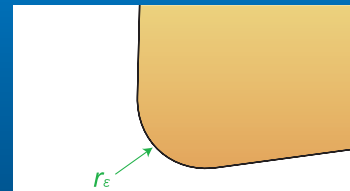
### Tolerance of SHFS-S/SHFB-F/SHFS-H bars



Offset  $f$  :  $\pm 0.015\text{mm}$   
Tool Length  $L_1$  :  $\pm 0.02\text{mm}$



Centerline Y :  $+0.05/-0\text{mm}$



Corner  $r_\epsilon$  :  $\pm 0.015\text{mm}$

### Repeatability of (STICK DUO SPLASH) with (SHFS) bars (STICK DUO Hyper) with (SHFB) bars

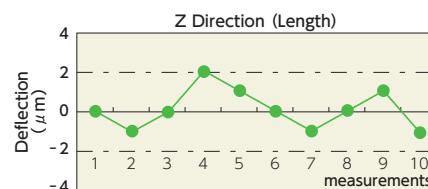
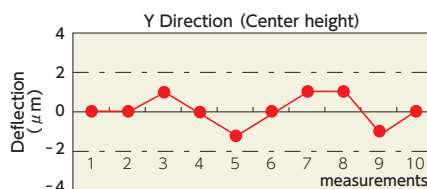
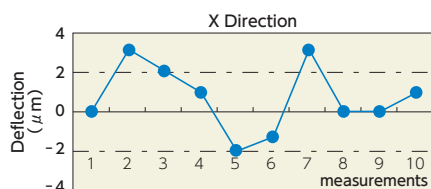













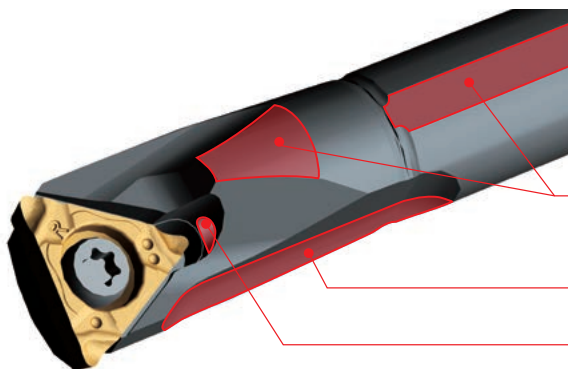
Figure	Item Number	Min Bore Dia. (mm) $D_m$	Chip-breaker	Dimensions (mm)							PVD Coated Carbide	
				$D_s$	$L_1$	$L_2$	$f$	$h$	$g$	$r_e$	TM4	Stock
1	SHFS020R005S	2.2	Yes	2	50	10	0.9	1.8	0.25	0.05	5709548	●
	025R005S	2.7		2.5	50	12.5	1.15	2.3	0.30	0.05	5709563	●
	025R015S									0.15	5709571	●
	030R005S	3.2		3	50	15	1.4	2.7	0.40	0.05	5709589	●
	030R015S									0.15	5709597	●
	035R005S	3.7		3.5	60	17.5	1.65	3.2	0.40	0.05	5709605	●
	035R015S									0.15	5709613	●
	040R005S	4.2		4	60	20	1.9	3.6	0.45	0.05	5709621	●
	040R015S									0.15	5709639	●
	050R005S	5.2		5	70	25	2.4	4.5	0.50	0.05	5709647	●
050R015S	0.15		5709654							●		
2	SHFB020R005F	2.2	Yes	2	50	8	0.95	1.8	0.25	0.05	5709779	●
	025R005F	2.7		2.5	50	12.5	1.2	2.3	0.30	0.05	5709787	●
	025R015F									0.15	5709795	●
	030R005F	3.2		3	50	15	1.4	2.7	0.45	0.05	5709803	●
	030R015F									0.15	5709811	●
	035R005F	3.7		3.5	60	17.5	1.65	3.2	0.50	0.05	5709829	●
	035R015F									0.15	5709837	●
	040R005F	4.2		4	60	20	1.9	3.6	0.50	0.05	5709845	●
	040R015F									0.15	5709852	●
	050R005F	5.2		5	70	25	2.4	4.5	0.70	0.05	5709860	●
050R015F	0.15		5709878							●		
3	SHFS020R005H 	2.2	No	2	50	10	0.9	1.8	0.25	0.05	5709662	●
	025R005H 	2.7		2.5	50	12.5	1.15	2.3	0.30	0.05	5709670	●
	025R015H 									0.15	5709688	●
	030R005H 	3.2		3	50	15	1.4	2.7	0.40	0.05	5709696	●
	030R015H 									0.15	5709704	●
	035R005H 	3.7		3.5	60	17.5	1.65	3.2	0.40	0.05	5709712	●
	035R015H 									0.15	5709720	●
	040R005H 	4.2		4	60	20	1.9	3.6	0.45	0.05	5709738	●
	040R015H 									0.15	5709746	●
	050R005H 	5.2		5	70	25	2.4	4.5	0.50	0.05	5709753	●
050R015H 	0.15		5709761							●		

※Caution: Due to the tolerance, it might not fit into the holder which is made by other company.

- New Products
- Tool Materials / Selection Guide
- PCD, PCBN and Ceramics
- Micrograin Carbide, BIDEIMCS, PCD, PCD/Coated Carbide, CBN and Ceramics
- Insert Item List
- General Turning Toolholders
- General Turning Toolholders
- Unique Swiss Tooling
- Grooving / Side Turning
- Threading
- Shaper
- ID Tooling
- Application Introduction
- Endmills
- Rotating Tools
- Information
- Index

# Mogul Bar

High rigidity boring bars



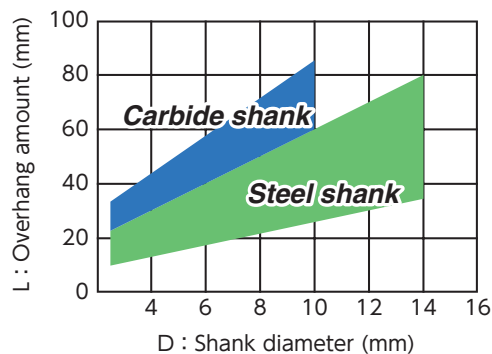
### Features

- **High rigidity + Minimal flat widths**  
Reduce vibration
- **Large clearance for improved chip evacuation**
- **All Mogul Bar boring bars are coolant through**

### Recommended amount of overhang

Steel Shank  $L/D \leq 5$

Carbide Shank  $L/D \leq 7$



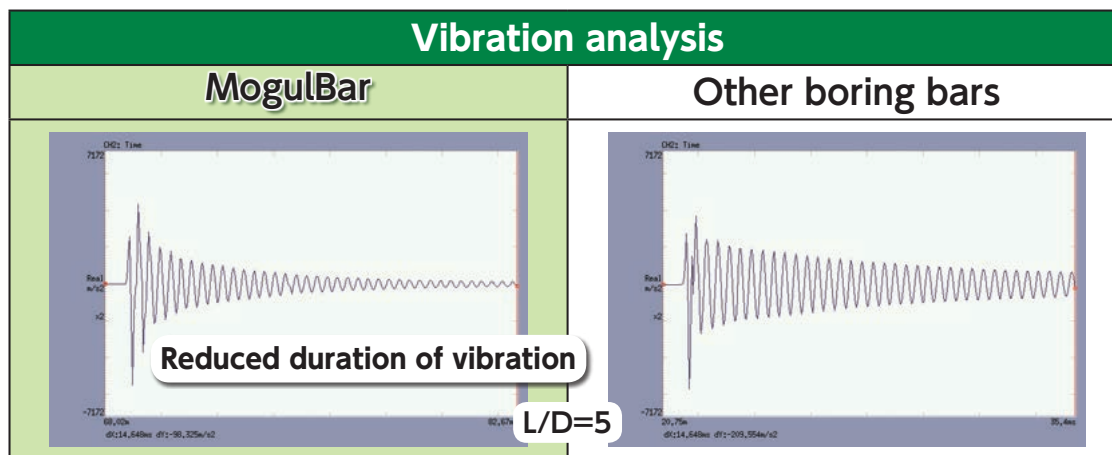
L : Overhang  
D : Shank diameter

[Cutting condition example]

Work materials: Alloy steel, stainless

$V_c=80\text{m/min}$   $f=0.05 \sim 0.1\text{mm/rev}$   $a_p=0.1 \sim 0.5\text{mm(DOC)}$  WET

### Vibration analysis



Note: Assuming a 100N load is applied. An equal amount of force was applied to both bars for vibration analysis.

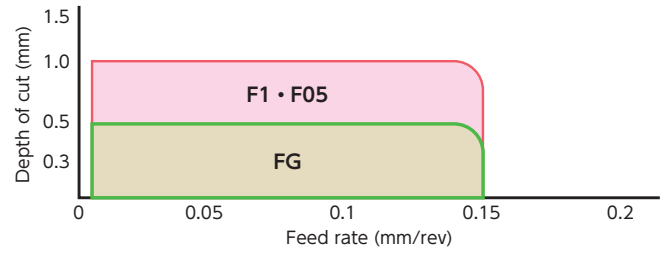
Boring bar used in above analysis: S08H-STUPR09D10-OH

## F Chipbreakers - Evacuate chips BACKWARD

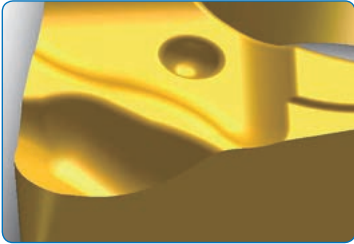

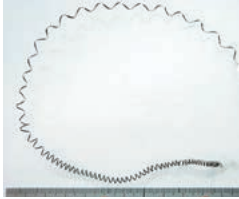
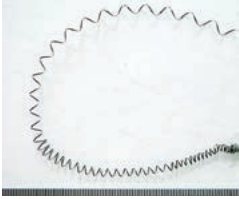
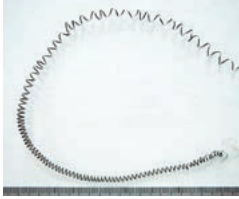



- F chipbreakers allow chips to evacuate backward
- Combination of the F-chipbreakers and Mogul Bar delivers the best performance



### Recommended Cutting Condition Range



## F Chipbreakers - Features

	DOC (mm)	Feed(mm/rev)	
		0.05	0.1
<b>FG Chipbreaker</b> <ul style="list-style-type: none"> <li>● Best for finishing</li> <li>● Works for small DOC (0.5mm or less)</li> <li>● High rake angle</li> </ul> 	0.1		
	0.3		
<b>F1/F05 Chipbreakers</b> <ul style="list-style-type: none"> <li>● Cover wide condition range</li> <li>● Ground chipbreaker</li> </ul> 	0.5		
Note: Right-hand inserts with FG and F1 chipbreakers should be used with right-hand holders		[Cutting condition example] SCM435 Diameter : $\phi$ 12.0 $V_c=80\text{m/min}$ Depth of Bore : 20mm Wet Holder : S10K-STUPR11D12-OH Insert : TPGH110304	