

2015▶2016
General Catalog



SUMITOMO

CARBIDE - CBN - DIAMOND

High Performance Cutting Tools

**Global Support
Global Solutions**

GENERAL INFORMATION - TURNING

Pages 5-13



Turning

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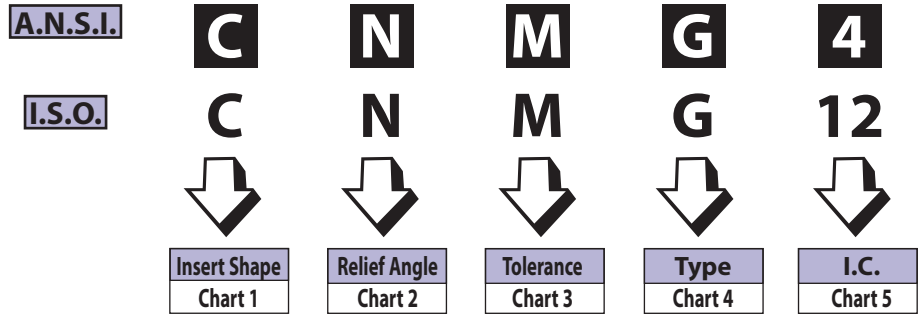


Chart 1 Insert Shape

Symbol	Insert Shape
V	35° Diamond
D	55° Diamond
T	60° Triangle
C	80° Diamond
W	80° Trigon
S	90° Square
R	Round
A, K, M	Parallelogram

Chart 2 Relief Angle









Symbol	Relief Angle	
N	0°	
B	5°	
C	7°	
P	11°	
D	15°	
E	20°	
F	25°	

Chart 3 Tolerance

Symbol	Insert I.C.	Thickness	Nose Position
A	±.001	±.001	±.0002
C	±.001	±.001	±.0005
E	±.001	±.001	±.001
F	±.0005	±.001	±.0002
G	±.001	±.005	±.001
J	±.002	±.001	±.002
M	See Chart 3.1		
U	See Chart 3.1		

Chart 5 Inscribed Circle

Sumitomo Number	I.S.O. Number							
	R	S	T	C	D	V	W	I.C.
(5)			06				03	5/32"
(6)			08					3/16"
			09					7/32"
	06							(.236)
2		06	11	06	07		04	1/4"
2.5		07		08	09			5/16"
	08							(.315)
3	09	09	16	09	11	16	06	3/8"
	10							(.394)
	12							(.472)
4	12	12	22	12	15	22	08	1/2"
5	15	15	27	16				5/8"
	16							(.630)
6	19	19	33	19				3/4"
	20							(.787)
	25							(.984)
8	25	25						1
	31							1-1/4"
	32							(1.260)

Chart 6 Thickness

Sumitomo Number	I.S.O. Number	Thickness
(2)	01	1/16"
1.5	02	3/32"
2	03	1/8"
2.5	T3	5/32"
3	04	3/16"
—	05	7/32"
4	06	1/4"
5	07	5/16"
5	08	5/16"
6	09	3/8"



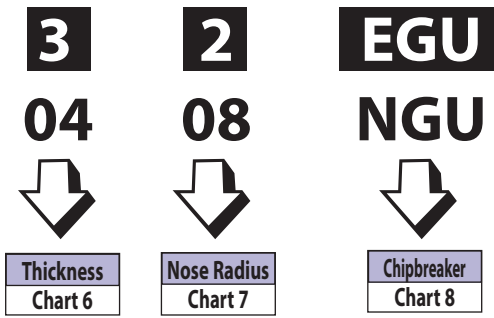


Chart 3.1 "M" and "U" Class Tolerance's

	Inscribed Circle		Nose Position Tolerance				Thickness
	M	U	M		U	M & U	
Shapes	All	All	S, T, C, R, W	D	V	All	All
I.C. Size							±.005
5/32 - 3/8	±.002	±.003	±.003	±.004	±.007	±.005	
7/16 - 9/16	±.003	±.005	±.005	±.006	±.010	±.008	
5/8 - 3/4	±.004	±.007	±.006	±.006	-	±.001	
7/8	±.006	±.010	±.006	±.006	-	±.015	
1	±.006	±.010	±.007	±.007	-	±.015	
1 1/4	±.006	±.010	±.008	±.008	-	±.015	

Chart 4

Symbol	Hole	Chipbreaker	Hole Style
A	Yes	No	Straight
G	Yes	Double	Straight
M	Yes	Single	Straight
N	No	No	None
R	No	Single	None
D	Yes	No	Countersunk
T	Yes	Single	Countersunk
X	Yes	10° Rake Angle	Straight or Countersunk
E	No	No	None

Chart 7 Nose Radius

Sumitomo Number	I.S.O. Number	Radius
v	00	.0012"
001	.0039"	
0.5	02	.0079"
1	04	.0156"
—	05	.0197"
2	08	.0312"
—	10	.0394"
3	12	.0469"
—	15	.0591"
4	16	.0625"
6	24	.0938"
8	32	.1250"
—	40	.1575"

Chart 8 Chipbreaker

See Pages 9-10 for chipbreaker information.



CVD Coated Grades




Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P Steel	AC810P	91.0	2.2	Super FF Coat	18	A new P10 grade with excellent wear resistance that features stability and longer tool life. Utilises a special carbide substrate with Super FF Coat for high to medium speed cutting.	AC700G
	AC820P	90.1	2.2	Super FF Coat	14	A P20 grade that features stability and longer tool life. Employs special carbide substrate and Super FF Coat to improve on P20 wear and fracture resistance.	AC2000
	AC830P	89.4	2.6	Super FF Coat	8	Stable long-life grade employs special tough, carbide substrate and Super FF Coat. Improves on P30 grade fracture resistance and approaches P20 grade in terms of wear resistance.	AC3000
	AC630M	89.5	2.7	Super FF Coat	5	Superior performance in continuous and light cutting, and other low-speed applications that require sharp edges.	AC230
M Stainless Steel	AC610M	91.0	2.2	Super FF Coat	5	A high efficiency M10 grade featuring improved wear resistance during stainless steel cutting. Employs special, ultra-hard substrate and thin Super FF Coat.	—
	AC6030M	90.0	2.7	Absotech Coat	5	A general purpose grade featuring improved wear and fracture resistance during stainless steel cutting. Utilises a special tough carbide substrate with our patented Absotech Coat.	AC630M
K Cast Iron	AC405K	92.0	2.4	Super FF Coat	18	Employs an ultra-hard substrate and ultra-hard Super FF Coating to provide excellent resistance to wear and plastic deformation. Suitable for high-speed continuous cutting of cast iron.	AC410K
	AC415K	91.1	2.5	Super FF Coat	18	Employs a special dedicated ultra-hard substrate that is also suitable for interrupted cutting and ultra-hard Super FF Coating to provide stability and long tool life in a wide range of processes. First recommended grade for cast iron turning.	AC410K
	AC420K	91.1	2.5	Super FF Coat	12	A new, extremely versatile grade that can be used for rough, interrupted cutting of ductile and grey cast iron. Employs special, ultra-hard carbide substrate and Super FF Coat to provide stability and long tool life.	AC700G
	AC820P	90.1	2.2	Super FF Coat	14	A grade suited to heavy interrupted cutting of ductile cast iron.	AC2000

PVD Coated Grades


Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P Steel	T1500Z (Cermet)	92.0	2.2	Brilliant Coat	3	• Brilliant Coat PVD coating gives excellent lubricity for higher quality machining. General-purpose coated cermet grade that can maintain high-quality machined surfaces and also gives excellent wear resistance.	T2000Z
	T3000Z (Cermet)	91.3	2.4	ZX Coat	3	• An ultra-reliable coating grade with tough cermet substrate.	—
	AC530U	91.4	3.3	Super ZX Coat	3	• For interrupted and general steel cutting. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers, coupled with a fine-grained super tough substrate for excellent fracture resistance.	ACZ310
	AC520U	91.7	3.0	Super ZX Coat	3	• Interrupted machining and stainless steel machining. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers, coupled with a super tough substrate for excellent fracture resistance.	EH520Z EH20Z
M Stainless Steel	AC6040M	91.4	3.8	Absotech Coat	3	• Heavy interrupted machining and stainless steel machining. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers, coupled with a fine-grained super tough substrate for excellent fracture resistance.	ACZ310 AC530U
K Cast Iron	AC510U	92.6	2.6	Super ZX Coat	3	• General to interrupted machining of cast iron and ductile cast iron. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers, coupled with a fine-grained super tough substrate for excellent fracture resistance.	EH510Z EH10Z
S Exotic Alloy	AC510U	92.6	2.6	Super ZX Coat	3	• Finishing to medium cutting of exotic alloys. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers. Superior wear and heat resistance, and stable, long tool life.	EH510Z EH10Z
	AC520U	91.7	3.0	Super ZX Coat	3	• Medium to rough cutting of exotic alloys. • Utilizing the new super multi-layered PVD coating of nanometer thick TiAlN and AlCrN layers. Superior wear and heat resistance, and stable, long tool life even in interrupted cutting.	EH520Z EH20Z
Small Product Machining	ACZ150	91.4	3.3	ZX Coat	1	• For small tools, and high-precision finishing to general finishing applications. • TiN ultra-thin coating and fine-grained, super tough substrate combine to give good edge sharpness and superior cut finish.	—








Ceramic Grades For Turning

Class	Grade	Hardness (HRA)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Characteristics
 K Cast Iron	SN2000K	94.9	1.2	—	—	Contains Si ₃ N ₄ . Suitable for medium to finishing of cast iron.
 S Exotic Alloy	WX2000	90.0	1.2	—	—	Enhanced with SiC whiskers. For heat-resistant alloy and ultra-hard roll cutting.
 H Hardened Steel	NB90S	95.0	1.0	TiAlN	2	Ultra-strong. Contains Al ₂ O ₃ and ZX Coat. Continuous low-speed turning of hardened steel.



Ceramic Grades For Milling

Class	Grade	Hardness (HRA)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Characteristics
 K Cast Iron	SN2100K	93.2	0.7	—	—	Contains Si ₃ N ₄ . For high speed finish milling of cast iron.

Uncoated Carbide Grades


Application	Grade	Hardness (HRA)	TRS (GPa)	Young Modulus (GPa)	Thermal Conductivity (W/m·°C)	Compressive Strength (GPa)	Linear-Thermal Expansion Coefficient (X 10 ⁻⁶ /°C)
 P Steel	A30N	91.2	2.2	520	-	-	-
 M Stainless Steel	EH510	92.6	2.6	-	-	-	-
	EH520	91.7	3.0	-	-	-	-
 K Cast Iron	BL130	94.3	2.9	-	-	-	-
	H1	92.9	2.1	650	109	6.1	4.7
	EH10	92.4	3.4	640	105	-	4.5
	EH510	92.6	2.6	-	-	-	-
	EH520	91.7	3.0	-	-	-	-
	G10E	91.1	2.2	620	105	5.7	-
 N Non-Ferrous Metal	H1	92.9	2.1	650	109	6.1	4.7
 S Exotic Alloy	EH510	92.6	2.6	-	-	-	-
	EH520	91.7	3.0	-	-	-	-

CBN Grades



Class	Grade	Binder	Carbon Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Series	Characteristics	
	BNC2010	TiCN	50 to 55	2	30 to 32	1.10 to 1.20	Coated SUMIBORON (Coated)	Highly wear resistant coating makes this grade suited for high speed finishing.	
	BNC2020	TiN	70 to 75	5	34 to 36	1.20 to 1.30		High crater wear and breakage resistance make this grade suited for high load and interrupted cutting.	
	BNC100	TiN	40 to 45	1	29 to 32	1.05 to 1.15		Highly wear resistant coating makes this grade suited for high speed finishing.	
	BNC160	TiN	60 to 65	3	31 to 33	1.10 to 1.20		Stable, high precision finishing of hardened steel.	
	BNC200	TiN	65 to 70	4	34 to 36	1.15 to 1.25		Tough substrate with high wear resistant coating provide longer tool life.	
	BNC300	TiN	60 to 65	1	33 to 35	1.15 to 1.25		Suited for finishing when there is a combination of continuous and interrupted cutting.	
	Sintered Components	BNX10	TiCN	40 to 45	3	27 to 31	0.80 to 0.90	SUMIBORON (Uncoated)	Optimum wear resistance. Suited to continuous, high-speed cutting.
		BN1000	TiCN	40 to 45	1	27 to 31	0.90 to 1.00		Ultimate wear and fracture resistance. Suited to high-speed cutting.
		BNX20	TiN	55 to 60	3	31 to 33	0.95 to 1.10		Crater resistant grade, suitable for high efficiency cutting under high temperature conditions.
		BNX25	TiN	65 to 70	4	29 to 31	1.00 to 1.10		Excellent fracture resistance during high speed cutting. Suited to high speed interrupted cutting of hardened steel.
		BN2000	TiN	50 to 55	2	31 to 34	1.05 to 1.15		A general purpose grade for hardened steel that provides a high degree of fracture and wear resistance.
BN350		TiN	60 to 65	1	33 to 35	1.20 to 1.30	High cutting edge strength, suited to heavy interrupted cutting.		
BN7500		Co Compound	90 to 95	1	41 to 44	1.40 to 1.50	Maintains optimum cutting edge sharpness. Suited for finishing of sintered alloy.		
BN700		Co Compound	90 to 95	2	40 to 43	1.20 to 1.30	Maintains good wear and fracture resistance in rough cutting of sintered components.		
BN7000		Co Compound	90 to 95	2	41 to 44	1.30 to 1.40	Improved wear and fracture resistance in rough cutting of sintered components.		
		BN700	Co Compound	90 to 95	2	40 to 43	1.20 to 1.30		Coated SUMIBORON (Coated)
	BN7000	Co Compound	90 to 95	2	41 to 44	1.30 to 1.40	Improved wear and fracture resistance in rough cutting of cast iron and exotic alloy.		
	BNS800	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.10	100% solid CBN structure with good thermal impact resistance.		
	BNC500	TiC	60 to 65	4	32 to 34	1.00 to 1.10	Coated SUMIBORON (Coated)	Substrate with excellent wear resistance and coating makes this grade suited for hard-to-cut cast iron.	



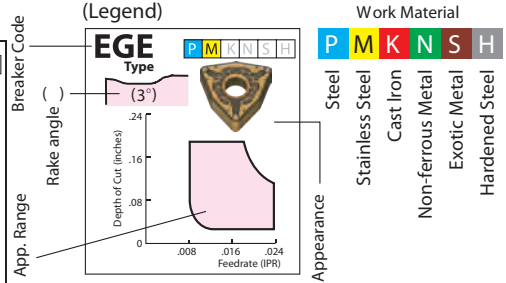
PCD Grades

Class	Grade	Binder	Carbon Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Characteristics
	DA1000	Co	90 to 95	Up to 0.5	110 to 120	≈ 2.60	High density sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and edge sharpness.
	DA2200	Co	85 to 90	0.5	90 to 100	≈ 2.45	Sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and edge sharpness.
	DA150	Co	85 to 90	5	100 to 120	≈ 1.95	Sintered material made of fine diamond particles that provides a good balance of workability and wear resistance.
	DA90	Co	90 to 95	50	100 to 120	≈ 1.10	Sintered material made of coarse diamond particles with high diamond content and excellent wear resistance.



() Bumpy breaker () Standard breaker

(Legend)



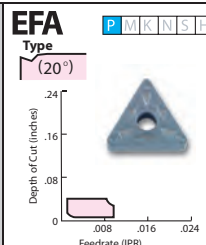
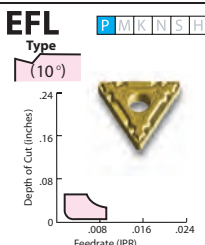
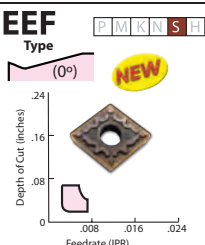
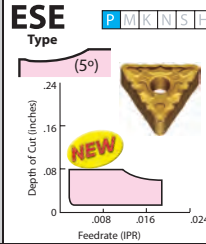
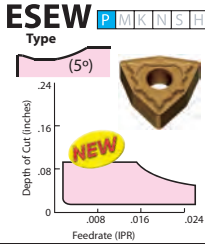
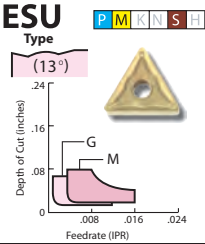
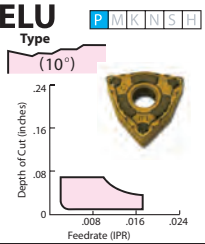
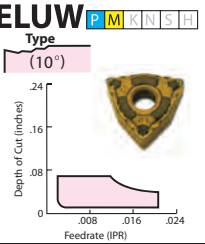
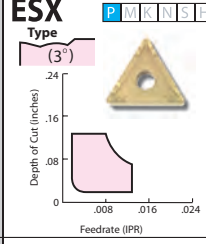
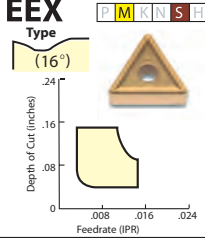
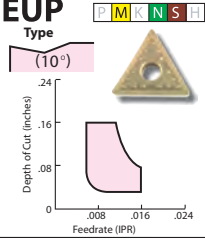

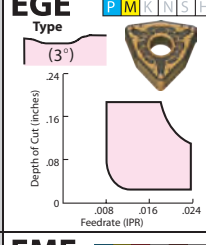
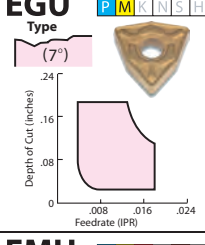
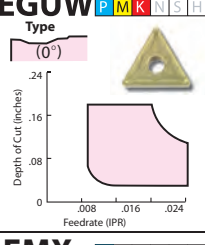
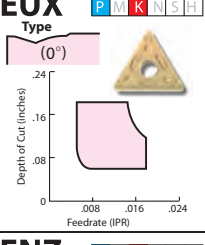
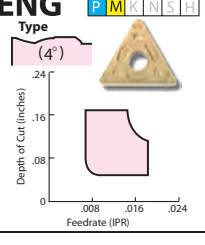
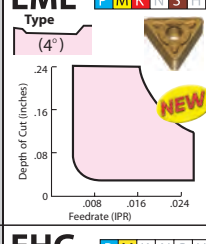
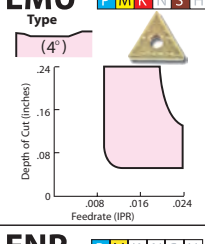
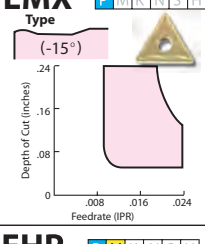
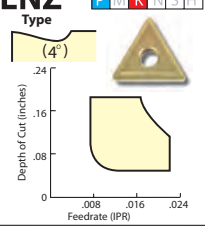

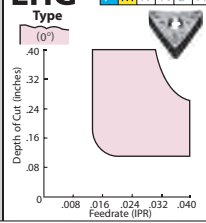
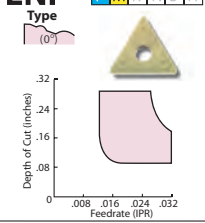
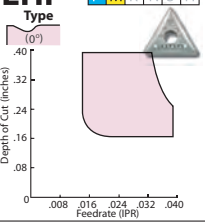
Breaker Code: **EGE** Type **P M K N S H**

Rake angle: (3°)

App. Range: Depth of Cut (inches) vs Feedrate (IPR)

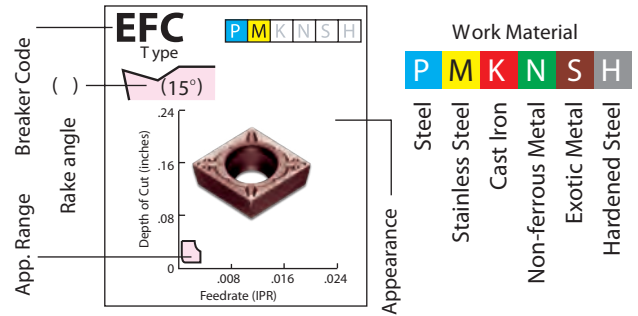
Appearance: Steel, Stainless Steel, Cast Iron, Non-ferrous Metal, Exotic Metal, Hardened Steel

Work Material: **P M K N S H**

Fine Finishing	EFA Type P M K N S H (20°) 	EFL Type P M K N S H (10°) 	EEF Type P M K N S H (0°) NEW 		
Finishing	ESE Type P M K N S H (5°) NEW 	ESEW Type P M K N S H (5°) NEW 	ESU Type P M K N S H (13°) 	ELU Type P M K N S H (10°) 	ELUW Type P M K N S H (10°) 
Light~Medium Cut	ESX Type P M K N S H (3°) 	EEX Type P M K N S H (16°) 	EUP Type P M K N S H (10°) 	EEG Type P M K N S H (0°) NEW 	
Medium Cut	EGE Type P M K N S H (3°) 	EGU Type P M K N S H (7°) 	EGUW Type P M K N S H (0°) 	EUX Type P M K N S H (0°) 	ENG Type P M K N S H (4°) 
Medium~Rough Cut	EME Type P M K N S H (4°) NEW 	EMU Type P M K N S H (4°) 	EMX Type P M K N S H (-15°) 	ENZ Type P M K N S H (4°) 	EGZ Type P M K N S H (0°) NEW 
Rough~Heavy Cut	EHG Type P M K N S H (0°) 	ENP Type P M K N S H (0°) 	EHP Type P M K N S H (0°) 		



(Legend)



() Bumpy breaker () Handed breaker

Finishing	EFB Type (20°)	EFC Type (15°)	EFP Type (10°)	EFK Type (0°)	FW Type (20°)	FX Type (15°)	FY Type (15°)		
	R/L-sd Type (0°)	R/L-sdw Type (0°)	R/L-w Type (10°)	EFM Type (6°)	ENK Type (8°)				
Finish~Light Cut									
Light Cut	ESU Type (8°)	ELU Type (12°)	ELUW Type (10°)	NAG Type (20°)	ENS Type (10°)				
Light~Medium Cut	EMU Type (0°)	ENF Type (0°)							
Rough~Heavy Cut	ESI Type (15°)								

Turning



Turning

P
Steel

Carbide Grades

Steel						
Application	High Speed			Medium		
ISO Classification	-	P05	P10	P20	P30 (M30)	P40 (M40)
COATED CARBIDE	AC810P		AC820P		AC830P	
	T1500Z					
	T3000Z					
COATED CERMET	T1500A					
CERMET						
CERAMIC						
CARBIDE	A30					

K
Cast Iron

Cast Iron				
High Speed	Finishing	Medium		
—	K01	K10	K20	K30
AC405K/		AC415K		
		AC420K/		
		AC820P/		
SN2000K				
SN2100K				
G10E				

M
Stainless Steel




Stainless Steels		
Application	Finishing~Light Cut	Medium~Roughing
COATED CARBIDE	AC610M	
	AC630M	
	AC6030M	
	AC520U	
	AC6040M	
	AC530U	
CERMET	T1500A	


S
Exotic Metal

Exotic Materials		
Application	Finishing~Light Cut	Medium
COATED CARBIDE	AC510U	
	AC520U	
	AC530U	
CARBIDE	EH510	
	EH520	
CERAMIC	WX2000	
CBN	BN7000	
	BNS800	





Ceramic Grades

For Turning	High-Speed	Finishing to Light		Medium	Rough to Heavy	
	—	01	10	20	30	40
	SN200K					
	WX2000					
	NB90S					

For Milling	High-Speed	Finishing to Light		Medium	Rough to Heavy	
	—	01	10	20	30	40
	SN2100K					

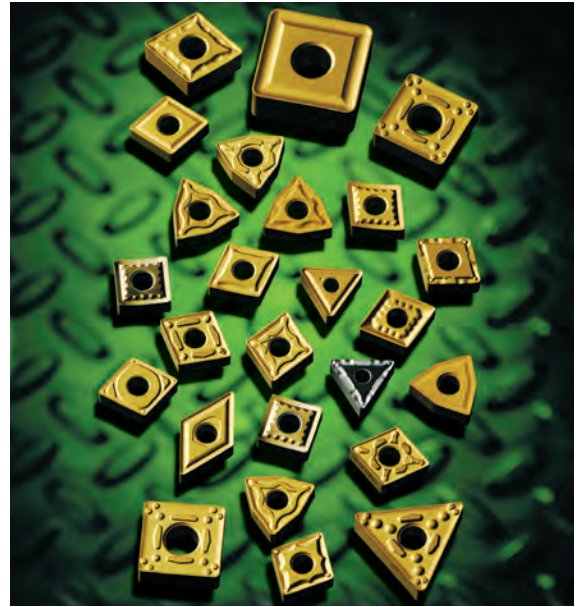
CBN Grades

Class	Series	Finishing to Light		Medium	Rough to Heavy
		H01	H10	H20	H30
	Classification				
	Coated SUMIBORON	BNC2010		BNC2020	
		BNC100	BNC160		
		BNC200		BNC300	
		BNX10,BN1000			
	Uncoated SUMIBORON	BN2000			
		BNX20	BNX25,BN350		
Sintered Components	Classification	01	10	20	30
	Uncoated SUMIBORON	BN7000, BN700			
		BN7500			
	Classification	K01	K10	K20	K30
	Coated SUMIBORON	BNC500			
		BN7000,BN700			
	Uncoated SUMIBORON	BN7500			
BNS800					



INDEXABLE INSERTS

Pages 16-124



Negative
Inserts

INDEXABLE INSERTS	PAGES
Negative Inserts	16-77
Positive Inserts	78 -121
Swiss Tooling Inserts.....	122 - 124

80° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

CC

80° Diamond Type

7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

CCGT FX		Rake Angle: 15°	Cutting Conditions:					Coated		Cermet				Uncoated																																										
			Continuous Cut					●		●	●	●	●																																											
			Medium Cut					●		●	●	●	●																																											
			Interrupted Cut					●			●	●																																												
				<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">AC530U</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">T1500Z</td> <td style="text-align: center;">T2000Z</td> <td style="text-align: center;">T1500A</td> <td style="text-align: center;">T1200A</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																																	AC530U										T1500Z	T2000Z	T1500A	T1200A						
AC530U										T1500Z	T2000Z	T1500A	T1200A																																											
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																																																			
CCGT21.5.001RFX	CCGT0602003R-FX			.0012																																																				
CCGT21.5.001LFX	CCGT0602003L-FX			.0012																																																				
CCGT21.50RFX	CCGT060201R-FX			.0039																																																				
CCGT21.50LFX	CCGT060201L-FX			.0039																																																				
CCGT21.50.5RFX	CCGT060202R-FX	.250	.094	.0078	.110																																																			
CCGT21.50.5LFX	CCGT060202L-FX			.0078																																																				
CCGT21.51RFX	CCGT060204R-FX			.0156																																																				
CCGT21.51LFX	CCGT060204L-FX			.0156																																																				
CCGT32.5.001RFX	CCGT09T3003R-FX			.0012																																																				
CCGT32.5.001LFX	CCGT09T3003L-FX			.0012																																																				
CCGT32.50RFX	CCGT09T301R-FX			.0039																																																				
CCGT32.50LFX	CCGT09T301L-FX			.0039																																																				
CCGT32.50.5RFX	CCGT09T302R-FX	.375	.156	.0078	.1732																																																			
CCGT32.50.5LFX	CCGT09T302L-FX			.0078																																																				
CCGT32.51RFX	CCGT09T304R-FX			.0156																																																				
CCGT32.51LFX	CCGT09T304L-FX			.0156																																																				

CCGT EFM		Rake Angle: 6°	Cutting Conditions:					Coated		Cermet				Uncoated																																										
			Continuous Cut					●		●	●	●	●																																											
			Medium Cut					●		●	●	●	●																																											
			Interrupted Cut					●			●	●																																												
				<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">AC530U</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">T1500Z</td> <td style="text-align: center;">T2000Z</td> <td style="text-align: center;">T1500A</td> <td style="text-align: center;">T1200A</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																																	AC530U										T1500Z	T2000Z	T1500A	T1200A						
AC530U										T1500Z	T2000Z	T1500A	T1200A																																											
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																																																			
CCGT21.5.001EFM	CCGT0602003N-SC			.0012																																																				
CCGT21.50EFM	CCGT060201N-SC			.0039																																																				
CCGT21.50MEFM	CCGT060201MN-SC			.0039																																																				
CCGT21.50.5EFM	CCGT060202N-SC			.0078																																																				
CCGT21.50.5MEFM	CCGT060202MN-SC			.0078																																																				
CCGT2.51.50EFM	CCGT080201N-SC			.0039																																																				
CCGT2.51.50.5EFM	CCGT080202N-SC	.3125		.0078	.134																																																			
CCGT32.5.001EFM	CCGT09T3003N-SC			.0012																																																				
CCGT32.50EFM	CCGT09T301N-SC			.0039																																																				
CCGT32.50MEFM	CCGT09T301MN-SC			.0039																																																				
CCGT32.50.5EFM	CCGT09T302N-SC	.375	.156	.0078	.1732																																																			
CCGT32.50.5MEFM	CCGT09T302MN-SC			.0078																																																				

M = Negative nose radius tolerance (-0.0001" to -0.0004")



CC

- 80° Diamond Type
- 7° Relief
- With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

CCGT NAG		Rake Angle: 20°	Cutting Conditions:				Coated	Cermet	Uncoated					
			Continuous Cut											
			Medium Cut											
			Interrupted Cut											
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
CCGT21.51NAG	CCGT060204N-AG	.250	.094	.0156	.110									
CCGT32.51NAG	CCGT09T304N-AG	.375	.156	.0156	.1732									
CCGT32.52NAG	CCGT09T308N-AG			.0078										

CCGT EFC		Rake Angle: 15°	Cutting Conditions:				Coated	Cermet	Uncoated				
			Continuous Cut				●	●					
			Medium Cut				●	●					
			Interrupted Cut				●	●					
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1								
CCGT21.50EFC	CCGT060201N-FC			.0039									
CCGT21.50MEFC	CCGT060201MN-FC			.0039									
CCGT21.50.5EFC	CCGT060202N-FC	.250	.094	.0078	.110								
CCGT21.50.5MEFC	CCGT060202MN-FC			.0078									
CCGT21.51EFC	CCGT060204N-FC			.0156									
CCGT21.51MEFC	CCGT060204MN-FC			.0156									
CCGT32.5.001EFC	CCGT09T3003N-FC			.0012									
CCGT32.50EFC	CCGT09T301N-FC			.0039									
CCGT32.50MEFC	CCGT09T301MN-FC			.0039									
CCGT32.50.5EFC	CCGT09T302N-FC	.375	.156	.0078	.1732								
CCGT32.50.5MEFC	CCGT09T302MN-FC			.0078									
CCGT32.51EFC	CCGT09T304N-FC			.0156									
CCGT32.51MEFC	CCGT09T304MN-FC			.0156									

M = Negative nose radius tolerance (-0.0001" to -0.0004")

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling



80° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

CC

80° Diamond Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

CCGT ESI

Rake Angle: 15°



Cutting Conditions:

Continuous Cut

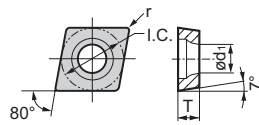
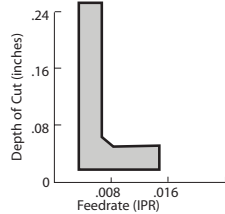
Medium Cut

Interrupted Cut

Coated

Cermet

Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	AC610M	AC6030M	AC6040M	AC630M	AC510U	AC520U	T1500Z	T1500A
CCGT32.50MESI	CCGT09T301MN-SI			.0039		●	●	●	●	●	●	●	●	●
CCGT32.50.5MESI	CCGT09T302MN-SI	.375	.156	.0078	.1372	●	●	○	○	●	●	●	●	●
CCGT32.51MESI	CCGT09T304MN-SI			.0156		●	●	○	○	●	●	●	●	●

M = Negative nose radius tolerance (-0.0001" to -0.0004")

CCMT EFB

Rake Angle: 20°



Cutting Conditions:

Continuous Cut

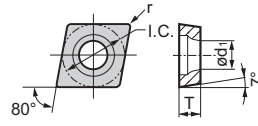
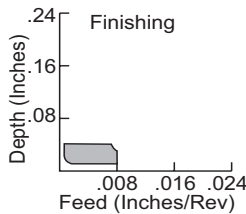
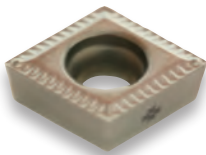
Medium Cut

Interrupted Cut

Coated

Cermet

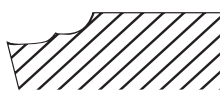
Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500Z	T1500A
CCMT21.51EFB	CCMT060204N-FB	.250	.094	.0156	.110	●	●
CCMT32.51EFB	CCMT09T304N-FB	.375	.156	.0156	.1732	●	●
CCMT32.52EFB	CCMT09T308N-FB			.0313		●	●

CCMT EFP

Rake Angle: 10°



Cutting Conditions:

Continuous Cut

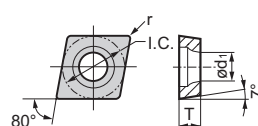
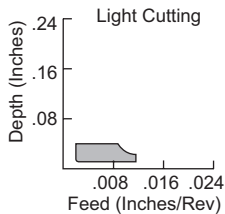
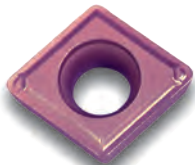
Medium Cut

Interrupted Cut

Coated

Cermet

Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T2000Z	T1500A	T1200A
CCMT21.51EFP	CCMT060204N-FP	.250	.094	.0156	.110	●	●	●
CCMT32.51EFP	CCMT09T304N-FP	.375	.156	.0156	.1732	●	●	●
CCMT32.52EFP	CCMT09T308N-FP			.0313		●	●	●



CC

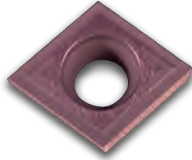
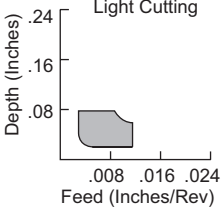
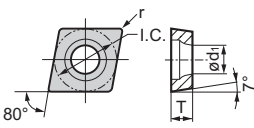
80° Diamond Type

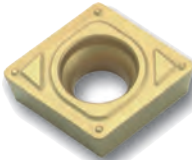
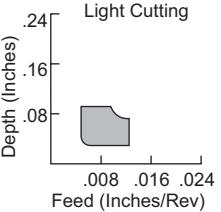
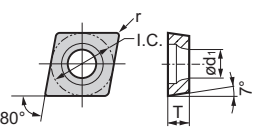
7° Relief


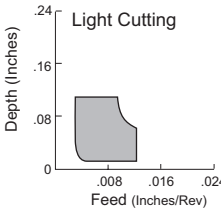
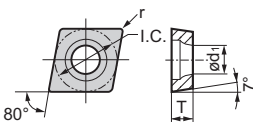
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

CCMT EFM		Rake Angle: 6°	Cutting Conditions:						Coated		Cermet		Uncoated	
			Continuous Cut	Medium Cut	Interrupted Cut									
									AC820P					
CCMT21.51EFM	CCMT060204N-SC	.250	.094	.0156	.110	●								
CCMT32.22EFM	CCMT090308N-SC	.375	.125	.0313	.1732	★								

CCMT ENK		Rake Angle: 8°	Cutting Conditions:						Coated		Cermet		Uncoated	
			Continuous Cut	Medium Cut	Interrupted Cut									
									AC820P AC830P AC700G					
CCMT21.51ENK	CCMT060204N-SK	.250	.094	.0156	.110	●	●							
CCMT21.52ENK	CCMT060208N-SK			.0313		●	●							
CCMT32.51ENK	CCMT09T304N-SK	.375	.156	.0156	.1732	●	●							
CCMT32.52ENK	CCMT09T308N-SK			.0313		●	●							
CCMT43.1ENK	CCMT120404N-SK	.500	.1875	.0156	.2165	●	●							
CCMT43.2ENK	CCMT120408N-SK			.0313		●	●							

CCMT ESU		Rake Angle: 8°	Cutting Conditions:						Coated						Cermet					
			Continuous Cut	Medium Cut	Interrupted Cut															
									AC810P AC820P AC830P AC700G AC530U AC610M AC6030M AC6040M AC630M AC405K AC410K AC415K AC420K AC510U AC520U T1500Z T2000Z T3000Z T1500A T1200A											
CCMT21.50.5ESU	CCMT060202N-SU			.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT21.51ESU	CCMT060204N-SU	.250	.094	.0156	.110	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT21.52ESU	CCMT060208N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT32.50.5ESU	CCMT09T302N-SU			.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT32.51ESU	CCMT09T304N-SU	.375	.156	.0156	.1732	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT32.52ESU	CCMT09T308N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT43.1ESU	CCMT120404N-SU	.500	.1875	.0156	.2165	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CCMT43.2ESU	CCMT120408N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	



Positive Inserts
C
D
R
S
T
V
W
Swiss Tooling

80° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

CC


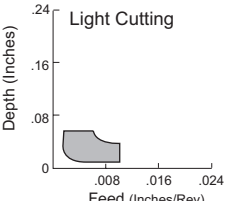
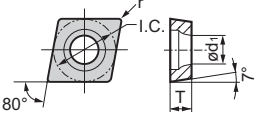
80° Diamond Type


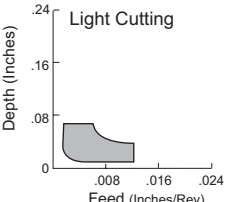
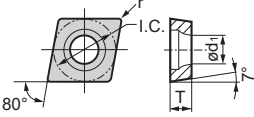
7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

CCMT ELU		Rake Angle: 12°	Cutting Conditions:						Coated			Cermet			Uncoated			
																		
																		
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC6030M	AC6040M	AC630M	T1500Z	T2000Z	T3000Z				
CCMT21.50.5ELU	CCMT060202N-LU	.250	.094	.0078	.110	●	●	●	●	●	●	●	●	●				
CCMT21.51ELU	CCMT060204N-LU			.0156		●	●	●	●	●	●	●	●	●				
CCMT32.51ELU	CCMT09T304N-LU			.0156		○	○	○	○	○	○	○	○	○				
CCMT32.52ELU	CCMT09T308N-LU	.375	.156	.0313	.1732	●	●	●	●	●	●	●	●	●				

CCMT ELUW Wiper Insert		Rake Angle: 12°	Cutting Conditions:						Coated			Cermet			Uncoated			
																		
																		
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC405K	AC415K	AC420K	T1500Z	T2000Z	T3000Z	T1500A			
CCMT32.51ELUW	CCMT09T304N-LUW	.375	.156	.0156	.1732	●	●	●	●	●	●	●	●	●	●			
CCMT32.52ELUW	CCMT09T308N-LUW			.0313		●	●	●	●	●	●	●	●	●	●			

- Positive Inserts
- C
- D
- R
- S
- T
- V
- W
- Swiss Tooling



CC

80° Diamond Type

7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

<h2 style="margin: 0;">CCMT</h2> <h2 style="margin: 0;">EMU</h2>		Rake Angle: 0° 	Cutting Conditions:						Coated						Cermets		Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Medium Cutting 							AC810P	AC820P	AC830P	AC700G	AC405K	AC410K	AC415K	AC420K				
			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1															
CCMT32.51EMU	CCMT09T304N-MU	.375	.156	.0156	.1732							●	●	●	●	●	●	●	●	
CCMT32.52EMU	CCMT09T308N-MU			.0313								●	●	●	●	●	●	●	●	

<h2 style="margin: 0;">CCMA</h2>		Rake Angle: 0° 	Cutting Conditions:						Coated						Cermets		Uncoated	
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●
									AC700G	AC405K	AC410K	AC415K	AC420K					
			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
CCMA21.51	CCMA060204	.250	.094	.0156	.110							●	●	●	●	●	●	●
CCMA32.51	CCMA09T304			.0156								●	●	▲	●	●	●	●
CCMA32.52	CCMA09T308	.375	.156	.0313	.1732							●	●	●	●	●	●	●

Positive Inserts

C

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Swiss Tooling



CP

80° Diamond Type

11° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

CPMT EFB		Rake Angle: 20°	Cutting Conditions:						Coated			Cermet			Uncoated				
			Continuous Cut																
			Medium Cut																
			Interrupted Cut																
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1													
CPMT2.51.51EFB		CPMT080204N-FB	.375	.125	.0313	.1732													

CPMT ENS		Rake Angle: 10°	Cutting Conditions:						Coated		Cermet			Uncoated				
			Continuous Cut						●	●								
			Medium Cut						●	●								
			Interrupted Cut						●	●								
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1												
CPMT21.51ENS		CPMT060204N-US	.250		.0156	.110			○	●								
CPMT2.51.52ENS		CPMT080208N-US	.3125	.094	.0313	.134			○	●								
CPMT322ENS		CPMT090308N-US	.375	.125	.0313	.1732			○	●								
CPMT32.52ENX		CPMT09T308N-US	.375	.156	.0156	.1732			○	●								
CPMT432ENS		CPMH120408N-US	.500	.1875	.0313	.2165			○	●								

CPMT ELU		Rake Angle: 12°	Cutting Conditions:						Coated					Cermet			Uncoated			
			Continuous Cut						●	●	●	●	●	●	●	●				
			Medium Cut						●	●	●	●	●	●	●	●	●			
			Interrupted Cut						●	●	●	●	●		●					
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1														
CPMT321ELU		CPMT090304N-LU	.375	.125	.0156	.1732								★	●					
CPMT322ELU		CPMT090308N-LU			.0313									★	●	●				



Positive Inserts

C

D

R

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Swiss Tooling

80° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

CP 80° Diamond Type
11° Relief
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

CPMT ESU		Rake Angle: 8°	Cutting Conditions:						Cermets					UC									
			Continuous Cut						●	●	●	●	●	●	●	●	●	●	●				
			Medium Cut						●	●	●	●	●	●	●	●	●	●	●				
			Interrupted Cut						●	●	●	●	●	●	●	●	●	●	●				
									AC810P	AC820P	AC830P	AC700G	AC610M	AC6030M	AC6040M	AC630M	AC510U	AC520U	T1500Z	T2000Z	T3000Z	T1500A	T1200A
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																		
CPMT21.51ESU	CPMT060204N-SU	.250		.0156	.110	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CPMT21.52ESU	CPMT060208N-SU		.094	.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CPMT2.51.51ESU	CPMT080204N-SU	.3125		.0156	.134	★	●	★	●	●	○	○	○	●	●	●	●	●	●	●	●	●	
CPMT2.51.52ESU	CPMT080208N-SU			.0313		★	●	★	●	●	○	○	○	●	●	●	●	●	●	●	●	●	
CPMT321ESU	CPMT090304N-SU		.125	.0156	.1732	●	●	●	●	●	○	○	○	●	●	●	●	★	●	●	●	●	
CPMT322ESU	CPMT090308N-SU			.0313		●	●	●	●	●	○	○	○	●	●	●	●	●	●	●	●	●	
CPMT32.51ESU	CPMT09T304N-SU	.375		.0156		●	●	●	●	●	○	○	○	●	●	●	●	●	●	●	●	●	
CPMT32.52ESU	CPMT09T308N-SU		.156	.0313		●	●	●	●	●	○	○	○	●	●	●	●	●	●	●	●	●	

CPMT EMU		Rake Angle: 0°	Cutting Conditions:						Coated						Cermets		Uncoated						
			Continuous Cut						●	●	●	●	●	●	●	●	●	●	●	●	●	●	
			Medium Cut						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Interrupted Cut						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
									AC810P	AC820P	AC700G	AC410K	AC415K	AC420K									
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																		
CPMT2.51.51EMU	CPMT080204N-MU	.3125	.094	.0156	.134	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CPMT2.51.52EMU	CPMT080208N-MU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CPMT321EMU	CPMT090304N-MU		.125	.0156	.1732	★	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CPMT322EMU	CPMT090308N-MU			.0313		★	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	



CP



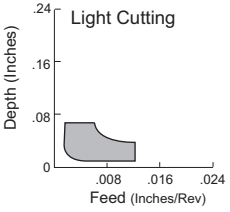
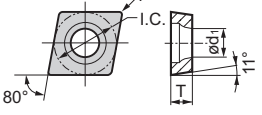
80° Diamond Type




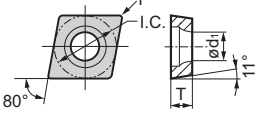
11° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

CPMT ELUW Wiper Insert		Rake Angle: 12°		Cutting Conditions:						Coated				Cermet			Uncoated								
				Continuous Cut Medium Cut Interrupted Cut																					
										AC810P				AC820P				AC700G							
										T1500Z				T2000Z				T3000Z							
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1	AC810P	AC820P	AC700G					T1500Z	T2000Z	T3000Z								
CPMT321ELUW		CPMT090304N-LUW		.375	.125	.0156	.1732	★	★	●					★	●	●								
CPMT322ELUW		CPMT090308N-LUW				.0313		★	★	●					★	●	●								

CPMA 		Rake Angle: 0°		Cutting Conditions:						Coated				Cermet			Uncoated								
				Continuous Cut Medium Cut Interrupted Cut																					
										AC700G				AC410K				AC415K				AC420K			
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1	AC700G	AC410K	AC415K	AC420K														
CPMA2.51.51		CPMA080204		.3125	.094	.0156	.134																		
CPMA2.51.52		CPMA080208				.0313																			
CPMA321		CPMA090304		.375	.125	.0156	.1732	★	▲	●	●														
CPMA322		CPMA090308				.0313				●	●														



Positive Inserts

C

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Swiss Tooling

55° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

DC

55° Diamond Type

7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DCGT FX		Rake Angle: 15°	Cutting Conditions:				Coated		Cermet		Uncoated																																																			
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Continuous Cut</td> <td style="text-align: center; width: 15px;">●</td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> </tr> <tr> <td style="padding: 2px;">Medium Cut</td> <td style="text-align: center;">●</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">Interrupted Cut</td> <td style="text-align: center;">●</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table>				Continuous Cut	●													Medium Cut	●													Interrupted Cut	●																			AC530U		T1 500A T1 200A					
Continuous Cut	●																																																													
Medium Cut	●																																																													
Interrupted Cut	●																																																													
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	●	●	●	●	●	●	●	●	●																																																
DCGT21.5.001RFX	DCGT0702003R-FX			.0012		●																																																								
DCGT21.5.001LFX	DCGT0702003L-FX			.0012		★																																																								
DCGT21.50 RFX	DCGT070201R-FX	.250	.094	.0039	.110	★																																																								
DCGT21.50LFX	DCGT070201L-FX			.0039		●																																																								
DCGT21.50.5RFX	DCGT070202R-FX			.0078		●																																																								
DCGT21.50.5LFX	DCGT070202L-FX			.0078		★																																																								
DCGT32.5.001RFX	DCGT11T3003R-FX			.0012		★																																																								
DCGT32.5.001LFX	DCGT11T3003L-FX			.0012		★																																																								
DCGT32.50RFX	DCGT11T301R-FX	.375	.156	.0039	.1732	★																																																								
DCGT32.50LFX	DCGT11T301L-FX			.0039		★																																																								
DCGT32.50.5RFX	DCGT11T302R-FX			.0078		★																																																								
DCGT32.50.5LFX	DCGT11T302L-FX			.0078		★																																																								

DCGT FY		Rake Angle: 15°	Cutting Conditions:				Coated		Cermet		Uncoated																																																			
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Continuous Cut</td> <td style="text-align: center; width: 15px;">●</td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> <td style="text-align: center; width: 15px;"></td> </tr> <tr> <td style="padding: 2px;">Medium Cut</td> <td style="text-align: center;">●</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">Interrupted Cut</td> <td style="text-align: center;">●</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table>				Continuous Cut	●													Medium Cut	●													Interrupted Cut	●																			AC530U							
Continuous Cut	●																																																													
Medium Cut	●																																																													
Interrupted Cut	●																																																													
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	●	●	●	●	●	●	●	●	●																																																
DCGT21.51RFX	DCGT070204L-FY	.250	.094	.0156	.110	★																																																								
DCGT21.51LFX	DCGT070204L-FY			.0156		★																																																								
DCGT32.51LFX	DCGT11T304L-FY	.375	.156	.0156	.1732	★																																																								



DC


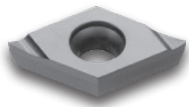
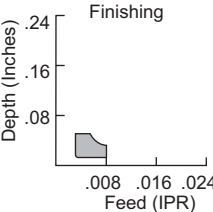
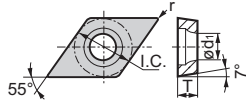
55° Diamond Type


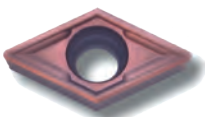
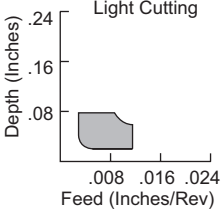
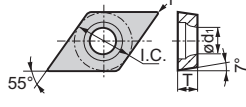
7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DCGT		Rake Angle: 10°	Cutting Conditions:				Coated	Cermet		Uncoated				
W			Continuous Cut				●	●						
			Medium Cut				●	●						
			Interrupted Cut				●	●						
		<p>Finishing</p>  <p>Depth (Inches)</p> <p>Feed (IPR)</p>					<p>T1500A</p> <p>T1200A</p>							
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
DCGT21.50.5R	DCGT070202R-W	.250	.094	.0078	.110	★	●							
DCGT21.50.5L	DCGT070202L-W			.0078		★	●							
DCGT21.51R	DCGT070204R-W			.0156		★	●							
DCGT21.51L	DCGT070204L-W			.0156		★	●							
DCGT32.51R	DCGT11T304R-W	.375	.156	.0156	.1732	★	●							
DCGT32.51L	DCGT11T304L-W			.0156		★	●							
DCGT32.52R	DCGT11T308R-W			.0313		★	●							
DCGT32.52L	DCGT11T308L-W			.0313		★	●							

DCGT		Rake Angle: 6°	Cutting Conditions:				Coated	Cermet		Uncoated						
EFM			Continuous Cut				●	●	●							
			Medium Cut				●	●	●							
			Interrupted Cut				●	●	●							
		<p>Light Cutting</p>  <p>Depth (Inches)</p> <p>Feed (Inches/Rev)</p>					<p>AC530U</p>		<p>T1500Z</p> <p>T2000Z</p> <p>T3000Z</p> <p>V000A</p> <p>T1200A</p>							
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1											
DCGT21.5.001EFM	DCGT0702003N-SC	.250	.094	.0012	.110	★	●	●	●							
DCGT21.50EFM	DCGT070201N-SC			.0039		●	●	●								
DCGT21.50MEFM	DCGT070201MN-SC			.0039		●	●	●								
DCGT21.50.5EFM	DCGT070202N-SC			.0078		●	●	●								
DCGT21.50.5MEFM	DCGT070202MN-SC	.3125	.134	.0078	.134	●	●	●	●							
DCGT21.51EFM	DCGT070204N-SC			.0156		●	●	●								
DCGT21.51MEFM	DCGT070204MN-SC			.0156		●	●	●								
DCGT21.52EFM	DCGT070208N-SC			.0313		●	●	●								
DCGT21.52MEFM	DCGT070208MN-SC	.375	.156	.0313	.1732	●	●	●	●							
DCGT2.51.50EFM	DCGT090201N-SC			.0039		●	●	●								
DCGT2.51.50.5EFM	DCGT090202N-SC			.0078		●	●	●								
DCGT32.5.001EFM	DCGT11T3003N-SC			.0012		★	●									
DCGT32.50EFM	DCGT11T301N-SC	.0039	●	●	●											
DCGT32.50MEFM	DCGT11T301MN-SC	.0039	●	●	●											
DCGT32.50.5EFM	DCGT11T302N-SC	.0078	●	●	●											
DCGT32.50.5MEFM	DCGT11T302MN-SC	.0078	●	●	●											
DCGT32.51EFM	DCGT11T304N-SC	.0156	●	●	●											
DCGT32.51MEFM	DCGT11T304MN-SC	.0156	●	●	●											
DCGT32.52EFM	DCGT11T308N-SC	.0313	●	●	●											
DCGT32.52MEFM	DCGT11T308MN-SC	.0313	●	●	●											

M = Negative nose radius tolerance (-0.0001" to -0.0004")



Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

55° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

DC

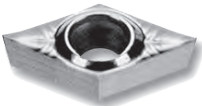

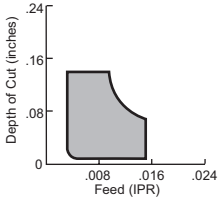
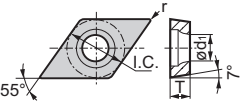
55° Diamond Type

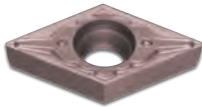

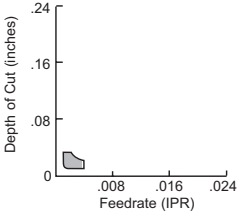
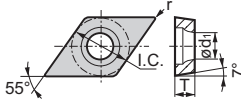
7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DCGT NAG		Rake Angle: 20°	Cutting Conditions:			Coated		Cermet		Uncoated		
			Continuous Cut							●		
			Medium Cut							●		
			Interrupted Cut									
				H1								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1							
DCGT21.50.5NAG	DCGT070202N-AG	.250	.094	.0078	.110							
DCGT21.51NAG	DCGT070204N-AG			.0156								
DCGT32.50.5NAG	DCGT11T302N-AG			.0078								
DCGT32.51NAG	DCGT11T304N-AG	.375	.156	.0156	.1732							
DCGT32.52NAG	DCGT11T308N-AG			.0313								

DCGT EFC		Rake Angle: 15°	Cutting Conditions:			Coated		Cermet		Uncoated		
			Continuous Cut			●		●				
			Medium Cut			●	●	●				
			Interrupted Cut			●	●	●				
				AC530U AC520U T1500A								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1							
DCGT21.5.001EFC	DCGT0702003N-FC			.0012								
DCGT21.50EFC	DCGT070201N-FC			.0039								
DCGT21.50MEFC	DCGT070201MN-FC	.250	.094	.0039	.110							
DCGT21.50.5EFC	DCGT070202N-FC			.0078								
DCGT21.50.5MEFC	DCGT070202MN-FC			.0078								
DCGT21.51EFC	DCGT070204N-FC			.0156								
DCGT21.51MEFC	DCGT070204MN-FC	.3125		.0156	.134							
DCGT32.5.001EFC	DCGT11T3003N-FC			.0012								
DCGT32.50EFC	DCGT11T301N-FC			.0039								
DCGT32.50MEFC	DCGT11T301MN-FC			.0039								
DCGT32.50.5EFC	DCGT11T302N-FC	.375	.156	.0078	.1732							
DCGT32.50.5MEFC	DCGT11T302MN-FC			.0078								
DCGT32.51EFC	DCGT11T304N-FC			.0156								
DCGT32.51MEFC	DCGT11T304N-FC			.0156								

M = Negative nose radius tolerance (-0.0001" to -0.0004")



DC

55° Diamond Type

7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DCGT ESI		Rake Angle: 15°	Cutting Conditions:						Coated				Cermet		Uncoated								
			Continuous Cut						●	●	●	●	●	●	●	●							
			Medium Cut						●	●	●	●	●	●	●	●	●						
			Interrupted Cut						●	●	●	●	●	●	●								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																		
DCGT21.50MESI	DCGT070201MN-SI			.0039		●	●	●	●	●	●	●	●										
DCGT21.50.5MESI	DCGT070202MN-SI	.250	.094	.0078	.110	●	●	●	●	●	●	●	●										
DCGT21.51MESI	DCGT070204MN-SI			.0156		●	●	●	●	●	●	●	●										
DCGT32.50MESI	DCGT11T301MN-SI			.0039		●	●	●	●	●	●	●	●										
DCGT32.50.5MESI	DCGT11T302MN-SI	.375	.156	.0078	.1732	●	●	●	●	●	●	●	●										
DCGT32.51MESI	DCGT11T304MN-SI			.0156		●	●	●	●	●	●	●	●										
DCGT32.52MESI	DCGT11T308MN-SI			.0313		●	●	●	●	●	●	●	●										

M = Negative nose radius tolerance (-0.0001" to -0.0004")

DCMT EFB		Rake Angle: 20°	Cutting Conditions:						Coated				Cermet		Uncoated								
			Continuous Cut										●	●									
			Medium Cut											●	●								
			Interrupted Cut												●								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																		
DCMT21.50.5EFB	DCMT070202N-FB			.0078										●	●								
DCMT21.51EFB	DCMT070204N-FB	.250	.094	.0156	.110									●	●								
DCMT21.52EFB	DCMT060208N-FB			.0313										●									
DCMT32.50.5EFB	DCMT11T302N-FB	.375	.156	.0078	.1732									●	●								
DCMT32.52EFB	DCMT11T308N-FB			.0313										●	●								



Positive Inserts



Swiss Tooling

55° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

DC

55° Diamond Type

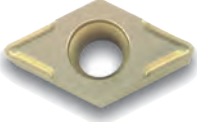
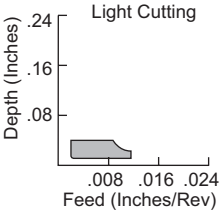
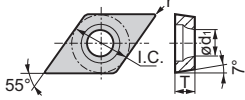
7° Relief

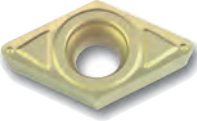
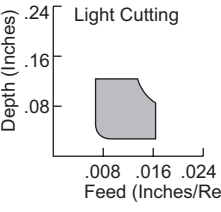
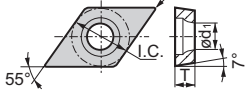
With Insert Hole

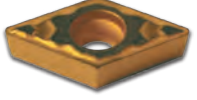
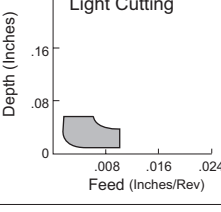
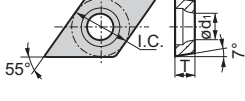
- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

- Positive Inserts
- C
- D
- R
- S
- T
- V
- W
- Swiss Tooling

DCMT EFP		Rake Angle: 10°	Cutting Conditions:				Coated		Cermet		Uncoated							
			Continuous Cut	Medium Cut	Interrupted Cut													
									●	●								
									●	●								
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1			T1500A	T1200A								
DCMT21.50.5EFP		DCMT070202N-FP	.250	.094	.0078	.110			●	●								
DCMT21.51EFP		DCMT070204N-FP			.0156				●	●								
DCMT32.51EFP		DCMT11T304N-FP			.0156				●	●								
DCMT32.52EFP		DCMT11T308N-FP	.375	.156	.0313	.1732			●	●								

DCMT ENK		Rake Angle: 8°	Cutting Conditions:				Coated		Cermet		Uncoated							
			Continuous Cut	Medium Cut	Interrupted Cut													
							●											
							●	●										
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1	AC820P	AC830P										
DCMT21.51ENK		DCMT070204N-SK	.250	.094	.0156	.110	●	●										
DCMT32.51ENK		DCMT11T304N-SK			.0156		●	●										
DCMT32.52ENK		DCMT11T308N-SK	.375	.156	.0313	.1732	●	●										



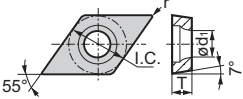
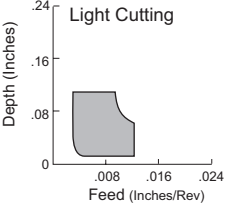
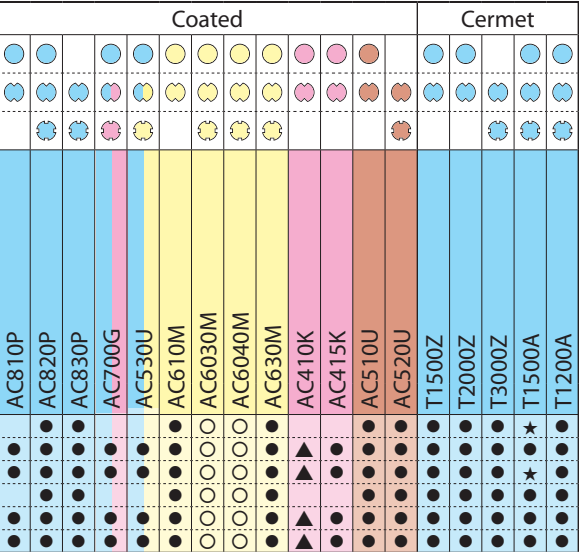
DCMT ELU		Rake Angle: 12°	Cutting Conditions:				Coated				Cermet		Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut													
							●	●	●	●	●	●	●	●				
							●	●	●	●	●	●	●	●	●	●	●	●
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC530U	AC6030M	AC6040M	AC630M	T1500Z	T2000Z	T3000Z		
DCMT21.50.5ELU		DCMT070202N-LU	.250	.094	.0078	.110	●	●	●	●	●	●	●	●	●	●	●	
DCMT21.51ELU		DCMT070204N-LU			.0156		●	●	●	●	●	●	●	●	●	●	●	
DCMT32.50.5ELU		DCMT11T302N-LU			.0078		●	●	●	●	●	●	●	●	●	●	●	
DCMT32.51ELU		DCMT11T304N-LU	.375	.156	.0156	.1732	●	●	●	●	●	●	●	●	●	●	●	
DCMT32.52ELU		DCMT11T308N-LU			.0313		●	●	●	●	●	●	●	●	●	●	●	



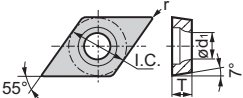
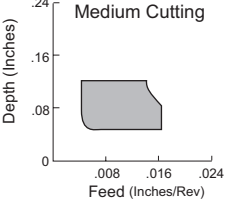
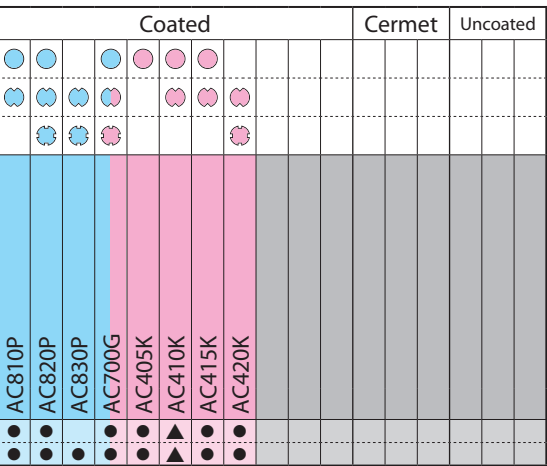


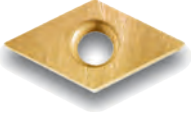

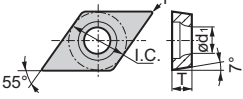
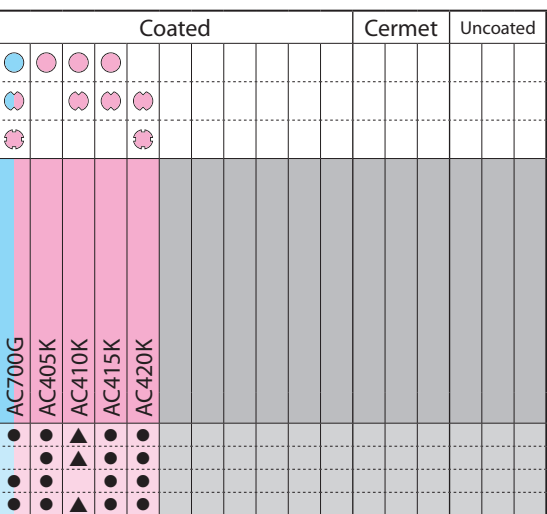
DC 55° Diamond Type
7° Relief
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DCMT ESU		Rake Angle: 8°		Cutting Conditions:		Coated										Cermet											
						Continuous Cut		Medium Cut		Interrupted Cut		AC810P	AC820P	AC830P	AC700G	AC530U	AC610M	AC6030M	AC6040M	AC630M	AC410K	AC415K	AC510U	AC520U	T1500Z	T2000Z	T3000Z
																											
		Sumitomo Catalog #	ISO Catalog #			I.C.	T	r	ød1	AC810P	AC820P	AC830P	AC700G	AC530U	AC610M	AC6030M	AC6040M	AC630M	AC410K	AC415K	AC510U	AC520U	T1500Z	T2000Z	T3000Z	T1500A	T1200A
DCMT21.50.5ESU	DCMT070202N-SU			.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
DCMT21.51ESU	DCMT070204N-SU	.250	.094	.0156	.110	●	●	●	●	●	●	●	●	●	●	▲	●	●	●	●	●	●	●	●			
DCMT21.52ESU	DCMT070208N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
DCMT32.50.5ESU	DCMT11T302N-SU			.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
DCMT32.51ESU	DCMT11T304N-SU	.375	.156	.0156	.1732	●	●	●	●	●	●	●	●	●	●	▲	●	●	●	●	●	●	●	●			
DCMT32.52ESU	DCMT11T308N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			

DCMT EMU		Rake Angle: 0°		Cutting Conditions:		Coated							Cermet	Uncoated			
						Continuous Cut		Medium Cut		Interrupted Cut		AC810P	AC820P	AC830P	AC700G	AC405K	AC410K
																	
		Sumitomo Catalog #	ISO Catalog #			I.C.	T	r	ød1	AC810P	AC820P	AC830P	AC700G	AC405K	AC410K	AC415K	AC420K
DCMT32.51EMU	DCMT11T304N-MU	.375	.156	.0156	.1732	●	●	●	●	●	▲	●	●	●			
DCMT32.52EMU	DCMT11T308N-MU			.0313		●	●	●	●	●	●	●	●	●			

DCMA		No Breaker		Cutting Conditions:		Coated					Cermet	Uncoated			
						Continuous Cut		Medium Cut		Interrupted Cut		AC700G	AC405K	AC410K	AC415K
															
		Sumitomo Catalog #	ISO Catalog #			I.C.	T	r	ød1	AC700G	AC405K	AC410K	AC415K	AC420K	
DCMA21.51	DCMA070204	.250	.094	.0156	.110	●	●	▲	●	●	●				
DCMA21.52	DCMA070208			.0313		●	●	▲	●	●	●				
DCMA32.51	DCMA11T304			.0156		●	●	●	●	●	●				
DCMA32.52	DCMA11T308	.375	.156	.0313	.1732	●	●	▲	●	●	●				



- Positive Inserts
- C
- D
- R
- S
- T
- V
- W
- Swiss Tooling

55° DIAMOND TYPE POSITIVE INSERT

Indexable Inserts for Turning

DP	55° Diamond Type
	11° Relief
	With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

DPMT ESU		Rake Angle: 8°	Cutting Conditions:						Cermet		Uncoated		
			Continuous Cut	●	●					●	●		
			Medium Cut	●	●	●				●	●		
			Interrupted Cut	●	●					●	●		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC510U	AC520U			T1500A	T1200A	
DPMT 21.51ESU	DPMT 070204N-SU	.250	.094	.0156	.110	●	●	●			●	●	
DPMT 32.51ESU	DPMT 11T304N-SU			.0156		●	●	●			●	●	
DPMT 32.52ESU	DPMT 11T308N-SU	.375	.156	.0313	.1732	●	●	●			●	●	

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

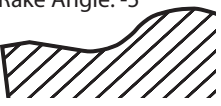

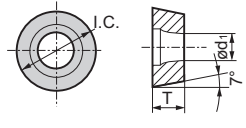



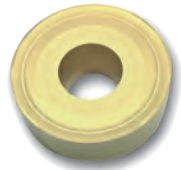
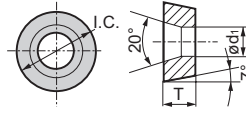
RC

Round Type
7° Relief
With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

RCMT RX		Rake Angle: -5°	Cutting Conditions:						Coated			Cermet			Uncoated		
									Continuous Cut	Medium Cut	Interrupted Cut						
									●	●	●						
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1	AC810P	AC820P	AC830P							
RCMT100300		RCMT1003M0N-RX		.394	.125		.1417	●	●	●							
RCMT120400		RCMT1204M0N-RX		.472	.1875		.1654	●	●	●							
RCMT160600		RCMT1606M0N-RX		.630	.250	-	.2047	●	●	●							
RCMT200600		RCMT2006M0N-RX		.787	.250		.2559	●	●	●							
RCMT250700		RCMT2507M0N-RX		.984	.313		.2835	●	●	●							

RCMX RP		Rake Angle: -15°	Cutting Conditions:						Coated							Uncoated				
									Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●			
									●	●	●	●	●	●	●	●	●			
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1	AC810P	AC820P	AC830P	AC700G	AC410K	AC415K	AC420K	AC510U					
RCMX100300		RCMX1003M0N-RP		.394	.125		.1417	●	●	●	●	●	●	●						
RCMX120400		RCMX1204M0N-RP		.472	.1875		.1654	●	●	●	●	▲	★	●						
RCMX160600		RCMX1606M0N-RP		.630	.250	-	.2047	●	●	●	●	▲	★	●						
RCMX200600		RCMX2006M0N-RP		.787	.250		.2559	●	●	●	●	●	●	●						
RCMX250700		RCMX2507M0N-RP		.984	.313		.2835	●	●	●	●	●	●	●						

- Positive Inserts
- C
- D
- R
- S
- T
- V
- W
- Swiss Tooling



90° SQUARE TYPE

POSITIVE INSERT

Indexable Inserts for Turning

SC

90° Square Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

SCGT FX

Rake Angle: 15°



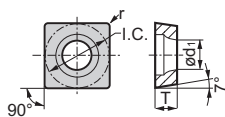
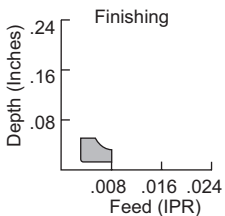
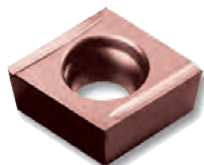
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet	Uncoated
●		
●●		
●●●		



AC530U

Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1
SCGT32.50.5RFX	SCGT09T302R-FX			.0078	
SCGT32.50.5LFX	SCGT09T302L-FX			.0078	
SCGT32.51RFX	SCGT09T304R-FX	.375	.156	.0156	.1732
SCGT32.51LFX	SCGT09T304L-FX			.0156	

SCGT EFM

Rake Angle: 6°



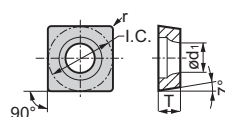
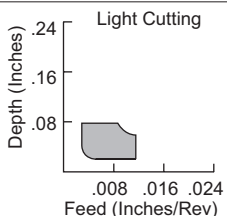
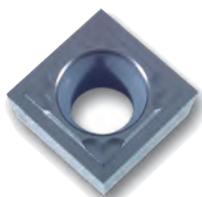
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet	Uncoated
●	●●	
●●	●●●	
●●●	●●●●	



AC530U

T1 500A
T1 200A

Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1
SCGT2.51.50EFM	SCGT070201N-SC			.0039	
SCGT2.51.50.5EFM	SCGT070202N-SC	.3125	.094	.0078	.134
SCGT32.50EFM	SCGT09T301N-SC	.375	.156	.0039	.1732
SCGT32.50.5EFM	SCGT09T302N-SC			.0078	

SCMT EFB

Rake Angle: 20°



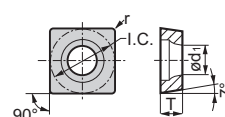
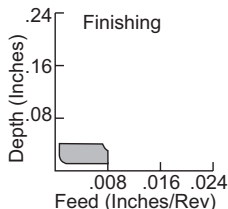
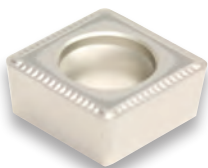
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet	Uncoated
	●●	
	●●●	
	●●●●	



T1 500Z
T1 500A

Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1
SCMT32.51EFB	SCMT09T304N-FB			.0156	
SCMT32.52EFB	SCMT09T308N-FB	.375	.156	.0313	.1732



SC

90° Square Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving January 2015

SCMT		Rake Angle: 10°	Cutting Conditions:				Coated			Cermet			Uncoated					
EFP			Continuous Cut Medium Cut Interrupted Cut															
 Light Cutting Depth (Inches) vs Feed (Inches/Rev) graph Feed (Inches/Rev) diagram		I.C.					T	r	ød1									
Sumitomo Catalog #	ISO Catalog #																	
SCMT32.51EFP	SCMT09T304N-FP	.375	.156	.0156	.1732				●	●								
SCMT32.52EFP	SCMT09T308N-FP			.0313					●	●								

SCMT		Rake Angle: 8°	Cutting Conditions:				Coated			Cermet			Uncoated					
ENK			Continuous Cut Medium Cut Interrupted Cut															
 Light Cutting Depth (Inches) vs Feed (Inches/Rev) graph Feed (Inches/Rev) diagram		I.C.					T	r	ød1									
Sumitomo Catalog #	ISO Catalog #																	
SCMT32.51ENK	SCMT09T304N-SK	.375	.156	.0156	.1732				●	●								
SCMT32.52ENK	SCMT09T308N-SK			.0313					●	●								
SCMT431ENK	SCMT120404N-SK			.0156					●	●								
SCMT432ENK	SCMT120408N-SK	.500	.1875	.0313	.2165				●	●								
SCMT433ENK	SCMT120412N-SK			.0469					●	●								

SCMT		Rake Angle: 8°	Cutting Conditions:				Coated						Cermet		Uncoated				
ESU			Continuous Cut Medium Cut Interrupted Cut																
 Light Cutting Depth (Inches) vs Feed (Inches/Rev) graph Feed (Inches/Rev) diagram		I.C.					T	r	ød1										
Sumitomo Catalog #	ISO Catalog #																		
SCMT32.51ESU	SCMT09T304N-SU	.375	.156	.0156	.1732							●	●						
SCMT32.52ESU	SCMT09T308N-SU			.0313								●	●						
SCMT431ESU	SCMT120404N-SU			.0156								●	●						
SCMT432ESU	SCMT120408N-SU	.500	.1875	.0313	.2165							●	●						



Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

90° SQUARE TYPE

POSITIVE INSERT

Indexable Inserts for Turning

SC

90° Square Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

Positive Inserts

C

D

R

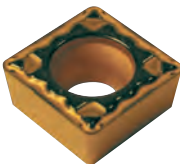

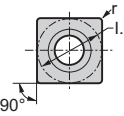
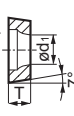
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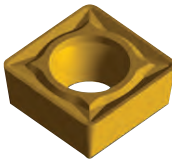
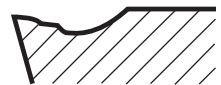
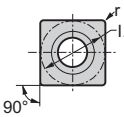
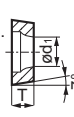
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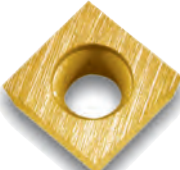

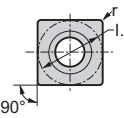
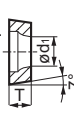
V

W

Swiss Tooling

SCMT ELU		Rake Angle: 12°	Cutting Conditions:						Coated			Cermet			Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC6030M	AC6040M	AC630M				T1500Z	T2000Z	T3000Z	
SCMT32.51ELU	SCMT09T304N-LU	.375	.156	.0156	.1732	●	●	●	○	○	●				●	●	●	
SCMT32.52ELU	SCMT09T308N-LU			.0313		●	●	●	○	○	●							

SCMT EMU		Rake Angle: 0°	Cutting Conditions:						Coated			Cermet			Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC405K	AC415K	AC420K							
SCMT32.52EMU	SCMT09T308N-MU	.375	.156	.0313	.1732	★	●	●	★	★	●							
SCMT432EMU	SCMT120408N-MU	.500	.1875	.0313	.2165	★	★	★	★	★	●							

SCMA		No Breaker	Cutting Conditions:						Coated			Cermet			Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC700G	AC420K											
SCMA32.52	SCMA09T308	.375	.156	.0313	.1732	●	●											
SCMA432	SCMA120408	.500	.1875	.0313	.2165	★	●											
SCMA433	SCMA120412			.0469		★	●											



SP

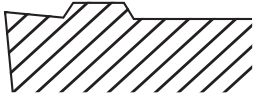

90° Square Type



11° Relief


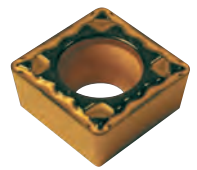
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

SPMT ENS		Rake Angle: 10° 	Cutting Conditions:				Coated			Cermet			Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	AC6030M	AC6040M	AC630M										
		Light Cutting Depth (Inches) vs Feed (Inches/Rev) graph I.C., T, r, ød1 diagrams																
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
SPMT21.51ENS	SPMT060204N-US	.250	.094	.0156	.1102	○	○	○										
SPMT2.522ENS	SPMT070308N-US	.3125	.125	.0313	.134	○	○	●										
SPMT322ENS	SPMT090308N-US	.375	.125	.0313	.130	○	○	●										
SPMT32.52ENX	SPMT09T308N-US	.375	.156	0.313	.1732	○	○	●										
SPMT432ENS	SPMT120408N-US	.500	.1875	.0313	.2165	○	○	●										

SPMT EFK		Rake Angle: 0° 	Cutting Conditions:				Coated			Cermet			Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	T1500Z	T2000Z	T1500A	T1200A									
		Light Cutting Depth (Inches) vs Feed (Inches/Rev) graph I.C., T, r, ød1 diagrams																
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
SPMT321EFK	SPMT090304N-FK	.375	.125	.0156	.130				●	●	●	●						
SPMT322EFK	SPMT090308N-FK			.0313					●	●	●	●						

SPMT ELU		Rake Angle: 12° 	Cutting Conditions:				Coated			Cermet			Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	AC810P	AC820P	AC700G	AC6030M	AC6040M	AC630M							
		Light Cutting I.C., T, r, ød1 diagrams																
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
SPMT321ELU	SPMT090304N-LU	.375	.125	.0156	.130	★	★	●	○	○	○	○	○	○				
SPMT322ELU	SPMT090308N-LU			.0313				●	○	○	○	○	○	○				



Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

90° SQUARE TYPE

POSITIVE INSERT

Indexable Inserts for Turning

SP

90° Square Type

11° Relief

Without Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

Positive Inserts

C

D

R

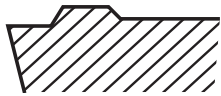

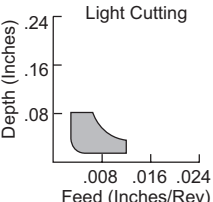
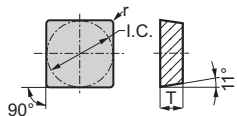
S



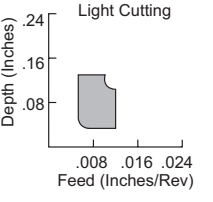
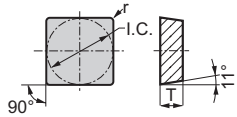
T

V

W

Swiss Tooling

SPMR EFK		Rake Angle: 0° 	Cutting Conditions:				Coated				Cermet				Uncoated						
			Continuous Cut	Medium Cut	Interrupted Cut																
		<p>Light Cutting</p>  <p>Depth (Inches) Feed (Inches/Rev)</p>																			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500Z				T2000Z				T1500A				T1200A			
SPMR321EFK	SPMR090304N-FK	.375		.0156																	
SPMR322EFK	SPMR090308N-FK			.0313																	
SPMR421EFK	SPMR120304N-FK		.125	.0156	-																
SPMR422EFK	SPMR120308N-FK	.500		.0313																	
SPMR423EFK	SPMR120312N-FK			.0469																	

SPMR ENF		Rake Angle: 0° 	Cutting Conditions:				Coated				Cermet				Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut													
		<p>Light Cutting</p>  <p>Depth (Inches) Feed (Inches/Rev)</p>																
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P				AC830P								
SPMR321ENF	SPMR090304N-SF	.375		.0156														
SPMR322ENF	SPMR090308N-SF			.0313														
SPMR421ENF	SPMR120304N-SF		.125	.0156	-													
SPMR422ENF	SPMR120308N-SF	.500		.0313														
SPMR423ENF	SPMR120312N-SF			.0469														



SP

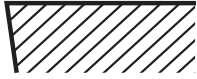

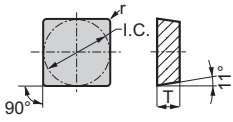
90° Square Type

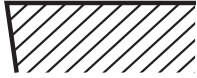

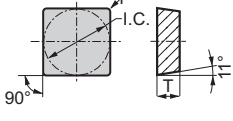
11° Relief

Without Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

SPG		No Breaker		Cutting Conditions:		Coated		Cermet		Uncoated								
-																		
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC510U	T1500Z	T2000Z	T1500A	T1200A	G10E						
SPG321	SPGN090304	.375	.125	.0156		●	●	●	●	●	●	●	●					
SPG322	SPGN090308			.0313			●	●	●	●	●	●	●	●				
SPG421	SPGN120304			.0156											●			
SPG422	SPGN120308			.0313		●	●	●	●	●	●	●	●	▲				
SPG423	SPGN120312	.500	.125	.0469		●		●	●	●	●	●	●					
SPG424	SPGN120316			.0625														
SPG432	SPGN120408			.0313						●								
SPG433	SPGN120412			.0469		●												
SPG632	SPGN190408		.1875	.0313		●												
SPG633	SPGN190412	.750		.0469														
SPG634	SPGN190416			.0625														

SPMN		No Breaker		Cutting Conditions:		Coated		Cermet		Uncoated									
-																			
																			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC700G	AC410K	AC415K	AC420K	T1500A	T1200A	G10E						
SPMN321	SPMN090304	.375	.125	.0156		●	●	▲	●	●	●	●	●						
SPMN322	SPMN090308			.0313			●	●	▲	●	●	●	●	●					
SPMN421	SPMN120304			.0156					▲	●	●	●	●	●					
SPMN422	SPMN120308	.500	.125	.0313		●		●	●	●	●	●	●						
SPMN423	SPMN120312			.0469					▲	●	●	●	●	●					
SPMN532	SPMN150408			.0313						●	●	●	●	●					
SPMN533	SPMN150412	.625	.1875	.0313		●							●						
SPMN534	SPMN150416	.750		.0469										●					
SPMN634	SPMN190416			.0625										●					

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling



TRIANGULAR TYPE

POSITIVE INSERT

Indexable Inserts for Turning

TB

Triangular Type

5° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TBGT FW

Rake Angle: 20°



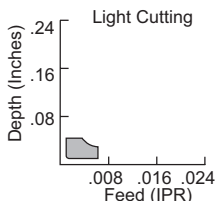
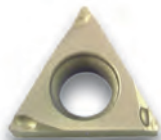
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet				Uncoated			
	●	●	●	●				
	●	●	●	●				
		●	●					



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500Z	T2000Z	T1500A	T1200A
TBGT520.5RFX	TBGT060102R-FW			.0078					
TBGT520.5LFX	TBGT060102L-FW			.0078		●	●	●	●
TBGT521RFX	TBGT060104R-FW	.156	.0625	.0156	.090	●	●	●	●
TBGT521LFX	TBGT060104L-FW			.0156		●	●	●	●

TBGT FX

Rake Angle: 15°



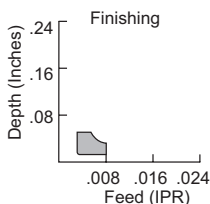
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet	Uncoated
● ● ●		
● ● ●		
● ● ●		



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC530U	AC510U
TBGT520.5RFX	TBGT060102R-FX			.0078				
TBGT520.5LFX	TBGT060102L-FX			.0078		●	●	●
TBGT521RFX	TBGT060104R-FX	.156	.0625	.0156	.090	●	●	●
TBGT521LFX	TBGT060104L-FX			.0156		●	●	●

TBGT FY

Rake Angle: 15°



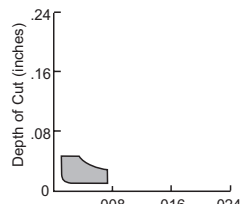
Cutting Conditions:

Continuous Cut

Medium Cut

Interrupted Cut

Coated	Cermet	Uncoated
● ● ●	● ●	
● ● ●	● ●	
● ● ●	● ●	



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	T1500A	T1200A
TBGT520RFY	TBGT060101R-FY			.0039				
TBGT520LFY	TBGT060101L-FY			.0039		●		
TBGT520.5RFY	TBGT060102R-FY	.156	.0625	.0078	.090	●	●	●
TBGT521RFY	TBGT060104R-FY			.0156		●	●	●
TBGT521LFY	TBGT060104L-FY			.0156		●	●	●



TB

Triangular Type

5° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TBGT W		Rake Angle: 10° 	Cutting Conditions:				Coated	Cermet		Uncoated				
			Continuous Cut	Medium Cut	Interrupted Cut									
								T1500Z T1500A						
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
TBGT520.5R	TBGT060102R-W			.0078										
TBGT520.5L	TBGT060102L-W			.0078										
TBGT521R	TBGT060104R-W	.156	.0625	.0156	.090									
TBGT521L	TBGT060104L-W			.0156										

TCGT FX		Rake Angle: 15° 	Cutting Conditions:				Coated	Cermet		Uncoated				
			Continuous Cut	Medium Cut	Interrupted Cut									
								AC530U						
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
TCGT1.81.50RFX	TCGT090201R-FX			.0039										
TCGT1.81.50.5RFX	TCGT090202R-FX	.219		.0078	.098									
TCGT1.81.50.5LFX	TCGT090202L-FX		.094	.0078										
TCGT21.50RFX	TCGT110201R-FX			.0039										
TCGT21.50LFX	TCGT110201L-FX	.250		.0039	.110									
TCGT21.50.5RFX	TCGT110202R-FX			.0078										

TCGT FY		Rake Angle: 15° 	Cutting Conditions:				Coated		Cermet	Uncoated
			Continuous Cut	Medium Cut	Interrupted Cut					
								AC530U		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1					
TCGT1.81.50LFY	TCGT090201L-FY	.219	.094	.0039	.098					
TCGT21.50.5LFY	TCGT110202L-FY	.250		.0078	.110					



Positive Inserts



Swiss Tooling

TRIANGULAR TYPE

POSITIVE INSERT

Indexable Inserts for Turning

TC

Triangular Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TCGT EFM		Rake Angle: 6°		Cutting Conditions:		Coated		Cermet		Uncoated		
				Continuous Cut		●		●	●			
				Medium Cut		●		●	●			
				Interrupted Cut		●		●	●			
						AC530U		T1500Z		T2000Z		
						T1500A		T1200A				
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1							
TCGT630EFM	TCGT080201N-SC			.0039		●						
TCGT630MEFM	TCGT080201MN-SC	.1875		.0039	.090							
TCGT630.5EFM	TCGT080202N-SC			.0078								
TCGT630.5MEFM	TCGT080202MN-SC			.0078								
TCGT1.81.50EFM	TCGT090201N-SC	.219	.094	.0039	.098							
TCGT1.81.50.5EFM	TCGT090202N-SC					.0078						
TCGT21.50EFM	TCGT110201N-SC			.0039		★						
TCGT21.50MEFM	TCGT110201MN-SC	.250		.0039	.110							
TCGT21.50.5EFM	TCGT110202N-SC			.0078								
TCGT21.50.5MEFM	TCGT110202MN-SC			.0078								

M = Negative nose radius tolerance (-0.0001" to -0.0004")

TCMT EFB		Rake Angle: 20°		Cutting Conditions:		Coated		Cermet		Uncoated		
				Continuous Cut				●	●			
				Medium Cut				●	●			
				Interrupted Cut				●	●			
						T1500Z		T1500A				
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1							
TCMT21.51EFB	TCMT110204N-FB	.250	.094	.0156	.110							
TCMT21.52EFB	TCMT110208N-FB					.0313						



TC

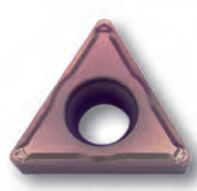
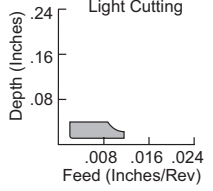

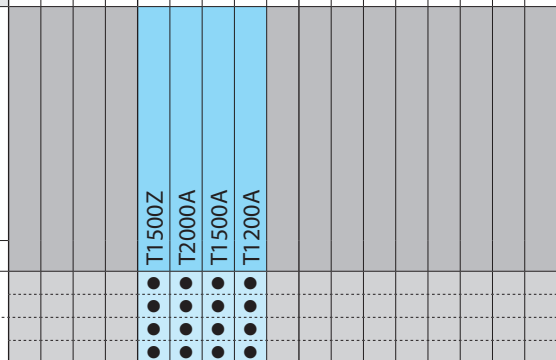
Triangular Type


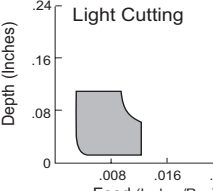

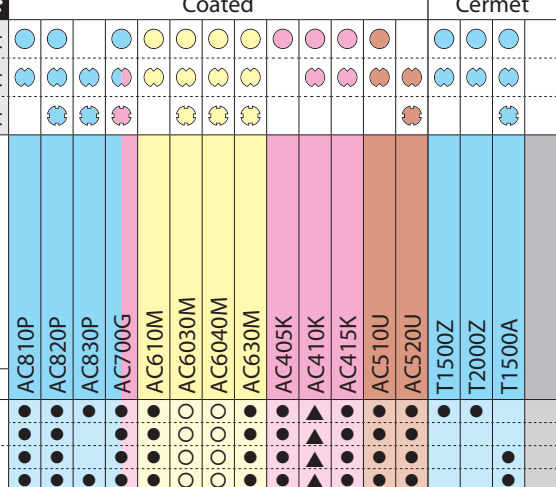
7° Relief



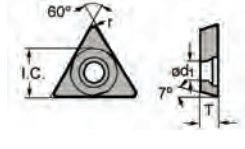
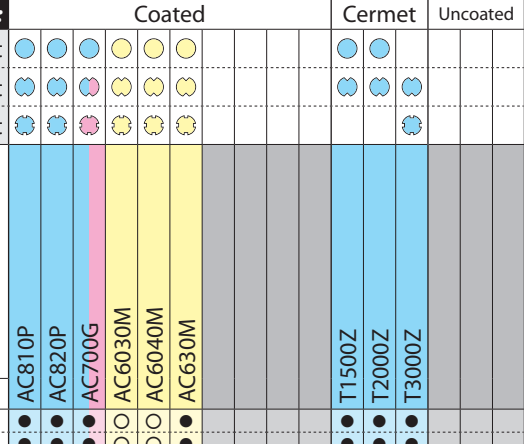
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TCMT EFP		Rake Angle: 10°	Cutting Conditions:						Coated			Cermets				Uncoated								
			Continuous Cut	Medium Cut	Interrupted Cut																			
																								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																			
TCMT21.51EFP	TCMT110204N-FP	.250	.094	.0156	.110																			
TCMT21.52EFP	TCMT110208N-FP			.0313																				
TCMT32.51EFP	TCMT16T304N-FP	.375	.156	.0156	.1693																			
TCMT32.52EFP	TCMT16T308N-FP			.0313																				

TCMT ESU		Rake Angle: 8°	Cutting Conditions:						Coated										Cermets					
			Continuous Cut	Medium Cut	Interrupted Cut																			
																								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																			
TCMT21.51ESU	TCMT110204N-SU	.250	.094	.0156	.110																			
TCMT21.52ESU	TCMT110208N-SU			.0313																				
TCMT32.51ESU	TCMT16T304N-SU	.375	.156	.0156	.1693																			
TCMT32.52ESU	TCMT16T308N-SU			.0313																				

TCMT ELU		Rake Angle: 12°	Cutting Conditions:						Coated						Cermets			Uncoated						
			Continuous Cut	Medium Cut	Interrupted Cut																			
																								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1																			
TCMT21.51ELU	TCMT110204N-LU	.250	.094	.0156	.110																			
TCMT32.52ELU	TCMT16T308N-LU	.375	.156	.0313	.1693																			



Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

TRIANGULAR TYPE

POSITIVE INSERT

Indexable Inserts for Turning

TC



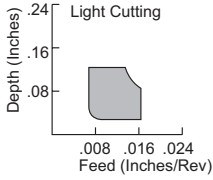
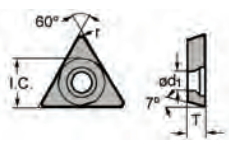
Triangular Type

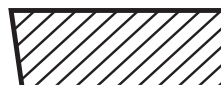

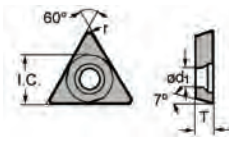
7° Relief

With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TCMT ENK		Rake Angle: 8°	Cutting Conditions:				Coated				Cermet				Uncoated			
			Continuous Cut				Medium Cut				Interrupted Cut							
		 <p>Depth (Inches)</p> <p>Feed (Inches/Rev)</p>					AC810P	AC820P	AC830P	AC700G								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
TCMT21.51ENK	TCMT110204N-SK	.250	.094	.0156	.110													
TCMT21.52ENK	TCMT110208N-SK																	
TCMT32.51ENK	TCMT16T304N-SK	.375	.156	.0156	.1693													
TCMT32.52ENK	TCMT16T308N-SK																	
TCMT32.53ENK	TCMT16T312N-SK																	

TCMA -		No Breaker	Cutting Conditions:				Coated				Cermet				Uncoated				
			Continuous Cut				Medium Cut				Interrupted Cut								
							AC700G	AC405K	AC410K	AC415K	AC420K								
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1														
TCMA21.51	TCMW 110204	.250	.094	.0156	.110														
TCMA21.52	TCMW 110208																		
TCMA32.51	TCMW 16T304	.375	.156	.0156	.1693														
TCMA32.52	TCMW 16T308																		
TCMA32.53	TCMW 16T312																		



TP


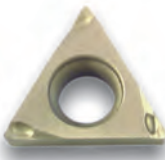

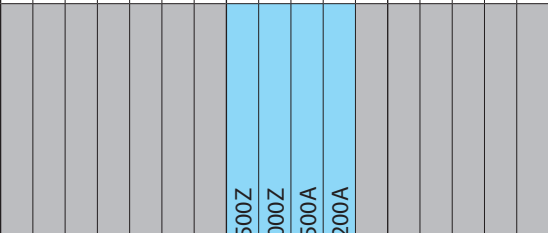
Triangular Type


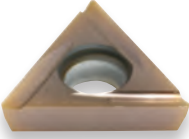

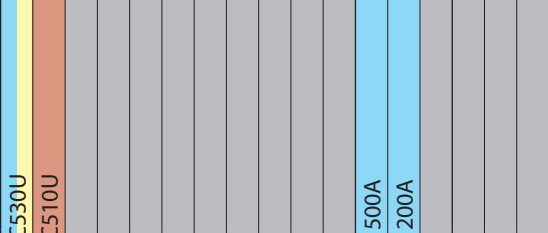
11° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPGT FW		Rake Angle: 20° 	Cutting Conditions:						Coated				Cermet				Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut															
		Depth (Inches) .24 .16 .08 Light Cutting .008 .016 .024 Feed (IPR)																		
					Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500Z	T2000Z	T1500A	T1200A						
TPGT630.5RFX	TPGT080202R-FW	.1875		.0078	.090	●	●	●	●											
TPGT630.5LFX	TPGT080202L-FW					●	●	●	●											
TPGT631RFX	TPGT080204R-FW	.094		.0156	.090	●	●	●	●											
TPGT631LFX	TPGT080204L-FW					●	●	●	●											
TPGT21.50.5RFX	TPGT110202R-FW	.250		.0078	.110	●	●	●	●											
TPGT21.50.5LFX	TPGT110202L-FW					●	●	●	●											
TPGT21.51RFX	TPGT110204R-FW	.250		.0156	.110	●	●	●	●											
TPGT21.51LFX	TPGT110204L-FW					●	●	●	●											

TPGT FX		Rake Angle: 15° 	Cutting Conditions:						Coated				Cermet				Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut															
		Depth (Inches) .24 .16 .08 Finishing .008 .016 .024 Feed (IPR)																		
					Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	AC510U								
TPGT630.5RFX	TPGT080202R-FX	.1875		.0078	.090	★	●	●	●											
TPGT630.5LFX	TPGT080202L-FX					★	●	●	●											
TPGT631RFX	TPGT080204R-FX	.094		.0156	.090	★	●	●	●											
TPGT631LFX	TPGT080204L-FX					★	●	●	●											
TPGT1.81.51LFX	TPGT090204L-FX	.219		.0156	.102	●	●	●	●											
TPGT21.50.5RFX	TPGT110202R-FX					●	●	●	●											
TPGT21.50.5LFX	TPGT110202L-FX	.250		.0078	.110	●	●	●	●											
TPGT21.51RFX	TPGT110204R-FX					●	●	●	●											
TPGT21.51LFX	TPGT110204L-FX	.250		.0156	.110	●	●	●	●											
TPGT21.52LFX	TPGT110208L-FX					●	●	●	●											
TPGT220.5RFX	TPGT110302R-FX	.125		.0078	.130	★	●	●	●											
TPGT220.5LFX	TPGT110302L-FX					★	●	●	●											
TPGT221RFX	TPGT110304R-FX	.125		.0156	.130	★	●	●	●											
TPGT221LFX	TPGT110304L-FX					★	●	●	●											



Positive Inserts



Swiss Tooling

TRIANGULAR TYPE



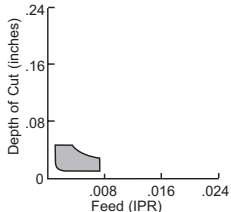
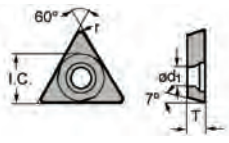
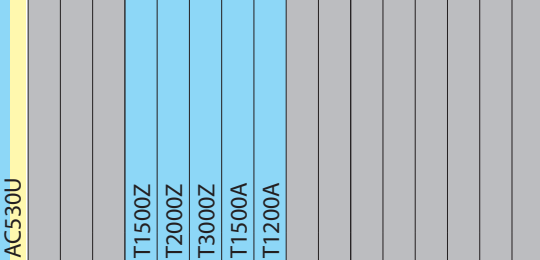
POSITIVE INSERT


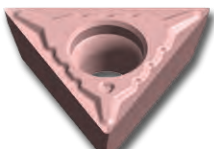
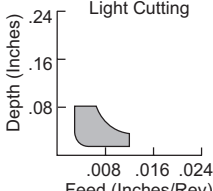
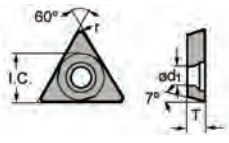
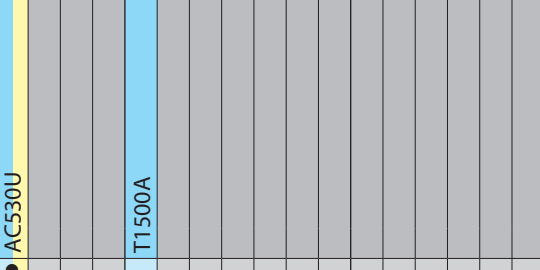
Indexable Inserts for Turning

TP Triangular Type
11° Relief
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPGT FY		Rake Angle: 15° 	Cutting Conditions:					Coated		Cermet					Uncoated													
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●										
																												
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	T1500Z	T2000Z	T3000Z	T1500A	T1200A																	
TPGT630RFY	TPGT080201R-FY	.1875		.0039	.090	★																						
TPGT630LFY	TPGT080201L-FY					★																						
TPGT630.5RFY	TPGT080202R-FY					★																						
TPGT630.5LFY	TPGT080202L-FY					★																						
TPGT631RFY	TPGT080204R-FY	.094		.0156	.110																							
TPGT631LFY	TPGT080204L-FY					★																						
TPGT21.50.5RFY	TPGT110202R-FY					★																						
TPGT21.50.5LFY	TPGT110202L-FY					★																						
TPGT21.51RFY	TPGT110204R-FY	.250		.0156	.130																							
TPGT21.51LFY	TPGT110204L-FY					★																						
TPGT21.52LFY	TPGT110208L-FY					★																						
TPGT220RFY	TPGT110301R-FY	.125		.0039	.130																							
TPGT220LFY	TPGT110301L-FY					★																						
TPGT220.5RFY	TPGT110302R-FY					★																						
TPGT220.5LFY	TPGT110302L-FY																											
TPGT221RFY	TPGT110304R-FY																											
TPGT221LFY	TPGT110304L-FY					★																						
TPGT222RFY	TPGT110308R-FY					★																						
TPGT222LFY	TPGT110308L-FY					●																						

TPGT EFC		Rake Angle: 15° 	Cutting Conditions:					Coated		Cermet					Uncoated														
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●												
																													
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	T1500A																						
TPGT220.5EFC	TPGT110302N-FC	.250	.125	.0078	.130	●																							
TPGT220.5MEFC	TPGT110302MN-FC					●																							
TPGT221EFC	TPGT110304N-FC					●																							
TPGT221MEFC	TPGT110304MN-FC					●																							

M = Negative nose radius tolerance (-0.0001" to -0.0004")



TP

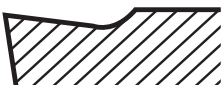
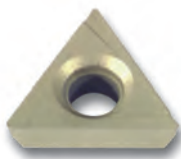
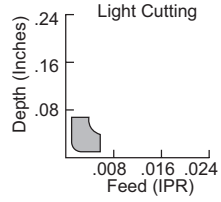
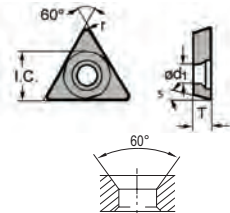
Triangular Type


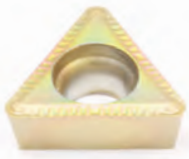
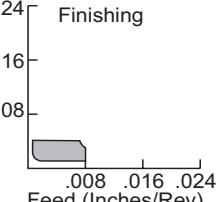
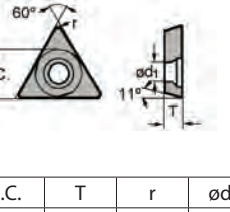
11° Relief



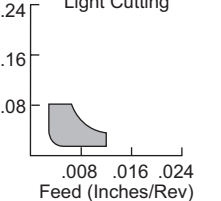
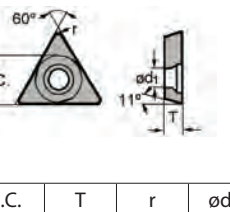
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPGT W		Rake Angle: 10° 	Cutting Conditions:						Coated		Cermet				Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●			
		 <p>Light Cutting</p> <p>Depth (Inches): .24, .16, .08</p> <p>Feed (IPR): .008, .016, .024</p>							AC530U	AC510U	T1500Z	T2000Z	T3000Z	T1500A	T1200A	G10E				
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1															
TPGT630.5R	TPGT080202R-W			.0078																
TPGT630.5L	TPGT080202L-W	.1875	.094	.0078	.090	★	●			●	●	●	●	●	▲					
TPGT631R	TPGT080204R-W			.0156		★	●			●	●	●	●	●						
TPGT631L	TPGT080204L-W			.0156		★	●			●	●	●	●	●						

TPMT EFB		Rake Angle: 20° 	Cutting Conditions:						Coated		Cermet				Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●			
		 <p>Finishing</p> <p>Depth (Inches): .24, .16, .08</p> <p>Feed (Inches/Rev): .008, .016, .024</p>									T1500Z									
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1															
TPMT222EFB	TPMT110308N-FB	.250	.125	.0156	.110					●										

TPMT EFK		Rake Angle: 0° 	Cutting Conditions:						Coated		Cermet				Uncoated					
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●			
		 <p>Light Cutting</p> <p>Depth (Inches): .24, .16, .08</p> <p>Feed (Inches/Rev): .008, .016, .024</p>									T1500Z	T2000Z	T1500A	T1200A						
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1															
TPMT221EFK	TPMT110304N-FK	.250	.125	.0156	.110					●	●	●	●							
TPMT222EFK	TPMT110308N-FK			.0313						●	●	●	●							
TPMT331EFK	TPMT160404N-FK	.375	.1875	.0156	.1693					●	●	●	●							
TPMT332EFK	TPMT160408N-FK			.0313						●	●	●	●							



Positive Inserts



Swiss Tooling

TRIANGULAR TYPE

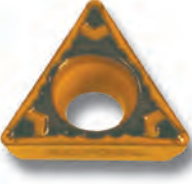


POSITIVE INSERT



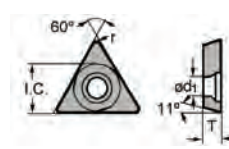
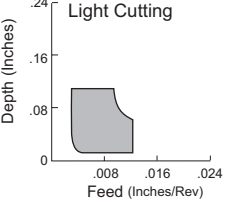
Indexable Inserts for Turning

TP Triangular Type
11° Relief
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPMT ELU		Rake Angle: 12°	Cutting Conditions:						Coated			Cermet			Uncoated			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC700G	AC530U	AC6030M	AC6040M	AC630M	T1500Z	T2000Z	T3000Z			
TPMT1.81.50.5ELU	TPMT090202N-LU	.219	.094	.0078	.110	●	●	●	●	●	●	●	●	●	●			
TPMT1.81.51ELU	TPMT090204N-LU			.0156		●	●	●	●	●	●	●	●	●	●	●	●	
TPMT221ELU	TPMT110304N-LU	.250	.125	.0156		●	●	●	★	○	○	●	●	●	●			
TPMT222ELU	TPMT110308N-LU			.0313		●	●	●	●	●	●	★	○	○	●	●	●	

TPMT ESU		Rake Angle: 8°	Cutting Conditions:						Coated						Cermet				UC			
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
																						
																						
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC810P	AC820P	AC830P	AC700G	AC610M	AC6030M	AC6040M	AC630M	AC510U	AC520U	T1500Z	T2000Z	T3000Z	T1500A	T1200A		
TPMT1.81.50.5ESU	TPMT090202N-SU	.219	.094	.0078	.102	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	▲
TPMT1.81.51ESU	TPMT090204N-SU			.0156		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT21.50.5ESU	TPMT110202N-SU	.250	.125	.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT21.51ESU	TPMT110204N-SU			.0156		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT21.52ESU	TPMT110208N-SU	.250	.125	.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT220.5ESU	TPMT110302N-SU			.0078		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT221ESU	TPMT110304N-SU	.250	.125	.0156		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT222ESU	TPMT110308N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT32.51ESU	TPMT16T304N-SU	.375	.156	.0156	.1693	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT32.52ESU	TPMT16T308N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT331ESU	TPMT160404N-SU	.375	.1875	.0156		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPMT332ESU	TPMT160408N-SU			.0313		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●



TP

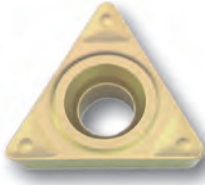
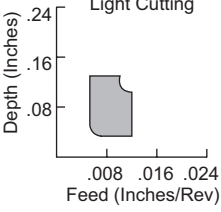
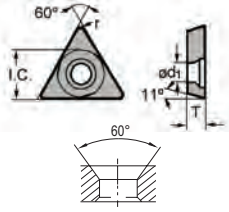
Triangular Type


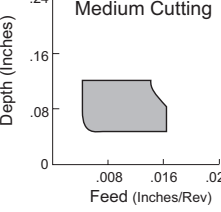
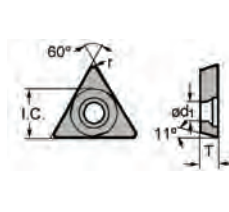
11° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPMT ENF		Rake Angle: 0°	Cutting Conditions:						Coated			Cermet			Uncoated				
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●											
									AC820P	AC830P	AC700G	AC510U							
			Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	●	●	●	●							
TPMT221ENF		TPMT110304N-SF	.250	.125	.0156	.130	●	●	●	●									
TPMT222ENF		TPMT110308N-SF			.0313		●	●	●	●									
TPMT331ENF		TPMT160404N-SF	.375	.1875	.0156	.1693	●	●	●	●									
TPMT332ENF		TPMT160408N-SF			.0313		●	●	●	●									

TPMT EMU		Rake Angle: 0°	Cutting Conditions:						Coated			Cermet			Uncoated				
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●											
									AC810P	AC820P	AC700G	AC410K	AC420K						
			Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	●	●	●	▲	●						
TPMT221EMU		TPMT110304N-MU	.250	.125	.0156	.130	●	●	●	▲	●								
TPMT222EMU		TPMT110308N-MU			.0313		●	●	●	▲	●								
TPMT331EMU		TPMT160404N-MU	.375	.1875	.0156	.1693	●	●	●	▲	●								
TPMT332EMU		TPMT160408N-MU			.0313		●	●	●	▲	●								

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling



TRIANGULAR TYPE

POSITIVE INSERT

Indexable Inserts for Turning

TP Triangular Type
11° Relief
With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

TPGG		Rake Angle: 0°	Cutting Conditions:						Coated		Cermet					Uncoated			
SD			Continuous Cut		Medium Cut		Interrupted Cut												
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	AC510U				T1500Z	T2000Z	T3000Z	T1500A	T1200A		G10E		
TPGG220.5R	TPGT110302R-SD			.0078		★						★	●	●	●	●			
TPGG220.5L	TPGT110302L-SD			.0078															
TPGG221R	TPGT110304R-SD			.0156		★	●					●	●	★	●	●			
TPGG221RW	TPGT110304RW-SD			.0156															
TPGG221L	TPGT110304L-SD			.0156		★	●						★	●	●				
TPGG221LW	TPGT110304LW-SD	.250		.0156	.130														
TPGG222R	TPGT110308R-SD			.0313		★													
TPGG222RW	TPGT110308RW-SD		.125	.0313															
TPGG222L	TPGT110308L-SD			.0313								●	●	★	●	●			
TPGG222LW	TPGT110308LW-SD			.0313															
TPGG321R	TPGT160304R-SD			.0156															
TPGG321L	TPGT160304L-SD			.0156															
TPGG322R	TPGT160308R-SD			.0156															
TPGG322L	TPGT160308L-SD			.0156															
TPGG330R	TPGT160401R-SD			.0039															
TPGG330L	TPGT160401L-SD			.0039															
TPGG330.5R	TPGT160402R-SD	.375		.0078	.1693														
TPGG330.5L	TPGT160402L-SD			.0078															
TPGG331R	TPGT160404R-SD		.1875	.0156			●												
TPGG331L	TPGT160404L-SD			.0156			●												
TPGG332R	TPGT160408R-SD			.0313															
TPGG332L	TPGT160408L-SD			.0313															★

W = Wiper insert

TPGA		No Breaker	Cutting Conditions:						Coated		Cermet		Uncoated						
			Continuous Cut		Medium Cut		Interrupted Cut												
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500A	T1200A												
TPGA220.5	TPGW110302			.0078															
TPGA221	TPGW110304			.0156		●	●												★
TPGA222	TPGW110308	.250	.125	.0313	.130	●	●												●
TPGA331	TPGW160404			.0313															▲



TP



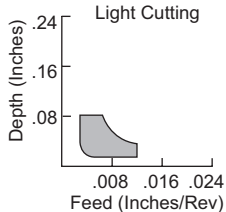
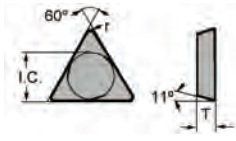
Triangular Type



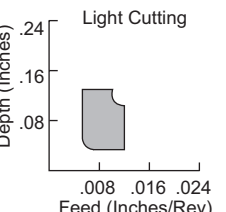
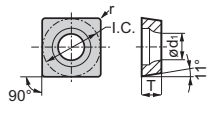
11° Relief

Without Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

<h2>TPMR</h2> <h2>EFK</h2>		Rake Angle: 0° 	Cutting Conditions: Continuous Cut Medium Cut Interrupted Cut				Coated				Cermet				Uncoated			
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
TPMR1.81.50.5EFK	TPMR090202N-FK			.0078														
TPMR1.81.51EFK	TPMR090204N-FK	.219	.094	.0156														
TPMR1.81.52EFK	TPMR090208N-FK			.0313														
TPMR220.5EFK	TPMR110302N-FK			.0078														
TPMR221EFK	TPMR110304N-FK	.250		.0156														
TPMR222EFK	TPMR110308N-FK		.125	.0313														
TPMR321EFK	TPMR160304N-FK			.0156														
TPMR322EFK	TPMR160308N-FK	.375		.0313														
TPMR323ENK	TPMR160312N-FK			.0469														

<h2>TPMR</h2> <h2>ENF</h2>		Rake Angle: 0° 	Cutting Conditions: Continuous Cut Medium Cut Interrupted Cut				Coated				Cermet				Uncoated			
																		
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1													
TPMR221ENF	TPMR110304N-SF			.0156														
TPMR222ENF	TPMR110308N-SF	.250		.0313														
TPMR321ENF	TPMR160304N-SF		.125	.0156														
TPMR322ENF	TPMR160308N-SF	.375		.0313														
TPMR323ENF	TPMR160312N-SF			.0469														
TPMR432ENF	TPMR220408N-SF	.500	.1875	.0313														
TPMR433ENF	TPMR220412N-SF			.0469														



Positive Inserts



Swiss Tooling

TRIANGULAR TYPE

POSITIVE INSERT

Indexable Inserts for Turning

TP

Triangular Type

11° Relief

Without Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

TPG		No Breaker	Cutting Conditions:						Coated		Cermet				Uncoated					
			Continuous Cut						●	●	●	●	●	●	●	●	●	●	●	
			Medium Cut						●	●	●	●	●	●	●	●	●	●	●	
			Interrupted Cut						●											
									●	●	●	●	●	●	●	●	●	●	●	●
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC510U	T1500Z	T2000Z	T1500A	T1200A	A30	G10E	H1						
TPG220.5	TPGN110302	.250		.0078		●	●													
TPG221	TPGN110304					●	●													
TPG222	TPGN110308					●	●													
TPG320.5	TPGN160302	.375	.125	.0078		●	●	●	●	●	●									
TPG321	TPGN160304					●	●	●	●	●	●	●	●	●						
TPG322	TPGN160308					●	●	●	●	●	●	●	●	●	●					
TPG323	TPGN160312	.500	.1875	.0469		●	●													
TPG324	TPGN160316					●	●													
TPG332	TPGN160408					●	●													
TPG431	TPGN220404	.500	.1875	.0156		●	●													
TPG432	TPGN220408					●	●													
TPG433	TPGN220412					●	●													
TPG434	TPGN220416					●	●													
TPG436	TPGN220424			.0938		●	●													

TPMN		No Breaker	Cutting Conditions:						Coated		Cermet				Uncoated				
			Continuous Cut						●	●	●	●	●	●	●	●	●	●	
			Medium Cut						●	●	●	●	●	●	●	●	●	●	
			Interrupted Cut						●	●	●	●	●	●	●	●	●	●	
									●	●	●	●	●	●	●	●	●	●	●
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC820P	AC700G	AC410K	AC420K	T1500A	T1200A	A30							
TPMN221	TPMN110304	.250		.0156		●	●	●	●										
TPMN222	TPMN110308					●	●	●	●										
TPMN321	TPMN160304					●	●	●	●										
TPMN322	TPMN160308	.375	.125	.0313		●	●	●	●	●	●								
TPMN323	TPMN160312					●	●	●	●	●	●	●	●	●					
TPMN431	TPMN220404					●	●	●	●										
TPMN432	TPMN220408	.500	.1875	.0156		●	●												
TPMN433	TPMN220412					●	●												
TPMN434	TPMN220416					●	●												
						●	●												



TRIANGULAR TYPE POSITIVE INSERT

TE


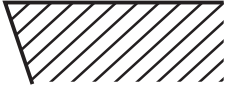



Triangular Type





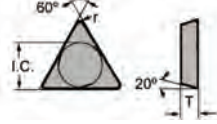
20° Relief

Without Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

TEGE		No Breaker	Cutting Conditions:				Coated	Cermet	Uncoated											
			Continuous Cut																	
			Medium Cut																	
			Interrupted Cut																	
																				
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1													
TEGE21.50.5		TEGE110202		.250	.094	.0078	-													

TEGN		No Breaker	Cutting Conditions:				Coated	Cermet		Uncoated										
			Continuous Cut																	
			Medium Cut																	
			Interrupted Cut																	
																				
Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1													
TEGN220.5		TEGN110302		.250	.125	.0078	-													
TEGN222		TEGN110308																		
TEGN320.5		TEGN160302		.375		.0078	-													
TEGN322		TEGN160308																		

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling



35° DIAMOND TYPE

POSITIVE INSERT

Indexable Inserts for Turning

VB

35° Diamond Type

5° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

Positive Inserts

C

D

R


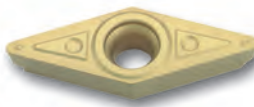
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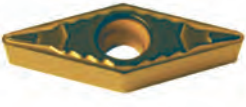
T


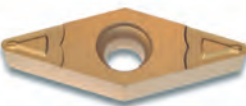
V

W

Swiss Tooling

VBMT ENK		Rake Angle: 8° 	Cutting Conditions:														
			Coated	Cermet			Uncoated										
			Continuous Cut	●													
			Medium Cut	●													
			Interrupted Cut	●													
 Depth (Inches) vs Feed (Inches/Rev) graph Light Cutting Feed (Inches/Rev): .008, .016, .024 I.C., T, r, ød1 diagram		AC820P															
			Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
VBMT332ENK			VBMT160408N-SK	.375	.1875	.0313	.1732										

VBMT ELU		Rake Angle: 12° 	Cutting Conditions:														
			Coated			Cermet		Uncoated									
			Continuous Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Medium Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
 Depth (Inches) vs Feed (Inches/Rev) graph Light Cutting Feed (Inches/Rev): .008, .016, .024 I.C., T, r, ød1 diagram		AC810P	AC820P	AC700G	AC530U	AC6030M	AC6040M	AC630M				T1500Z	T2000Z	T3000Z			
			Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
VBMT221ELU			VBMT110304N-LU	.250	.125	.0156	.134										
VBMT331ELU			VBMT110404N-LU	.375	.1875	.0156	.1732										
VBMT332ELU			VBMT110408N-LU	.375	.1875	.0313	.1732										

VBMT ESU		Rake Angle: 8° 	Cutting Conditions:																
			Coated			Cermet													
			Continuous Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
			Medium Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
			Interrupted Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
 Depth (Inches) vs Feed (Inches/Rev) graph Light Cutting Feed (Inches/Rev): .008, .016, .024 I.C., T, r, ød1 diagram		AC810P	AC820P	AC830P	AC700G	AC610M	AC6030M	AC6040M	AC630M	AC510U	AC520U				T1500Z	T2000Z	T3000Z	T1500A	T1200A
			Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1											
VBMT221ESU			VBMT110304N-SU	.250	.125	.0156	.134												
VBMT222ESU			VBMT110308N-SU	.250	.125	.0313	.134												
VBMT331ESU			VBMT160404N-SU	.375	.1875	.0156	.1732												
VBMT332ESU			VBMT160408N-SU	.375	.1875	.0313	.1732												



VB


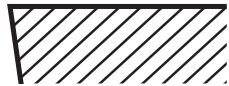
35° Diamond Type



5° Relief



With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

VBMA		No Breaker	Cutting Conditions:				Coated	Cermet	Uncoated
			Continuous Cut	●	●				
			Medium Cut	●	●	●			
			Interrupted Cut	●	●				
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1	AC700G	AC410K	AC420K
VBMA331		VBMA160404			.0156	.1732	★	▲	●
VBMA332		VBMA160408	.375	.1875	.0313		★	▲	●

VCGT NAG		Rake Angle: 8°	Cutting Conditions:				Coated	Cermet	Uncoated
			Continuous Cut						●
			Medium Cut						●
			Interrupted Cut						
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1			H1
VCMT220.5NAG		VCMT110302N-AG			.0078	.134			●
VCMT221NAG		VCMT110304N-AG	.250	.125	.0156				●
VCMT332NAG		VCMT160408N-AG	.375	.1875	.0313	.1732			★

VCGT EFC		Rake Angle: 15°	Cutting Conditions:				Coated	Cermet	Uncoated
			Continuous Cut	●				●	
			Medium Cut	●				●	
			Interrupted Cut	●					●
Sumitomo Catalog #		ISO Catalog #	I.C.	T	r	ød1	AC530U	T1500A	
VCGT220EFC		VCGT110301N-FC			.0039	.134	●	●	
VCGT220MEFC		VCGT110301MN-FC			.0039		●	●	
VCGT220.5EFC		VCGT110302N-FC	.250	.125	.0078		●	●	
VCGT220.5MEFC		VCGT110302MN-FC			.0078		●	●	
VCGT221EFC		VCGT110304N-FC			.0156		●	●	
VCGT221MEFC		VCGT110304MN-FC			.0156		●	●	

M = Negative nose radius tolerance (-0.0001" to -0.0004")

Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling



35° DIAMOND TYPE POSITIVE INSERT

Indexable Inserts for Turning

VC

35° Diamond Type

7° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

VC GT ESI

Rake Angle: 15°



Cutting Conditions:

Continuous Cut

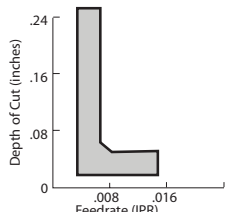
Medium Cut

Interrupted Cut

Coated

Cermet

Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U	AC610M	AC6030M	AC630M	AC510U	AC520U
VC GT220MESI	VC GT1103M01MN-SI	.250	.125	.0039	.134	●	●	○	●	●	●
VC GT220.5MESI	VC GT1103M02MN-SI			.0078		●	●	○	●	●	●
VC GT221MESI	VC GT1103M04MN-SI			.0156		●	●	○	●	●	●
VC GT222MESI	VC GT1103M08MN-SI			.0313		●	●	○	●	●	●
VC GT330MESI	VC GT1604M02MN-SI			.0039		●	●	○	●	●	●
VC GT331MESI	VC GT1604M04MN-SI			.0156		●	●	○	●	●	●

M = Negative nose radius tolerance (-0.0001" to -0.0004")

VC MT EFB

Rake Angle: 20°



Cutting Conditions:

Continuous Cut

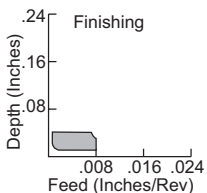
Medium Cut

Interrupted Cut

Coated

Cermet

Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T1500Z	T1500A
VC MT331EFB	VC MT160404N-FB	.375	.1875	.0156	.1732	●	●
VC MT332EFB	VC MT160408N-FB			.0313		●	●

VC MT EFP

Rake Angle: 10°



Cutting Conditions:

Continuous Cut

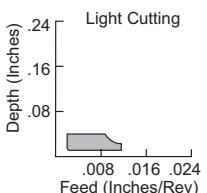
Medium Cut

Interrupted Cut

Coated

Cermet

Uncoated



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	T2000Z	T1200A
VC MT331EFP	VC MT160404N-FP	.375	.1875	.0156	.1732	●	●
VC MT332EFP	VC MT160408N-FP			.0313		●	●



VC


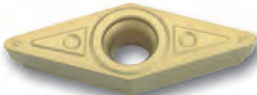

35° Diamond Type


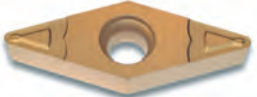

7° Relief


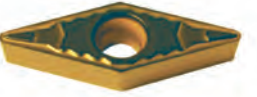

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

VCMT ENK		Rake Angle: 8° 	Cutting Conditions:						Coated		Cermet		Uncoated		
			Continuous Cut	Medium Cut	Interrupted Cut	●	●								
 Light Cutting Depth (Inches) .24 .16 .08 .008 .016 .024 Feed (IPR)				AC820P		AC830P									
				Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1				
VCMT331ENK		VCMT160404N-SK		.375	.1875	.0156	.1732								
VCMT332ENK		VCMT160408N-SK				.0313									

VCMT ESU		Rake Angle: 8° 	Cutting Conditions:						Coated				Cermet	Uncoated							
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●								
 Light Cutting Depth (Inches) .24 .16 .08 0 .008 .016 .024 Feed (Inches/Rev)				AC810P		AC820P		AC830P		AC610M		AC6030M		AC6040M		AC630M		AC510U		AC520U	
				Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1										
VCMT331ESU		VCMT160404N-SU		.375	.1875	.0156	.1732														
VCMT332ESU		VCMT160408N-SU				.0313															

VCMT ELU		Rake Angle: 12° 	Cutting Conditions:						Coated				Cermet			Uncoated		
			Continuous Cut	Medium Cut	Interrupted Cut	●	●	●	●	●	●	●	●	●	●			
 Light Cutting Depth (Inches) .24 .16 .08 0 .008 .016 .024 Feed (Inches/Rev)				AC810P		AC820P		AC700G		AC6030M		AC6040M		AC630M				
				Sumitomo Catalog #		ISO Catalog #		I.C.	T	r	ød1							T1500Z
VCMT331ELU		VCMT160404N-LU		.375	.1875	.0156	.1732									T2000Z		
VCMT332ELU		VCMT160408N-LU				.0313										T3000Z		



Positive Inserts



Swiss Tooling

80° TRIGON TYPE

POSITIVE INSERT

Indexable Inserts for Turning

WB

80° Trigon Type

5° Relief

With Insert Hole

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

Positive Inserts

C

D

R


S


T

V

W

Swiss Tooling

WBGT FW		Rake Angle: 15°		Cutting Conditions:			Coated				Cermet				Uncoated			
							Continuous Cut				Medium Cut				Interrupted Cut			
							●				●				●			
							●				●				●			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1					T1500Z								
WBGT520.5RFW	WBGT060102R-FW	.156	.0625	.0078	.090					●								
WBGT520.5LFW	WBGT060102L-FW									●								
WBGT521RFW	WBGT060104R-FW									●								
WBGT521LFW	WBGT060104L-FW									●								
WBGT630.5RFW	WBGT080202R-FW	.1875	.094	.0078	.090					●								
WBGT630.5LFW	WBGT080202L-FW									●								
WBGT631RFW	WBGT080204R-FW									●								
WBGT631LFW	WBGT080204L-FW									●								

WBGT FX		Rake Angle: 15°		Cutting Conditions:			Coated				Cermet				Uncoated			
							Continuous Cut				Medium Cut				Interrupted Cut			
							●				●				●			
							●				●				●			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1	AC530U												
WBGT630.5RFX	WBGT080202R-FX	.1875	.094	.0078	.090	●												
WBGT630.5LFX	WBGT080202L-FX									●								
WBGT631RFX	WBGT080204R-FX									●								
WBGT631LFX	WBGT080204L-FX									●								



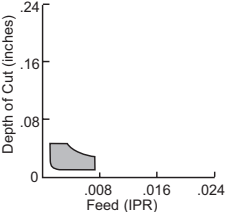
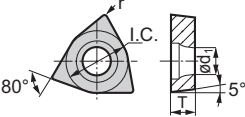




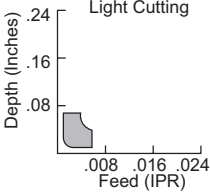
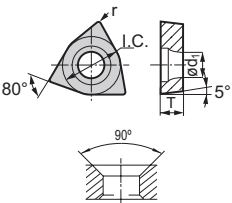
WB

80° Trigon Type
5° Relief
With Insert Hole

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-ferrous
- S Exotic Materials
- H Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

WBGT		Rake Angle: 15°	Cutting Conditions:						Coated		Cermet		Uncoated	
FY			Continuous Cut											
			Medium Cut											
			Interrupted Cut											
									T1500A		T1200A			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
WBGT520.5RFY	WBGT060102R-FY			.0078				★	●					
WBGT520.5LFY	WBGT060102L-FY			.0078				★	●					
WBGT521RFY	WBGT060104R-FY	.156	.0625	.0156	.090			★	●					
WBGT521LFY	WBGT060104L-FY			.0156				●	●					

WBGT		Rake Angle: 10°	Cutting Conditions:						Coated		Cermet		Uncoated	
W			Continuous Cut											
			Medium Cut											
			Interrupted Cut											
									T1500Z		T1500A			
Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	ød1									
WBGT520.5L	WBGT060102L-W			.0078										
WBGT521R	WBGT060104R-W	.156	.0625	.0156	.090			★	●					
WBGT521L	WBGT060104L-W			.0156				●	★					

Positive Inserts



Swiss Tooling



PCBN & PCD INSERTS

Pages 140-177



PCBN & PCD
Inserts

PCBN & PCD INSERTS

PAGES

PCBN Inserts	140-164
PCD Inserts	164-177

Cubic Boron Nitride (PCBN) Inserts

See pages 562 - 563 for running parameters.

PCBN

INSERTS - POSITIVE

CCGA



80° Diamond Type




7° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

PCBN & PCD Inserts

CCGA	Catalog No.	ISO Cat. No.	Coated											Uncoated						Dimensions							
			H					K	H					K	S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Dia. (ødi)						
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350						BN7000	BN700	BN5800	BN7500		
Coated Mini Tip 	NC-CCGA21.51	NC-CCGW060204	○	○	●	●	●																.250	.094	.0156	.015	.110
	2NC-CCGA21.50.5	2NC-CCGW060202	○	○			●	★															.250	.094	.0078	.015	.110
	2NC-CCGA21.50.5WG	2NC-CCGW060202WG	○	○		●	●																.250	.094	.0078	.015	.110
	2NC-CCGA21.51	2NC-CCGW060204	○	○				★															.250	.094	.0156	.015	.110
	2NC-CCGA21.51WG	2NC-CCGW060204WG	○	○		●	●																.250	.094	.0156	.015	.110
	2NC-CCGA21.52	2NC-CCGW060208	○	○				★															.250	.094	.0156	.015	.110
	2NC-CCGA21.52WG	2NC-CCGW060208WG	○	○		●	●																.250	.094	.0156	.015	.110
	2NC-CCGA32.50.5	2NC-CCGW09T302	○	○			●	★															.375	.156	.0078	.015	.1732
	2NC-CCGA32.50.5WG	2NC-CCGW09T302WG	○	○		●	●																.375	.156	.0078	.015	.1732
	2NC-CCGA32.51	2NC-CCGW09T304	○	○		●	●	★															.375	.156	.0156	.015	.1732
	2NC-CCGA32.51LS	2NC-CCGW09T304LS	○	○		●	●																.375	.156	.0156	.015	.1732
	2NC-CCGA32.51W	2NC-CCGW09T304W	○	○		●	●																.375	.156	.0156	.015	.1732
	2NC-CCGA32.51WG	2NC-CCGW09T304WG	○	○		●	●																.375	.156	.0156	.015	.1732
	2NC-CCGA32.52	2NC-CCGW09T308	○	○		●	●	★															.375	.156	.0313	.015	.1732
2NC-CCGA32.52LS	2NC-CCGA32.52LS	○	○		●	●																.375	.156	.0313	.015	.1732	
2NC-CCGA32.52WG	2NC-CCGA32.52WG	○	○		●	●																.375	.156	.0313	.015	.1732	
Mini Tip 	NU-CCGA21.50.5	NU-CCGW060202																				.250	.094	.0078	.015	.110	
	NU-CCGA21.50.5HS*	NU-CCGW060202HS																					.250	.094	.0078	.015	.110
	NU-CCGA21.50.5LT*	NU-CCGW060202LT																					.250	.094	.0078	.015	.110
	NU-CCGA21.51	NU-CCGW060204																					.250	.094	.0156	.015	.110
	NU-CCGA21.51HS*	NU-CCGW060204HS																					.250	.094	.0156	.015	.110
	NU-CCGA21.51LT*	NU-CCGW060204LT																					.250	.094	.0156	.015	.110
	NU-CCGA21.52	NU-CCGW060208																					.250	.094	.0313	.015	.110
	NU-CCGA21.52LT*	NU-CCGW060208LT																					.250	.094	.0313	.015	.110
	NU-CCGA32.50.5	NU-CCGW09T302																					.375	.156	.0078	.015	.1732
	NU-CCGA32.50.5HS*	NU-CCGW09T302HS																					.375	.156	.0078	.015	.1732
	NU-CCGA32.50.5LT*	NU-CCGW09T302LT																					.375	.156	.0078	.015	.1732
	NU-CCGA32.51	NU-CCGW09T304																					.375	.156	.0156	.015	.1732
	NU-CCGA32.51HS*	NU-CCGW09T304HS																					.375	.156	.0156	.015	.1732
	NU-CCGA32.51LT*	NU-CCGW09T304LT																					.375	.156	.0156	.015	.1732
NU-CCGA32.52	2NU-CCGW09T308																					.375	.156	.0313	.015	.1732	
NU-CCGA32.52HS*	2NU-CCGW09T308HS																					.375	.156	.0313	.015	.1732	
NU-CCGA32.52LT*	2NU-CCGW09T308LT*																					.375	.156	.0313	.015	.1732	
Multi-Mini Tip 	2NU-CCGA21.50.5	2NU-CCGW060202																				.250	.094	.0078	.015	.110	
	2NU-CCGA21.50.5WG	2NU-CCGW060202WG																					.250	.094	.0156	.015	.110
	2NU-CCGA21.51	2NU-CCGW060204																					.250	.094	.0156	.015	.110
	2NU-CCGA21.51WG	2NU-CCGW060204WG																					.250	.094	.0156	.015	.110
	2NU-CCGA21.52	2NU-CCGW060208																					.250	.094	.0313	.015	.110
	2NU-CCGA21.52WG	2NU-CCGW060208WG																					.250	.094	.0313	.015	.110
	2NU-CCGA32.50.5WG	2NU-CCGW09T302WG																					.250	.094	.0313	.015	.110
	2NU-CCGA32.51	2NU-CCGW09T304																					.375	.156	.0156	.015	.1732
	2NU-CCGA32.51W	2NU-CCGW09T304W																					.375	.156	.0156	.015	.1732
	2NU-CCGA32.51WG	2NU-CCGW09T304WG																					.375	.156	.0156	.015	.1732
	2NU-CCGA32.52	2NU-CCGW09T308																					.375	.156	.0313	.015	.1732
	2NU-CCGA32.52LT	2NU-CCGW09T308LT																					.375	.156	.0313	.015	.1732
	2NU-CCGA32.52W	2NU-CCGW09T308W																					.375	.156	.0313	.015	.1732
	2NU-CCGA32.52WG	2NU-CCGW09T308WG																					.375	.156	.0313	.015	.1732
2NU-CCGA431	2NU-CCGW120404																					.500	.1875	.0156	.015	.2165	
2NU-CCGA432	2NU-CCGW120408																					.500	.1875	.0313	.015	.2165	

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



CC

80° Diamond Type


7° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

PCBN & PCD Inserts



			Coated		Uncoated							Dimensions														
			H	K	H			K		S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter										
CCGE			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter	
Mini Tip		Catalog No.	ISO Cat. No.																							
		NU-CCGE621	NU-CCGW040104																			.1875	.062	.0156	.015	-
		NU-CCGE621HS*	NU-CCGW040104HS												★	●						.1875	.062	.0156	.015	-
		NU-CCGE622	NU-CCGW040108																			.1875	.062	.0313	.015	-
		NU-CCGE622HS*	NU-CCGW040108HS											★	●					.1875	.062	.0313	.015	-		

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.

CP

80° Diamond Type

11° Relief

			Coated		Uncoated							Dimensions															
			H	K	H			K		S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Dia. (ød1)											
CPGA			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Dia. (ød1)		
Mini Tip		Catalog No.	ISO Cat. No.																								
		NU-CPGA2.51.50.5	NU-CPGW080202																			.3125	.094	.0078	.015	.134	
		NU-CPGA2.51.50.5HS*	NU-CPGW080202HS												★	●						.3125	.094	.0078	.015	.134	
		NU-CPGA2.51.51	NU-CPGW080204													●	●					.3125	.094	.0156	.015	.134	
		NU-CPGA2.51.51HS*	NU-CPGW080204HS												★	●						.3125	.094	.0156	.015	.134	
		NU-CPGA2.51.51LT*	NU-CPGW080204LT													★	●					.3125	.094	.0156	.015	.134	
		NU-CPGA2.51.52	NU-CPGW080208														●	●				.3125	.094	.0313	.015	.134	
		NU-CPGA2.51.52HS*	NU-CPGW080208HS													★	●					.3125	.094	.0313	.015	.134	
		NU-CPGA320.5	NU-CPGW090302															●	●			.375	.125	.0078	.015	.1732	
		NU-CPGA320.5HS*	NU-CPGW090302HS															★	●			.375	.125	.0078	.015	.1732	
		NU-CPGA320.5LT*	NU-CPGW090302LT															★	●			.375	.125	.0078	.015	.1732	
		NU-CPGA321	NU-CPGW090304																●	●			.375	.125	.0156	.015	.1732
		NU-CPGA321HS*	NU-CPGW090304HS													★	●					.375	.125	.0156	.015	.1732	
		NU-CPGA321LT*	NU-CPGW090304LT													★	●					.375	.125	.0156	.015	.1732	
		NU-CPGA322	NU-CPGW090308														★	★					.375	.125	.0313	.015	.1732
		NU-CPGA322HS*	NU-CPGW090308HS													★	★					.375	.125	.0313	.015	.1732	
		NU-CPGA322LT*	NU-CPGW090308LT													★	★					.375	.125	.0313	.015	.1732	
		Multi-Mini Tip		2NU-CPGA32.51	2NU-CPGW09T304													●	●			.375	.156	.0156	.015	.1732	
2NU-CPGA32.52	2NU-CPGW09T308																●	●			.375	.156	.0313	.015	.1732		

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



Cubic Boron Nitride (PCBN) Inserts

See pages 562 - 563 for running parameters.

PCBN

INSERTS - POSITIVE

DCGA • DCGD

DC

55° Diamond Type

7° Relief

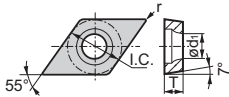
- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

*EDGE PREPARATIONS:

Please see page 555 for descriptions and performance ranges of CBN edge treatments.

DCGA DCGD



	Catalog No.	ISO Cat. No.	Coated												Uncoated								Dimensions						
			H						K						H				K				Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Dia. (ødt)		
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNCX10	BNCX20	BNCX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BNS800	BN7500	S	M							
Coated Mini Tip	2NC-DCGA21.50.5	2NC-DCGW070202	○	○																				.250	.094	.0078	.015	.110	
	2NC-DCGA21.50.5WG	2NC-DCGW070202WG	○	○																					.250	.094	.0156	.015	.110
	2NC-DCGA21.51	2NC-DCGW070204	○	○	●	●	●		★																.250	.094	.0156	.015	.110
	2NC-DCGA21.51LS*	2NC-DCGW070204LS	○	○	●	●	●																		.250	.094	.0156	.015	.110
	2NC-DCGA21.51WG	2NC-DCGW070204WG	○	○	●	●	●																		.250	.094	.0156	.015	.110
	2NC-DCGA21.52WG	2NC-DCGW070208WG	○	○																					.250	.094	.0156	.015	.110
	2NC-DCGA32.50.5	2NC-DCGW11T302	○	○	●	●	●		★																.375	.156	.0078	.015	.1732
	2NC-DCGA32.50.5WG	2NC-DCGW11T302WG	○	○	●	●	●																		.375	.156	.0078	.015	.1732
	2NC-DCGA32.51	2NC-DCGW11T304	○	○	●	●	●		★																.375	.156	.0156	.015	.1732
	2NC-DCGA32.51LS*	2NC-DCGW11T304LS	○	○	●	●	●																		.375	.156	.0156	.015	.1732
	2NC-DCGA32.51WG	2NC-DCGW11T304WG	○	○	●	●	●																		.375	.156	.0156	.015	.1732
	2NC-DCGA32.52	2NC-DCGW11T308	○	○	●	●	●		★																.375	.156	.0313	.015	.1732
	2NC-DCGA32.52LS*	2NC-DCGW11T308LS	○	○	●	●	●																		.375	.156	.0313	.015	.1732
	2NC-DCGA32.52WG	2NC-DCGW11T308WG	○	○	●	●	●																		.375	.156	.0313	.015	.1732
	Mini Tip	NU-DCGD21.50.5	NU-DCGW070202												●										.250	.094	.0078	.015	.110
		NU-DCGD21.51	NU-DCGW070204												●											.250	.094	.0156	.015
NU-DCGA21.50.5		NU-DCGW070202												●											.250	.094	.0078	.015	.110
NU-DCGA21.50.5HS*		NU-DCGW070202HS												●											.250	.094	.0078	.015	.110
NU-DCGA21.50.5LT*		NU-DCGW070202LT												●											.250	.094	.0078	.015	.110
NU-DCGA21.51		NU-DCGW070204												●											.250	.094	.0156	.015	.110
NU-DCGA21.51HS*		NU-DCGW070204HS												●											.250	.094	.0156	.015	.110
NU-DCGA21.51LT*		NU-DCGW070204LT												●											.250	.094	.0156	.015	.110
NU-DCGA21.52		NU-DCGW070208												●											.250	.094	.0313	.015	.110
NU-DCGA21.52LT*		NU-DCGW070208LT												●											.250	.094	.0313	.015	.110
NU-DCGA32.50.5		NU-DCGW11T302												●											.375	.156	.0078	.015	.1732
NU-DCGA32.50.5HS*		NU-DCGW11T302HS												●											.375	.156	.0078	.015	.1732
NU-DCGA32.50.5LT*		NU-DCGW11T302LT												●											.375	.156	.0078	.015	.1732
NU-DCGA32.51		NU-DCGW11T304							▲					●											.375	.156	.0156	.015	.1732
NU-DCGA32.51HS*		NU-DCGW11T304HS												●											.375	.156	.0156	.015	.1732
NU-DCGA32.51LT*		NU-DCGW11T304LT												●											.375	.156	.0156	.015	.1732
NU-DCGA32.52		NU-DCGW11T308												●											.375	.156	.0313	.015	.1732
NU-DCGA32.52LS*		NU-DCGW11T308LS												●											.375	.156	.0313	.015	.1732
NU-DCGA32.52LE*		NU-DCGW11T308LE												●											.375	.156	.0313	.015	.1732
NU-DCGA32.53	NU-DCGW11T312												●											.375	.156	.0469	.015	.1732	
NU-DCGA32.53LT*	NU-DCGW11T312LT												●											.375	.156	.0469	.015	.1732	
Multi-Mini Tip	2NU-DCGA21.50.5	2NU-DCGW070202													●	●								.250	.094	.0078	.015	.110	
	2NU-DCGA21.50.5WG	2NU-DCGW070202WG													●	●								.250	.094	.0156	.015	.110	
	2NU-DCGA21.51	2NU-DCGW070204											●			●	●								.250	.094	.0156	.015	.110
	2NU-DCGA21.51W	2NU-DCGW070204W											●			●	●								.250	.094	.0156	.015	.110
	2NU-DCGA21.51WG	2NU-DCGW070204WG											●			●	●								.250	.094	.0156	.015	.110
	2NU-DCGA21.52	2NU-DCGW070208											●			●	●								.250	.094	.0313	.015	.110
	2NU-DCGA21.52WG	2NU-DCGW070208WG											●			●	●								.250	.094	.0313	.015	.110
	2NU-DCGA32.50.5	2NU-DCGW11T302														●	●								.375	.156	.0078	.015	.1732
	2NU-DCGA32.50.5LS*	2NU-DCGW11T302LS														●	●								.375	.156	.0078	.015	.1732
	2NU-DCGA32.50.5LE*	2NU-DCGW11T302LE														●	●								.375	.156	.0078	.015	.1732
	2NU-DCGA32.50.5LF*	2NU-DCGW11T302LF														●	●								.375	.156	.0078	.015	.1732
	2NU-DCGA32.50.5WG	2NU-DCGW11T302WG												●			●	●							.375	.156	.0078	.015	.1732
	2NU-DCGA32.51	2NU-DCGW11T304											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.51LS*	2NU-DCGW11T304LS											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.51LE*	2NU-DCGW11T304LE											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.51LF*	2NU-DCGW11T304LF											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.51W	2NU-DCGW11T304W											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.51WG	2NU-DCGW11T304WG											●			●	●								.375	.156	.0156	.015	.1732
	2NU-DCGA32.52	2NU-DCGW11T308											●			●	●								.375	.156	.0313	.015	.1732
	2NU-DCGA32.52LS*	2NU-DCGW11T308LS											●			●	●								.375	.156	.0313	.015	.1732
	2NU-DCGA32.52LE*	2NU-DCGW11T308LE											●			●	●								.375	.156	.0313	.015	.1732
	2NU-DCGA32.52LF*	2NU-DCGW11T308LF											●			●	●								.375	.156	.0313	.015	.1732
	2NU-DCGA32.52W	2NU-DCGW11T308W											●			●	●								.375	.156	.0313	.015	.1732
	2NU-DCGA32.52WG	2NU-DCGW11T308WG											●			●	●								.375	.156	.0313	.015	.1732

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



***EDGE PREPARATIONS:**

Please see page 555 for descriptions and performance ranges of CBN edge treatments.

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

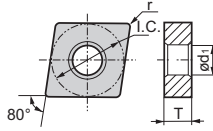
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

DC

55° Diamond Type

7° Relief

DCGT



			Coated		Uncoated						Dimensions												
	H	K	H	K	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Dia. (g.d.)												
	BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BAX10	BAX20	BAX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BNS800	BN7500					
Coated Mini Tip	2NCDCGT21.50.5FV	2NC-DCGT070202N-FV	○	○	●	●													.250	.094	.0078	.015	.110
	2NCDCGT21.51FV	2NC-DCGT070204N-FV	○	○	●	●													.250	.094	.0156	.015	.110
	2NCDCGT21.52FV	2NC-DCGT070208N-FV	○	○	●	●													.250	.094	.0313	.015	.110
	2NCDCGT32.50.5LV	2NC-DCGT11T302N-FV	○	○	●	●													.375	.156	.0078	.015	.1732
	2NCDCGT32.51LV	2NC-DCGT11T304N-FV	○	○	●	●													.375	.156	.0156	.015	.1732
	2NCDCGT32.52LV	2NC-DCGT11T308N-FV	○	○	●	●													.375	.156	.0313	.015	.1732
Mini Tip	2NUDCGT21.50.5FV	2NU-DCGT070202N-FV										●							.250	.094	.0078	.015	.110
	2NUDCGT32.50.5FV	2NU-DCGT11T302N-FV										●							.375	.156	.0078	.015	.1732
	2NUDCGT32.50.5LV	2NU-DCGT11T302N-LV										●							.375	.156	.0078	.015	.1732
	2NUDCGT32.51LV	2NU-DCGT11T304N-LV										●							.375	.156	.0156	.015	.1732
	2NUDCGT32.52LV	2NU-DCGT11T308N-LV										●							.375	.156	.0313	.015	.1732

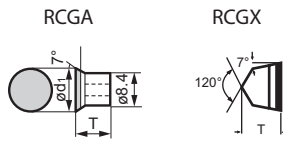
Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.

RC

Round Type

7° Relief

RCGA RCGX



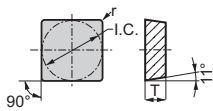
			Coated		Uncoated						Dimensions												
	H	K	H	K	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter												
	BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BAX10	BAX20	BAX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BNS800	BN7500					
Full Tip	RCGA	RCGX	RCGA094	RCGX0906MO									★						.354	.250	-	.040	-
			RCGX25	RCGX060700											●				.250	.309	-	.040	-
			RCGX35	RCGX090700											●				.375	.309	-	.040	-
			RCGX45	RCGX120700											●				.500	.312	-	.040	-

SP

Square Type

11° Relief

SPG



			Coated		Uncoated						Dimensions												
	H	K	H	K	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter												
	BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BAX10	BAX20	BAX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BNS800	BN7500					
Full Tip	SPG322	SPGN090308											●						.375	.125	.0313	.020	-
	SPG421	SPGN120304																	.500	.125	.0156	.020	-
Mini Tip	NU-SPG321	NU-SPGN090304											●						.375	.125	.0156	.015	-
	NU-SPG321HS*	NU-SPGN090304HS											★						.375	.125	.0156	.015	-
	NU-SPG321LT*	NU-SPGN090304LT											★						.375	.125	.0156	.015	-
	NU-SPG322	NU-SPGN090308											●						.375	.125	.0313	.015	-
	NU-SPG322HS*	NU-SPGN090308HS											★						.375	.125	.0313	.015	-
	NU-SPG322LT*	NU-SPGN090308LT											★						.375	.125	.0313	.015	-

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



Cubic Boron Nitride (PCBN) Inserts

See pages 562 - 563 for running parameters.

PCBN

INSERTS - POSITIVE

SPGA • TBGE • TCGA

PCBN & PCD
Inserts

SP

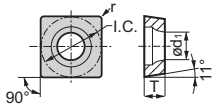
Square Type

11° Relief

- K Cast Iron
- S Exotic Materials
- H Hardened Steel
- S_M Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

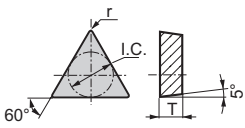
	SPGA		Coated		Uncoated					Dimensions															
			H		K	H			K	S	S	S	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter								
			BNC80	BNC100	BNC150	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500
Full Tip	SPGA321	SPGW090304																			.375	.125	.0156	.020	.130
	SPGA322	SPGW090308																				.375	.125	.0313	.020

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.

TB

60° Triangle Type

5° Relief

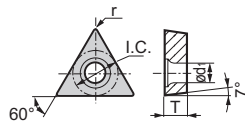
	TBGE		Coated		Uncoated					Dimensions																	
			H		K	H			K	S	S	S	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter										
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500		
Full Top	TBGE520.5B	TBGE060102B																				.156	.0625	.0078	.020	-	
	TBGE520.5BSN	TBGE060102-BSN																					.156	.0625	.0078	.020	-
	TBGE521B	TBGE060104B																					.156	.0625	.0156	.020	-
	TBGE522B	TBGE060108B																					.156	.0625	.0313	.020	-

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.
BSN = Light edge preparation

TC

60° Triangle Type

7° Relief

	TCGA		Coated		Uncoated					Dimensions																			
			H		K	H			K	S	S	S	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter												
			BNC160	BNC200	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500				
Coated Mini Tip	3NU-TCGA21.51	3NU-TCGW110204																					.250	.094	.0156	.015	.110		
	3NU-TCGA21.52	3NU-TCGW110208																						.250	.094	.0313	.015	.110	
	3NU-TCGA32.51	3NU-TCGW160204																						.375	.1875	.0156	.015	.1693	
	3NU-TCGA32.52	3NU-TCGW160208																							.375	.1875	.0313	.015	.1693
	3NC-TCGA32.52	3NC-TCGW160208																											
Multi-Mini Tip	NC-TCGA21.51	NC-TCGW110204	○	○	●	●	●																	.250	.094	.0156	.015	.110	
	NC-TCGA21.52	NC-TCGW110208	○	○	●	●	●																		.250	.094	.0313	.015	.110

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



TP

60° Triangle Type

11° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

TPEE			Coated		Uncoated					Dimensions																
			H		K	H			K	S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter										
			BNC80	BNC100	BNC150	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20						BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN5800	BN7500
	Catalog No.	ISO Cat. No.																								
	TPEE632B	TPEE080208B																				.1875	.094	.0313	.020	-
TPEE632BH	TPEE080208BH																					.1875	.094	.0313	.020	-

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.
H = Hone only

TPG			Coated		Uncoated					Dimensions																
			H		K	H			K	S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter										
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20						BNX25	BN1000	BN2000	BN250	BN350	BN7000	BN700	BN5800	BN7500	
	Catalog No.	ISO Cat. No.																								
	TPG1.81.51	TPGN090204																				.219	.094	.0156	.020	-
	TPG1.81.51HS*	TPGN090204HS																				.219	.094	.0156	.020	-
	TPG221	TPGN110304																				.250	.125	.0156	.020	-
	TPG221HS*	TPGN110304HS																				.250	.125	.0156	.020	-
	TPG222	TPGN110308																				.250	.125	.0313	.020	-
	TPG222HS*	TPGN110308HS																				.250	.125	.0313	.020	-
	TPG321	TPGN160304																				.375	.125	.0156	.020	-
	TPG321HS*	TPGN160304HS																				.375	.125	.0156	.020	-
	TPG322	TPGN160308																				.375	.125	.0313	.020	-
	TPG322HS*	TPGN160308HS																				.375	.125	.0313	.020	-
	TPG323	TPGN160312																				.375	.125	.0469	.020	-
	TPG432	TPGN220408																				.500	.1875	.0313	.020	-
	TPG432HS*	TPGN220408HS																				.500	.1875	.0313	.020	-
	3NU-TPG221	3NU-TPGN110304																			.250	.125	.0156	.015	-	
	3NU-TPG222	3NU-TPGN110308																			.250	.125	.0313	.015	-	
	3NU-TPG321	3NU-TPGN160304																			.375	.125	.0156	.015	-	
	3NU-TPG322	3NU-TPGN160308																			.375	.125	.0313	.015	-	
	NU-TPG220.5	NU-TPGN110302																			.250	.125	.0078	.015	-	
	NU-TPG220.5LT*	NU-TPGN110302LT																				.250	.125	.0078	.015	-
	NU-TPG221	NU-TPGN110304																			.250	.125	.0156	.015	-	
	NU-TPG221HS*	NU-TPGN110304HS																			.250	.125	.0156	.015	-	
	NU-TPG221LT*	NU-TPGN110304LT																			.250	.125	.0156	.015	-	
	NU-TPG222	NU-TPGN110308																			.250	.125	.0313	.015	-	
	NU-TPG222HS*	NU-TPGN110308HS																			.250	.125	.0313	.015	-	
	NU-TPG222LT*	NU-TPGN110308LT																			.250	.125	.0313	.015	-	
	NU-TPG320.5	NU-TPGN160302																			.375	.125	.0078	.015	-	
	NU-TPG321	NU-TPGN160304																			.375	.125	.0156	.015	-	
	NU-TPG321HS*	NU-TPGN160304HS																			.375	.125	.0156	.015	-	
	NU-TPG321LT*	NU-TPGN160304LT																			.375	.125	.0156	.015	-	
	NU-TPG322	NU-TPGN160308																			.375	.125	.0313	.015	-	
	NU-TPG322HS*	NU-TPGN160308HS																			.375	.125	.0313	.015	-	
NU-TPG322LT*	NU-TPGN160308LT																			.375	.125	.0313	.015	-		

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



Cubic Boron Nitride (PCBN) Inserts

See pages 562 - 563 for running parameters.

PCBN

INSERTS - POSITIVE

TPGA • TPGD • TPGX

TP

60° Triangle Type

11° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

	TPGA TPGD TPGX		Coated											Uncoated						Dimensions				
			H					K	H					K	S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter			
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BAN10	BNX20	BNX25	BN1000	BN2000	BN250	BN350						BN7000	BN700	BNS800
Coated Mini Tip			NC-TPGA221	NC-TPGW110304	○	○	●	●	●											.250	.125	.0156	.015	.130
			NC-TPGA222	NC-TPGW110308	○	○	●	●	●											.250	.125	.0313	.015	.130
			3NC-TPGA1.81.50.5	3NC-TPGW090202																.219	.094	.0078	.015	.102
			3NC-TPGA1.81.51	3NC-TPGW090204																.219	.094	.0156	.015	.102
			3NC-TPGA221	3NC-TPGW110304		○			●											.250	.125	.0156	.015	.130
			3NC-TPGA221LS	3NC-TPGW110304LS	○	○	★	●	●											.250	.125	.0156	.015	.130
			3NC-TPGA222	3NC-TPGW110308		○			●											.250	.125	.0313	.015	.130
			3NC-TPGA222LS	3NC-TPGW110308LS		○			●											.250	.125	.0313	.015	.130
			3NC-TPGA331	3NC-TPGW160404	○	○	●	●	★			●								.375	.1875	.0156	.015	.1693
			3NC-TPGA331LS	3NC-TPGW160404LS	○	○	★		★											.375	.1875	.0156	.015	.1693
			3NC-TPGA332	3NC-TPGW160408	○	○	●	●	●			●								.375	.1875	.0313	.015	.1693
		3NC-TPGA332LS	3NC-TPGW160408LS		○			★											.375	.1875	.0313	.015	.1693	
Full Tip			TPGA221	TPGW110304															.250	.125	.0156	.020	.130	
			TPGA221HS*	TPGW110304HS															.250	.125	.0156	.020	.130	
			TPGA222	TPGW110308															.250	.125	.0313	.020	.130	
			TPGA222HS*	TPGW110308HS															.250	.125	.0313	.020	.130	
			TPGA331	TPGW160404															.375	.1875	.0156	.020	.1693	
			TPGA331HS*	TPGW160404HS															.375	.1875	.0156	.020	.1693	
			TPGA332	TPGW160408															.375	.1875	.0313	.020	.1693	
Multi-Mini Tip			TPGA332HS*	TPGW160408HS															.375	.1875	.0313	.020	.1693	
			3NU-TPGA21.51	3NU-TPGW110204												●	●	●	.250	.094	.0156	.015	.110	
			3NU-TPGA21.51LS*	3NU-TPGW110204LS												●	●	●	.250	.094	.0156	.015	.110	
			3NU-TPGA21.51LE*	3NU-TPGW110204LE												●	●	●	.250	.094	.0156	.015	.110	
			3NU-TPGA21.51LF*	3NU-TPGW110204LF												●	●	●	.250	.094	.0156	.015	.110	
			3NU-TPGA21.52	3NU-TPGW110208												●	●	●	.250	.094	.0313	.015	.110	
			3NU-TPGA220.5	3NU-TPGW110302												●	●	●	.250	.125	.0078	.015	.130	
			3NU-TPGA220.5LF*	3NU-TPGW110302LF												●	●	●	.250	.125	.0078	.015	.130	
			3NU-TPGA221	3NU-TPGW110304												●	●	●	.250	.125	.0156	.015	.130	
			3NU-TPGA221LS*	3NU-TPGW110304LS												●	●	●	.250	.125	.0156	.015	.130	
			3NU-TPGA221LE*	3NU-TPGW110304LE												●	●	●	.250	.125	.0156	.015	.130	
			3NU-TPGA221LF*	3NU-TPGW110304LF												●	●	●	.250	.125	.0156	.015	.130	
			3NU-TPGA222	3NU-TPGW110308												●	●	●	.250	.125	.0313	.015	.130	
			3NU-TPGA222LF*	3NU-TPGW110308LF												●	●	●	.250	.125	.0313	.015	.130	
		3NU-TPGA331	3NU-TPGW160404												●	●	●	.375	.1875	.0156	.015	.1693		
		3NU-TPGA332	3NU-TPGW160408												●	●	●	.375	.1875	.0313	.015	.1693		
Mini-Tip			NU-TPGX21.50.5	NU-TPGW110202															.250	.094	.0078	.015	.110	
			NU-TPGX21.51	NU-TPGW110204															.250	.094	.0156	.015	.110	
			NU-TPGX21.51S	NU-TPGW110204S															.250	.094	.0156	.015	.110	
			NU-TPGD630.5	NU-TPGW080202												●	●	●	.094	.1875	.0078	.015	.090	
			NU-TPGD630.5HS*	NU-TPGW080202HS												●	●	●	.094	.1875	.0078	.015	.090	
			NU-TPGD630.5LT*	NU-TPGW080202LT												●	●	●	.094	.1875	.0078	.015	.090	
			NU-TPGD630.5S	NU-TPGW080202S												●	●	●	.094	.1875	.0078	.015	.090	
			NU-TPGD631	NU-TPGW080204												●	●	●	.094	.1875	.0156	.015	.090	
			NU-TPGD631HS*	NU-TPGW080204HS												●	●	●	.094	.1875	.0156	.015	.090	
			NU-TPGD631LT*	NU-TPGW080204LT												●	●	●	.094	.1875	.0156	.015	.090	
			NU-TPGD631S	NU-TPGW080204S												●	●	●	.094	.1875	.0156	.015	.090	
			NU-TPGD632	NU-TPGW080208												●	●	●	.094	.1875	.0313	.015	.090	

S = Edge preparation for hardened steel boring

PCBN & PCD Inserts



TP

60° Triangle Type

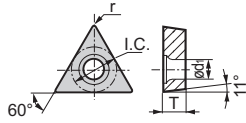
11° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

**TPGA
TPGD
TPGX**
(cont.)



PCBN & PCD Inserts

Mini-Tip



Catalog No.	ISO Cat. No.	Coated										Uncoated							Dimensions							
		H					K	H					K	S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter						
		BNC2010	BNC2010	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350						BN7000	BN700	BN5800	BN7500		
NU-TPGD632HS*	NU-TPGW080208HS																				.094	.1875	.0313	.015	.090	
NU-TPGA1.81.50.5	NU-TPGW090202																					.219	.094	.0078	.015	.102
NU-TPGA1.81.50.5HS*	NU-TPGW090202HS																					.219	.094	.0078	.015	.102
NU-TPGA1.81.50.5LT*	NU-TPGW090202LT																					.219	.094	.0078	.015	.102
NU-TPGA1.81.51	NU-TPGW090204																					.219	.094	.0156	.015	.102
NU-TPGA1.81.51HS*	NU-TPGW090204HS																					.219	.094	.0156	.015	.102
NU-TPGA1.81.51LT*	NU-TPGW090204LT																					.219	.094	.0156	.015	.102
NU-TPGA1.81.52	NU-TPGW090208																					.219	.094	.0313	.015	.102
NU-TPGA21.50.5	NU-TPGW110202																					.219	.094	.0078	.015	.102
NU-TPGA21.50.5LT*	NU-TPGW110202LT																					.219	.094	.0078	.015	.102
NU-TPGA21.51	NU-TPGW110204																					.219	.094	.0156	.015	.102
NU-TPGA21.51HS*	NU-TPGW110204HS																					.219	.094	.0156	.015	.102
NU-TPGA21.51LT*	NU-TPGW110204LT																					.219	.094	.0156	.015	.102
NU-TPGA220.5	NU-TPGW110302																					.250	.125	.0078	.015	.130
NU-TPGA220.5HS*	NU-TPGW110302HS																					.250	.125	.0078	.015	.130
NU-TPGA220.5LT*	NU-TPGW110302LT																					.250	.125	.0078	.015	.130
NU-TPGA221	NU-TPGW110304																					.250	.125	.0156	.015	.130
NU-TPGA221HS*	NU-TPGW110304HS																					.250	.125	.0156	.015	.130
NU-TPGA221LT*	NU-TPGW110304LT																					.250	.125	.0156	.015	.130
NU-TPGA221S	NU-TPGW110304LT																					.250	.125	.0156	.015	.130
NU-TPGA222	NU-TPGW110308																					.250	.125	.0313	.015	.130
NU-TPGA222HS*	NU-TPGW110308HS																					.250	.125	.0313	.015	.130
NU-TPGA222LT*	NU-TPGW110308LT																					.250	.125	.0313	.015	.130
NU-TPGA222S	NU-TPGW110308S																					.250	.125	.0313	.015	.130
NU-TPGA320.5	NU-TPGW160302																					.375	.125	.0078	.015	.1693
NU-TPGA321	NU-TPGW160304																					.375	.125	.0156	.015	.1693
NU-TPGA322	NU-TPGW160308																					.375	.125	.0313	.015	.1693
NU-TPGA331	NU-TPGW160404																					.375	.1875	.0156	.015	.1693
NU-TPGA331HS*	NU-TPGW160404HS																					.375	.1875	.0156	.015	.1693
NU-TPGA331LT*	NU-TPGW160404LT																					.375	.1875	.0156	.015	.1693
NU-TPGA331S	NU-TPGW160404S																					.375	.1875	.0156	.015	.1693
NU-TPGA332	NU-TPGW160408																					.375	.1875	.0313	.015	.1693
NU-TPGA332HS*	NU-TPGW160408HS																					.375	.1875	.0313	.015	.1693
NU-TPGA332LT*	NU-TPGW160408LT																					.375	.1875	.0313	.015	.1693
NU-TPGA332S	NU-TPGW160408S																					.375	.1875	.0313	.015	.1693

S = Edge preparation for hardened steel boring



Cubic Boron Nitride (PCBN) Inserts

See pages 562 - 563 for running parameters.

PCBN

INSERTS - POSITIVE

VBGA

VB

35° Diamond Type

5° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**

Please see page 555 for descriptions and performance ranges of CBN edge treatments.

PCBN & PCD Inserts

<div style="text-align: center;"> </div>			Coated		Uncoated							Dimensions												
			H		K	H			K		S	S _M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter							
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BAX10	BAX20	BAX25						BW1000	BW2000	BW250	BW350	BW7000	BW700	BWS800
Coated Mini-Tip		2NC-VBGA221	2NC-VBGW110304	○	○	●	●	●	●	★									.250	.125	.0156	.015	.134	
		2NC-VBGA221LS*	2NC-VBGW110304LS			●														.250	.125	.0156	.015	.134
		2NC-VBGA222	2NC-VBGW110308		○															.250	.125	.0313	.015	.134
		2NC-VBGA331	2NC-VBGW160404		○															.375	.1875	.0156	.015	.1732
		2NC-VBGA332	2NC-VBGW160408		○															.375	.1875	.0313	.015	.1732
Multi-Mini Tip		2NU-VBGA221	2NU-VBGW110304											●	●				.250	.125	.0156	.015	.134	
		2NU-VBGA222	2NU-VBGW110308												●	●			.250	.125	.0313	.015	.134	
		2NU-VBGA331	2NU-VBGW160404												●				.375	.1875	.0156	.015	.1732	
		2NU-VBGA332	2NU-VBGW160408												●				.375	.1875	.0313	.015	.1732	
Mini-Tip		NU-VBGA220.5	NU-VBGA110302											●					.250	.125	.0078	.015	.134	
		NU-VBGA220.5HS*	NU-VBGA110302HS												●					.250	.125	.0078	.015	.134
		NU-VBGA220.5LT*	NU-VBGA110302LT													●				.250	.125	.0078	.015	.134
		NU-VBGA221	NU-VBGA110304												●					.250	.125	.0156	.015	.134
		NU-VBGA221HS*	NU-VBGA110304HS												●					.250	.125	.0156	.015	.134
		NU-VBGA221LT*	NU-VBGA110304LT												●					.250	.125	.0156	.015	.134
		NU-VBGA222	NU-VBGA110308												●					.250	.125	.0313	.015	.134
		NU-VBGA222HS*	NU-VBGA110308HS												●					.250	.125	.0313	.015	.134
		NU-VBGA222LT*	NU-VBGA110308LT												●					.250	.125	.0313	.015	.134
		NU-VBGA330.5	NU-VBGA160402												●					.375	.1875	.0078	.015	.1732
		NU-VBGA330.5LT*	NU-VBGA160402LT												●					.375	.1875	.0078	.015	.1732
		NU-VBGA331	NU-VBGA160404												●					.375	.1875	.0156	.015	.1732
		NU-VBGA331HS*	NU-VBGA160404HS												●					.375	.1875	.0156	.015	.1732
		NU-VBGA331LT*	NU-VBGA160404LT												●					.375	.1875	.0156	.015	.1732
		NU-VBGA332	NU-VBGA160408												●					.375	.1875	.0313	.015	.1732
		NU-VBGA332HS*	NU-VBGA160408HS												●					.375	.1875	.0313	.015	.1732
		NU-VBGA332LT*	NU-VBGA160408LT												●					.375	.1875	.0313	.015	.1732

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



VC

35° Diamond Type

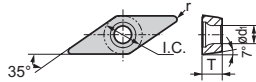
7° Relief

- K** Cast Iron
- S** Exotic Materials
- H** Hardened Steel
- S_M** Sintered Materials

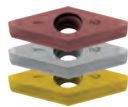
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

***EDGE PREPARATIONS:**
Please see page 555 for descriptions and performance ranges of CBN edge treatments.

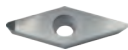
VCGA



Coated Mini Tip



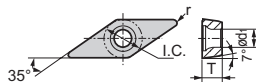
Mini Tip



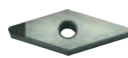
	Catalog No.	ISO Cat. No.	Coated		Uncoated					Dimensions											
			H		K	H			K	S	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter				
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350
2NC-VCGA331	2NC-VCGW160404		○	○													.375	.1875	.0156	.015	.1732
2NC-VCGA331LS*	2NC-VCGW160404LS		○	★	★												.375	.1875	.0156	.015	.1732
2NC-VCGA331HS*	2NC-VCGW160404HS		○	○	★												.375	.1875	.0156	.015	.1732
2NC-VCGA332	2NC-VCGW160408		○	○	●	●											.375	.1875	.0313	.015	.1732
2NC-VCGA332LS*	2NC-VCGW160408LS		○	★	★												.375	.1875	.0313	.015	.1732
2NC-VCGA332HS*	2NC-VCGW160408HS		○	○	★												.375	.1875	.0313	.015	.1732
NU-VCGA1.51.50.5	NU-VCGW080202												★				.1874	.094	.0078	.015	.091
NU-VCGA1.51.50.5LT*	NU-VCGW080202LT												★				.1874	.094	.0078	.015	.091
NU-VCGA1.51.51	NU-VCGW080204												★				.1874	.094	.0156	.015	.091
NU-VCGA1.51.51HS*	NU-VCGW080204HS												★				.1874	.094	.0156	.015	.091
NU-VCGA1.51.51LT*	NU-VCGW080204LT												★				.1874	.094	.0156	.015	.091
NU-VCGA1.51.52	NU-VCGW080208												★				.1874	.094	.0313	.015	.091
NU-VCGA1.51.52HS*	NU-VCGW080208HS												★				.1874	.094	.0313	.015	.091
NU-VCGA1.51.52LT*	NU-VCGW080208LT												★				.1874	.094	.0313	.015	.091
NU-VCGA220.5	NU-VCGW110302												●	●			.250	.125	.0078	.015	.134
NU-VCGA220.5HS*	NU-VCGW110302HS												●	●			.250	.125	.0078	.015	.134
NU-VCGA221	NU-VCGW110304												●	★			.250	.125	.0156	.015	.134
NU-VCGA221HS*	NU-VCGW110304												●	●			.250	.125	.0156	.015	.134

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.

VCMA



Full Tip



	Catalog No.	ISO Cat. No.	Coated		Uncoated					Dimensions											
			H		K	H			K	S	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter				
			BNC2010	BNC2020	BNC1500	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350
VCM331	VCMW160404																.375	.1875	.0156	.020	.1732
VCM332	VCMW160404																.375	.1875	.0313	.020	.1732

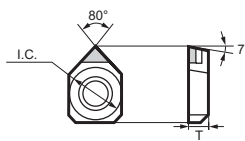
Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.

ZN

80° Special Shape

7° Relief

ZNEX



Full Tip



	Catalog No.	ISO Cat. No.	Coated		Uncoated					Dimensions											
			H		K	H			K	S	S	M	Inscribed Circle	Thickness	Nose Radius	Max. D. O. C.	Hole Diameter				
			BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC300	BNC500	BNX10	BNX20	BNX25						BN1000	BN2000	BN250	BN350
NC-ZNEX620.5	NC-ZNEX040102		○														.1875	.0625	.0078	.015	.090
NC-ZNEX621	NC-ZNEX040104		○														.1875	.0625	.0156	.015	.090
NU-ZNEX620.5	NU-ZNEX040102																.1875	.0625	.0078	.015	.090
NU-ZNEX621	NU-ZNEX040104																.1875	.0625	.0156	.015	.090

Note: Maximum depth of cut is based on hardened steel applications. Other materials may allow for increased maximum depths of cut.



Polycrystalline Diamond (PCD) Inserts

See page 564 for running parameters.

PCD

INSERTS - POSITIVE

VNMX • CCMT

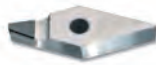

VN


35° Diamond Type
Negative

EDGE PREPARATIONS:

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015


	VNMX	Diagram		Stock				Dimensions					
		35°	10°	DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
		Catalog No.	ISO Cat. No.										
Standard Tip		VNMX331	VNMX160404	●	●	●	●	.375	.1875	.0156	.150	S	10°
		VNMX332	VNMX160408	●	●	●	●	.375	.1875	.0313	.150	S	10°
		VNMX333	VNMX160412	●	●	●	●	.375	.1875	.0469	.150	S	10°
NF Tip		NF-VNMX330.5	NF-VNMX160402		●	●	●	.375	.1875	.0078	.150	S	10°
		NF-VNMX331	NF-VNMX160404		●	●	●	.375	.1875	.0156	.150	S	10°
		NF-VNMX332	NF-VNMX160408		●	●	●	.375	.1875	.0313	.150	S	10°
		NF-VNMX333	NF-VNMX160412		★	●	●	.375	.1875	.0469	.150	S	10°

	VNMX with Chipbreaker	Diagram		Stock					Dimensions					
		35°	Diagram	DA90	DA150	DA200	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
		Catalog No.	ISO Cat. No.											
		NF-VNMX330.5LD	NF-VNMX160402LD				○	○	.375	.1875	.0078	.150	S	0°
		NF-VNMX330.5GD	NF-VNMX160402GD				○	○	.375	.1875	.0078	.150	S	0°
		NF-VNMX331LD	NF-VNMX160404LD				○	○	.375	.1875	.0156	.150	S	0°
		NF-VNMX331GD	NF-VNMX160404GD				○	○	.375	.1875	.0156	.150	S	0°
		NF-VNMX332LD	NF-VNMX160408LD				○	○	.375	.1875	.0312	.150	S	0°
		NF-VNMX332GD	NF-VNMX160408GD				○	○	.375	.1875	.0312	.150	S	0°
		NF-VNMX333LD	NF-VNMX160412LD				○	○	.375	.1875	.0469	.150	S	0°
		NF-VNMX333GD	NF-VNMX160412GD				○	○	.375	.1875	.0469	.150	S	0°

PCD INSERTS - NEGATIVE

CC

80° Diamond Type
7° Relief

	CCMT	Diagram		Stock					Dimensions					
		80°	Diagram	DA90	DA150	DA200	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
		Catalog No.	ISO Cat. No.											
		NF-CCMT21.50.5GD	NF-CCMT060202N-GD				○	○	.250	.094	.0078	.107	S	0°
		NF-CCMT21.50.5LD	NF-CCMT060202N-LD				○	○	.250	.094	.0078	.107	S	0°
		NF-CCMT21.51GD	NF-CCMT060204N-GD				○	○	.250	.094	.0156	.107	S	0°
		NF-CCMT21.51LD	NF-CCMT060204N-LD				○	○	.250	.094	.0156	.107	S	0°
		NF-CCMT32.50.5GD	NF-CCMT09T302N-GD				○	○	.375	.156	.0078	.1732	S	0°
		NF-CCMT32.50.5LD	NF-CCMT09T302N-LD				○	○	.375	.156	.0078	.1732	S	0°
		NF-CCMT32.51GD	NF-CCMT09T304N-GD				○	○	.375	.156	.0156	.1732	S	0°
		NF-CCMT32.51LD	NF-CCMT09T304N-LD				○	○	.375	.156	.0156	.1732	S	0°
		NF-CCMT32.52GD	NF-CCMT09T308N-GD				○	○	.375	.156	.0312	.1732	S	0°
		NF-CCMT32.52LD	NF-CCMT09T308N-LD				○	○	.375	.156	.0312	.1732	S	0°



CC

80° Diamond Type

CC

7° Relief

EDGE PREPARATIONS:

- S Standard
 - H Honed
 - K Reinforced
 - AW Chipbreaker Stud
 - WF High Luster "Mirror-Like" Finish
- USA Stocked Item
 - ★ Worldwide Warehouse Item
 - ▲ USA Limited Availability Item
 - Available 1st Quarter 2015

	Catalog No.	ISO Cat. No.	Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
NF Tip			N									
	NF-CCMX21.50	NF-CCMT060201			●	●	.250	.094	.0039	.110	S	10°
	NF-CCMX21.50.5	NF-CCMT060202			●	●	.250	.094	.0078	.110	S	10°
	NF-CCMX21.51	NF-CCMT060204			●	●	.250	.094	.0156	.110	S	10°
	NF-CCMX32.50.5	NF-CCMT09T302			●	●	.375	.156	.0078	.1732	S	10°
	NF-CCMX32.51	NF-CCMT09T304			●	●	.375	.156	.0156	.1732	S	10°
	NF-CCMX32.52	NF-CCMT09T308			●	●	.375	.156	.0313	.1732	S	10°

CP

80° Diamond Type

CP

11° Relief

	Catalog No.	ISO Cat. No.	Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip			N									
	CPMX2.51.50.5	CPMT080202			●	●	.3125	.094	.0078	.134	S	10°
	CPMX2.51.51	CPMT080204			●	●	.3125	.094	.0156	.134	S	10°
	CPMX2.51.52	CPMT080208			●	●	.3125	.094	.0313	.134	S	10°
	CPMX320.5	CPMT090302			●	●	.375	.125	.0078	.1732	S	10°
	CPMX321	CPMT090304			●	●	.375	.125	.0156	.1732	S	10°
	CPMX322	CPMT090308			●	●	.375	.125	.0313	.1732	S	10°
NF Tip	NF-CPMX21.51	NF-CPMT060204			●	●	.250	.094	.0156	.110	S	10°
	NF-CPMX21.52	NF-CPMT060208			●	●	.250	.094	.0313	.110	S	10°
	NF-CPMX32.51	NF-CPMT09T304			●	●	.375	.156	.0156	.1732	S	10°
	NF-CPMX32.52	NF-CPMT09T308			●	●	.375	.156	.0313	.1732	S	10°
	NF-CPMX320.5	NF-CPMT090302			●	●	.375	.125	.0078	.1732	S	10°
	NF-CPMX321	NF-CPMT090304			●	●	.375	.125	.0156	.1732	S	10°
NF-CPMX322	NF-CPMT090308			●	●	.375	.125	.0313	.1732	S	10°	

	Catalog No.	ISO Cat. No.	Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip			N									
	CPG422	CPGN120308			●	●	.500	.125	.0313	-	S	0°



Polycrystalline Diamond (PCD) Inserts

See page 564 for running parameters.

PCD

INSERTS - POSITIVE

CPGA • CPEW • DCGA • DCMT

CP

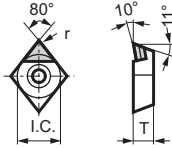

80° Diamond Type

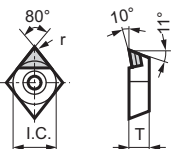

11° Relief

EDGE PREPARATIONS:

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

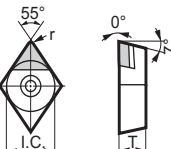

CPGA			Stock				Dimensions						
			N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle	
	Catalog No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200							
NF Tip		NF-CPGA321	NF-CPGW090304			●		.375	.125	.0156	.1732	S	10°
		NF-CPGA322	NF-CPGW090308			●		.375	.125	.0313	.1732	S	10°

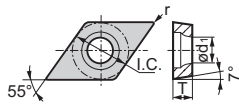
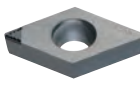
CPEW			Stock				Dimensions						
			N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle	
	Catalog No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200							
Standard Tip		CPEW32.52	CPEW09T308			●		.375	.156	.0313	.1732	S	10°

DC

55° Diamond Type

7° Relief

DCGA			Stock				Dimensions						
			N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle	
	Catalog No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200							
NF Tip		NF-DCGA32.50.5	NF-DCGT11T302			●		.375	.156	.0078	.1732	S	0°
		NF-DCGA32.51	NF-DCGT11T304			●		.375	.156	.0156	.1732	S	0°
		NF-DCGA32.552	NF-DCGT11T308			●		.375	.156	.0156	.1732	S	0°

DCMT			Stock				Dimensions						
			N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle	
	Catalog No.	ISO Cat. No.	DA90	DA150	DA200	DA1000							DA2200
NF Tip		NF-DCMT21.50.5GD	NF-DCMT070202N-GD			○		.250	.094	.0078	.107	S	0°
		NF-DCMT21.50.5LD	NF-DCMT070202N-LD			○		.250	.094	.0078	.107	S	0°
		NF-DCMT21.51GD	NF-DCMT070204N-GD			○		.250	.094	.0156	.107	S	0°
		NF-DCMT21.51LD	NF-DCMT070204N-LD			○		.250	.094	.0156	.107	S	0°
		NF-DCMT32.50.5GD	NF-DCMT11T302N-GD			○		.375	.156	.0078	.1732	S	0°
		NF-DCMT32.50.5LD	NF-DCMT11T302N-LD			○		.375	.156	.0078	.1732	S	0°
		NF-DCMT32.51GD	NF-DCMT11T304N-GD			○		.375	.156	.0156	.1732	S	0°
		NF-DCMT32.51LD	NF-DCMT11T304N-LD			○		.375	.156	.0156	.1732	S	0°
		NF-DCMT32.52GD	NF-DCMT11T308N-GD			○		.375	.156	.0312	.1732	S	0°
		NF-DCMT32.52LD	NF-DCMT11T308N-LD			○		.375	.156	.0312	.1732	S	0°



DC

55° Diamond Type

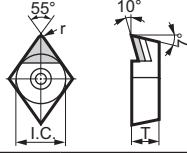
7° Relief

EDGE PREPARATIONS:

S Standard
 H Honed
 K Reinforced
 AW Chipbreaker Stud
 WF High Luster "Mirror-Like"
 Finish

● USA Stocked Item
 ★ Worldwide Warehouse Item
 ▲ USA Limited Availability Item
 ○ Available 1st Quarter 2015

DCMX



Stock

Dimensions

N

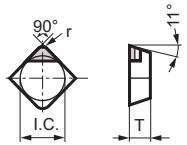
	Catalog No.	ISO Cat. No.	Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip	DCMX21.50	DCMT070201				●	.250	.094	.0039	.110	S	10°
	DCMX21.50.5	DCMT070202				●	.250	.094	.0078	.110	S	10°
	DCMX21.51	DCMT070204				●	.250	.094	.0156	.110	S	10°
	DCMX32.50	DCMT11T301				●	.375	.156	.0039	.1732	S	10°
	DCMX32.50.5	DCMT11T302				●	.375	.156	.0078	.1732	S	10°
	DCMX32.51	DCMT11T304				●	.375	.156	.0156	.1732	S	10°
NF Tip	NF-DCMX21.50	NF-DCMT070201				●	.250	.094	.0039	.110	S	10°
	NF-DCMX21.50.5	NF-DCMT070202				●	.250	.094	.0078	.110	S	10°
	NF-DCMX21.51	NF-DCMT070204				●	.250	.094	.0156	.110	S	10°
	NF-DCMX32.50	NF-DCMT11T301				●	.375	.156	.0039	.1732	S	10°
	NF-DCMX32.50.5	NF-DCMT11T302				●	.375	.156	.0078	.1732	S	10°
	NF-DCMX32.51	NF-DCMT11T304				●	.375	.156	.0156	.1732	S	10°
	NF-DCMX32.52	NF-DCMT11T308				●	.375	.156	.0313	.1732	S	10°

SP

Square Type

11° Relief

SPG



Stock

Dimensions

N

	Catalog No.	ISO Cat. No.	Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip	SPG321	SPGN090304		▲			.375	.125	.0156	-	S	0°
	SPG322	SPGN090308		●			.375	.125	.0313	-	S	0°
	SPG421	SPGN120304		●		●	.500	.125	.0156	-	S	0°
	SPG422	SPGN120308		●		●	.500	.125	.0313	-	S	0°
NF Tip	NF-SPG321	NF-SPGN090304			★	●	.375	.125	.0156	-	S	0°
	NF-SPG322	NF-SPGN090308			★	★	.375	.125	.0313	-	S	0°
	NF-SPG421	NF-SPGN120304			★	●	.500	.125	.0156	-	S	0°
	NF-SPG422	NF-SPGN120308			★	●	.500	.125	.0313	-	S	0°



Polycrystalline Diamond (PCD) Inserts

See page 564 for running parameters.

PCD

INSERTS - POSITIVE

TBGE • TCMX • TEGN

PCBN & PCD
Inserts

TB

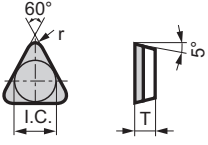

60° Triangle Type

5° Relief

EDGE PREPARATIONS:

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

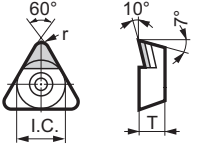
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

	TBGE			Stock				Dimensions					
				DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Full Top		Catalog No.	ISO Cat. No.										
		TBGE520.5B	TBGE060102BSN	●	●		.156	.125	.0078	-	S	0°	
		TBGE521B	TBGE060104BSN	●	●		.156	.125	.0156	-	S	0°	
NF Tip		TBGE522B	TBGE060108BSN		●		.156	.125	.0313	-	S	0°	
		NF-TBGE520.5	NF-TBGN060102		●	●	.156	.0625	.0078	-	S	0°	
		NF-TBGE521	NF-TBGN060104		★	★	.156	.0625	.0156	-	S	0°	

TC

60° Triangle Type

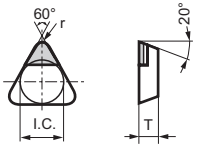
7° Relief

	TCMX			Stock				Dimensions					
				DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip		Catalog No.	ISO Cat. No.										
		TCMX1.81.50	TCMT090201			▲	.219	.094	.0039	.110	S	10°	
		TCMX1.81.50.5	TCMT090202			●	.219	.094	.0078	.110	S	10°	
		TCMX1.81.51	TCMT090204			●	.219	.094	.0156	.110	S	10°	
		TCMX21.50	TCMT110201			●	.250	.094	.0039	.110	S	10°	
		TCMX21.50.5	TCMT110202			▲	.250	.094	.0078	.110	S	10°	
		TCMX21.51	TCMT110204			●	.250	.094	.0156	.110	S	10°	
NF Tip		NF-TCMX1.81.50.5	NF-TCMT090202		●	▲	.219	.094	.0078	.098	S	10°	
		NF-TCMX1.81.51	NF-TCMT090204		●	●	.219	.094	.0156	.098	S	10°	
		NF-TCMX21.50	NF-TCMT110201		●	▲	.250	.094	.0039	.110	S	10°	
		NF-TCMX21.50.5	NF-TCMT110202		●	●	.250	.094	.0078	.110	S	10°	
	NF-TCMX21.51	NF-TCMT110204		●	●	.250	.094	.0156	.110	S	10°		

TE

60° Triangle Type

20° Relief

	TEGN			Stock				Dimensions					
				DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip		Catalog No.	ISO Cat. No.										
		TEGN321	TEGN160304			★	.375	.125	.0156	-	S	0°	



TP

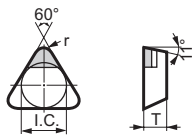
60° Triangle Type

11° Relief

EDGE PREPARATIONS:

S Standard
 H Honed
 K Reinforced
 AW Chipbreaker Stud
 WF High Luster "Mirror-Like"
 Finish

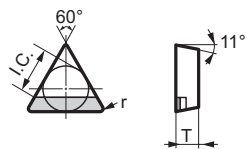
● USA Stocked Item
 ★ Worldwide Warehouse Item
 ▲ USA Limited Availability Item
 ○ Available 1st Quarter 2015

TPG

Catalog No.

ISO Cat. No.

	Stock				Dimensions					
	N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
	DA90	DA150	DA1000	DA2200						
Standard Tip	TPG221	TPGN110304	●	●	.250	.125	.0156	-	S	0°
	TPG222	TPGN110308	●	●	.250	.125	.0313	-	S	0°
	TPG321	TPGN160304	●	●	.375	.125	.0156	-	S	0°
	TPG322	TPGN160308	●	●	.375	.125	.0313	-	S	0°
	TPG323	TPGN160312	●	●	.375	.125	.0469	-	S	0°
	TPG431	TPGN220404	●	●	.500	.1875	.0156	-	S	0°
	TPG432	TPGN220408	●	●	.500	.1875	.0313	-	S	0°
NF Tip	NF-TPG1.81.51	NF-TPGN090204	●	●	.219	.094	.0156	-	S	0°
	NF-TPG220.5	NF-TPGN110302	●	●	.250	.125	.0078	-	S	0°
	NF-TPG221	NF-TPGN110304	●	●	.250	.125	.0156	-	S	0°
	NF-TPG222	NF-TPGN110308	●	●	.250	.125	.0313	-	S	0°
	NF-TPG320.5	NF-TPGN160302	●	●	.375	.125	.0078	-	S	0°
	NF-TPG321	NF-TPGN160304	●	●	.375	.125	.0156	-	S	0°
NF-TPG322	NF-TPGN160308	●	●	.375	.125	.0313	-	S	0°	

TPG-P

Catalog No.

ISO Cat. No.

	Stock				Dimensions					
	N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
	DA90	DA150	DA1000	DA2200						
NF Tip	NF-TPG221P	NF-TPGN110304P	★	★	.250	.125	.0156	-	S	0°
	NF-TPG222P	NF-TPGN110308P	★	★	.250	.125	.0313	-	S	0°
	NF-TPG321P	NF-TPGN160304P	★	★	.375	.125	.0156	-	S	0°



Polycrystalline Diamond (PCD) Inserts

See page 564 for running parameters.

PCD

INSERTS - POSITIVE

TPGA • TPGD

TP

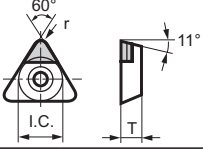
60° Triangle Type

11° Relief

EDGE PREPARATIONS:

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

	TPGA TPGD		Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
Standard Tip	TPGA220	TPGW110301				●	.250	.125	.0039	.130	S	0°
	TPGA220.5	TPGW110302		▲		●	.250	.125	.0078	.130	S	0°
	TPGA221	TPGW110304		●		●	.250	.125	.0156	.130	S	0°
	TPGA222	TPGW110308		▲		●	.250	.125	.0313	.130	S	0°
	TPGA331	TPGW160404		●		●	.375	.1875	.0156	.1693	S	0°
	TPGA332	TPGW160408		●		●	.375	.1875	.0313	.1693	S	0°
	TPGA333	TPGW160412		●		●	.375	.1875	.0469	.1693	S	0°
	NF-TPGD630	NF-TPGW080201			★	★	.1875	.094	.0039	.090	S	0°
	NF-TPGD630.5	NF-TPGW080202		●	●	●	.1875	.094	.0078	.090	S	0°
	NF-TPGD631	NF-TPGW080204		●	●	●	.1875	.094	.0156	.090	S	0°
NF Tip	NF-TPGA1.81.50.5	NF-TPGW090202		●	●	●	.219	.094	.0078	.102	S	0°
	NF-TPGA1.81.51	NF-TPGW090204		●	●	●	.219	.094	.0156	.102	S	0°
	NF-TPGA21.50	NF-TPGW110201		●	●	●	.250	.094	.0039	.107	S	0°
	NF-TPGA21.50.5	NF-TPGW110202		●	●	●	.250	.094	.0078	.107	S	0°
	NF-TPGA21.51	NF-TPGW110204		●	●	●	.250	.094	.0156	.107	S	0°
	NF-TPGA220.5	NF-TPGW110302		●	●	●	.250	.125	.0078	.130	S	0°
	NF-TPGA221	NF-TPGW110304		●	●	●	.250	.125	.0156	.130	S	0°
	NF-TPGA222	NF-TPGW110308		●	●	●	.250	.125	.0313	.130	S	0°
	NF-TPGA320.5	NF-TPGW160302		●	●	●	.375	.125	.0078	.1693	S	0°
	NF-TPGA321	NF-TPGW160304		●	●	●	.375	.125	.0156	.1693	S	0°
	NF-TPGA322	NF-TPGW160308		●	●	●	.375	.125	.0313	.1693	S	0°
	NF-TPGA330	NF-TPGW160401		●	★	●	.375	.1875	.0039	.1693	S	0°
	NF-TPGA330.5	NF-TPGW160402		●	●	●	.375	.1875	.0078	.1693	S	0°
	NF-TPGA331	NF-TPGW160404		●	●	●	.375	.1875	.0156	.1693	S	0°
	NF-TPGA332	NF-TPGW160408		●	●	●	.375	.1875	.0313	.1693	S	0°
	NF-TPGA631	NF-TPGW080204					.1875	.094	.0156	.090	S	0°

PCBN & PCD Inserts



TP

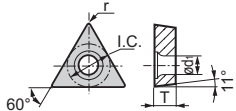
60° Triangle Type

11° Relief

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

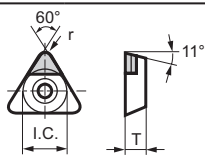
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

TPMT



Catalog No.	ISO Cat. No.	Stock					Dimensions					
		DA90	DA150	DA200	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
NF-TPMT630.5GD	NF-TPMT080202N-GD				○		.1875	.094	.0078	.090	S	0°
NF-TPMT630.5LD	NF-TPMT080202N-LD				○		.1875	.094	.0078	.090	S	0°
NF-TPMT631GD	NF-TPMT080204N-GD				○		.1875	.094	.0156	.090	S	0°
NF-TPMT631LD	NF-TPMT080204N-LD				○		.1875	.094	.0156	.090	S	0°
NF-TPMT1.81.50.5GD	NF-TPMT090202N-GD				○		.219	.094	.0078	.102	S	0°
NF-TPMT1.81.50.5LD	NF-TPMT090202N-LD				○		.219	.094	.0078	.102	S	0°
NF-TPMT1.81.51GD	NF-TPMT090204N-GD				○		.219	.094	.0156	.102	S	0°
NF-TPMT1.81.51LD	NF-TPMT090204N-LD				○		.219	.094	.0156	.102	S	0°
NF-TPMT21.50.5GD	NF-TPMT110202N-GD				○		.250	.094	.0078	.107	S	0°
NF-TPMT21.50.5LD	NF-TPMT110202N-LD				○		.250	.094	.0078	.107	S	0°
NF-TPMT21.51GD	NF-TPMT110204N-GD				○		.250	.094	.0156	.107	S	0°
NF-TPMT21.51LD	NF-TPMT110204N-LD				○		.250	.094	.0156	.107	S	0°
NF-TPMT220.5GD	NF-TPMT110302N-GD				○		.250	.125	.0078	.130	S	0°
NF-TPMT220.5LD	NF-TPMT110302N-LD				○		.250	.125	.0078	.130	S	0°
NF-TPMT221GD	NF-TPMT110304N-GD				○		.250	.125	.0156	.130	S	0°
NF-TPMT221LD	NF-TPMT110304N-LD				○		.250	.125	.0156	.130	S	0°
NF-TPMT222GD	NF-TPMT110308N-GD				○		.250	.125	.0312	.130	S	0°
NF-TPMT222LD	NF-TPMT110308N-LD				○		.250	.125	.0312	.130	S	0°
NF-TPMT330.5GD	NF-TPMT160402N-GD				○		.375	.1875	.0078	.1693	S	0°
NF-TPMT330.5LD	NF-TPMT160402N-LD				○		.375	.1875	.0078	.1693	S	0°
NF-TPMT331GD	NF-TPMT160404N-GD				○		.375	.1875	.0156	.1693	S	0°
NF-TPMT331LD	NF-TPMT160404N-LD				○		.375	.1875	.0156	.1693	S	0°
NF-TPMT332GD	NF-TPMT160408N-GD				○		.375	.1875	.0312	.1693	S	0°
NF-TPMT332LD	NF-TPMT160408N-LD				○		.375	.1875	.0312	.1693	S	0°

TPMX



Catalog No.	ISO Cat. No.	Stock				Dimensions					
		DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
TPMX22V	TPMT110300			●		.250	.125	.0020	.130	S	0°
TPMX220.5	TPMT110302			●		.250	.125	.0078	.130	S	0°
TPMX221	TPMT110304			●		.250	.125	.0156	.130	S	0°
TPMX222	TPMT110308			●		.250	.125	.0313	.130	S	0°
NF-TPMX220	NF-TPMT110301			●	●	.250	.125	.0039	.130	S	0°
NF-TPMX220.5	NF-TPMT110302			●	●	.250	.125	.0078	.130	S	0°
NF-TPMX221	NF-TPMT110304			●	●	.250	.125	.0156	.130	S	0°
NF-TPMX222	NF-TPMT110308			●	●	.250	.125	.0313	.130	S	0°



Polycrystalline Diamond (PCD) Inserts

See page 564 for running parameters.

PCD

INSERTS - POSITIVE

VCMA • VCMT • VCMX

VC

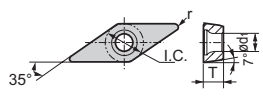
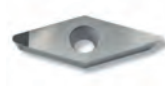
35° Diamond Type

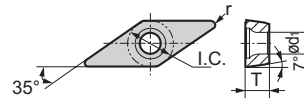
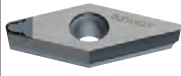
7° Relief

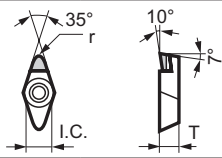
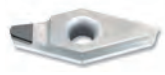
EDGE PREPARATIONS:

- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

<h1>VCMA</h1>				Stock				Dimensions				
				N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation
Standard Tip	Catalog No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Inscribed Circle					
	VCMA333	VCMW160412	●		●	●	.375	.1875	.0469	.1732	S	0°
	VCMA333WF	VCMW160412WF	●		●	●	.375	.1875	.0469	.1732	WF	0°
	VCMA220520	VCMW220520			●	●	.500	.219	.3125	.1732	S	0°
	NF-VCMA332	NF-VCMW160408			●	●	.375	.1875	.0313	.1732	S	0°
	NF-VCMA333	NF-VCMW160412			●	●	.375	.1875	.0469	.1732	S	0°
	NF-VCMA333H	NF-VCMW160412H			●	●	.375	.1875	.0469	.1732	H	0°

<h1>VCMT</h1>				Stock					Dimensions				
				N					Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation
Standard Tip	Catalog No.	ISO Cat. No.	DA90	DA150	DA200	DA1000	DA2200	Inscribed Circle					
	NF-VCMT220.5GD	NF-VCMT110302N-GD				○		.250	.125	.0078	.130	S	0°
	NF-VCMT220.5LD	NF-VCMT110302N-LD				○		.250	.125	.0078	.130	S	0°
	NF-VCMT221GD	NF-VCMT110304N-GD				○		.250	.125	.0156	.130	S	0°
	NF-VCMT221LD	NF-VCMT110304N-LD				○		.250	.125	.0156	.130	S	0°
	NF-VCMT331GD	NF-VCMT160404N-GD				○		.375	.1875	.0156	.1693	S	0°
	NF-VCMT331LD	NF-VCMT160404N-LD				○		.375	.1875	.0156	.1693	S	0°
	NF-VCMT332GD	NF-VCMT160408N-GD				○		.375	.1875	.0312	.1693	S	0°
	NF-VCMT332LD	NF-VCMT160408N-LD				○		.375	.1875	.0312	.1693	S	0°
	NF-VCMT333GD	NF-VCMT160412N-GD				○		.375	.1875	.0469	.1693	S	0°
	NF-VCMT333LD	NF-VCMT160412N-LD				○		.375	.1875	.0469	.1693	S	0°

<h1>VCMX</h1>				Stock				Dimensions				
				N				Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation
Standard Tip	Catalog No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Inscribed Circle					
	VCMX333	VCMT160412			●	●	.375	.1875	.0469	.1732	S	10°
	VCMX333WF	VCMT160412WF			●	●	.375	.1875	.0469	.1732	WF	10°
	NF-VCMX220	NF-VCMT110301			●	●	.250	.125	.0039	.134	S	10°
	NF-VCMX220.5	NF-VCMT110302			●	●	.250	.125	.0078	.134	S	10°
	NF-VCMX221	NF-VCMT110304			●	●	.250	.125	.0156	.134	S	10°
	NF-VCMX331	NF-VCMT160404			●	●	.375	.1875	.0156	.1732	S	10°
	NF-VCMX332	NF-VCMT160408			●	●	.375	.1875	.0313	.1732	S	10°
	NF-VCMX333	NF-VCMT160412			●	●	.375	.1875	.0469	.1732	S	10°



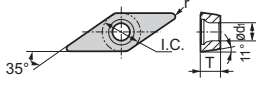
VP

35° Diamond Type

11° Relief

EDGE PREPARATIONS:

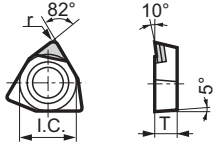
- S Standard
- H Honed
- K Reinforced
- AW Chipbreaker Stud
- WF High Luster "Mirror-Like" Finish
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- Available 1st Quarter 2015

	VPMA		Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
	Catalog No.	ISO Cat. No.										
Standard Tip	VPMA443	VPMW220612	●				.500	.250	.0469	.214	S	0°
	VPMA443WF	VPMW220612WF	●				.500	.250	.0469	.214	WF	0°

WB

80° Trigon Type

5° Relief

	WBMX		Stock				Dimensions					
			DA90	DA150	DA1000	DA2200	Inscribed Circle	Thickness	Nose Radius	Hole Diameter	Edge Preparation	Rake Angle
	Catalog No.	ISO Cat. No.										
Standard Tip	WBMX520L	WBMT060101L	●				.156	.0625	.0039	.090	S	10°
	WBMX520.5L	WBMT060102L	●				.156	.0625	.0078	.090	S	10°
	WBMX521L	WBMT060104L	●				.156	.0625	.0156	.090	S	10°



TOOLHOLDERS

Pages 179-206



Toolholders

TOOLHOLDERS	PAGES
Nomenclature.....	180-181
Insert Holding Method Overview.....	182
SumiTurn Capto & T-REX Holder Systems.....	183-184
DType Toolholders.....	185-186
ANSI Standard Combination Toolholders.....	187-197
Swiss Toolholders.....	198-206

Small Product Machining Tool Selection

Turning (1)

Usage/Type/Page	Operation	Tool Type	Code
Cutting Edge Style	Cut-Off	SCT Type	F40
	Back Turning	SBT Type PBT Type	D11
	Copying	SV Type	D31
	General Turning	P Type/S Type	D19
	Grooving	GWC Type	F4
	Grooving & Cut-Off	GND Type	F10

Max. dia. $\phi 5$ to 16mm

SVLC Type, SVPC Type, 7°Pos., 11°Pos., P.D./C Type, S.D./C Type, Back clamp, Screw lock

Turning (2)

Usage/Type/Page	Operation	Tool Type	Code
Cutting Edge Style	Turning	SFT Type	D12
	Turning	PTXN-X Type	D18
	Grooving Traverse Cutting	SGE Type	F24
	Threading	STH Type	F60
	Threading	SSTE Type	F52
	Threading	THE Type	F64

Negative

Turning (3)

External turning made possible with holder sleeves.

Usage/Type/Page

Round Shank Holder

RS Type

D13

Multi-functional Tool

A single holder capable of performing two operations.

Usage/Type/Page

Twin Head Holder

ID + OD
CKBE Type

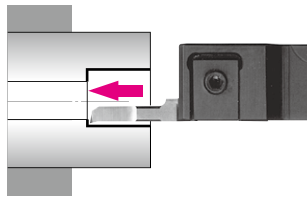
ID + ID
CKBB Type

E10

E11

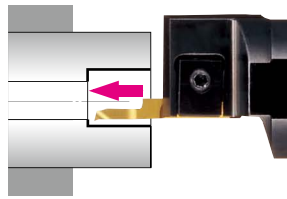
Small Product Machining Tool Selection

Boring (1) Machining of very small diameter 1 mm or above



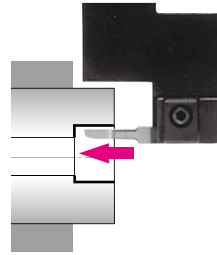
Very Small Dia. Boring
CKB Type

E14



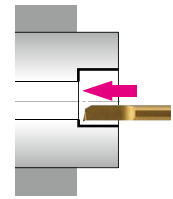
Very Small Dia. Boring (Round Shank)
S-CKB Type / S-CKB-S Type

E14



Gang-type Tool Post
Very Small Dia. Boring
CKBS Type

E13

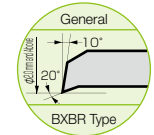
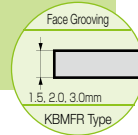
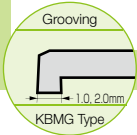
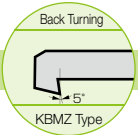
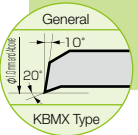


Solid Carbide Bar
BXBR Type

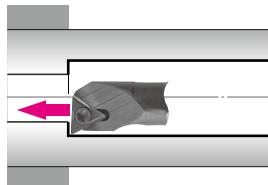
E16

Usage/Type/Page

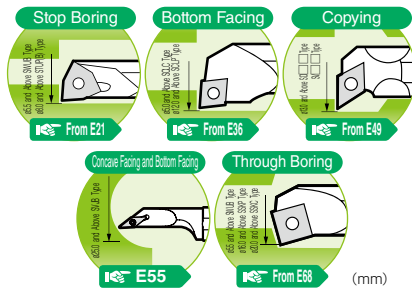
Cutting Edge Style



Boring (2) Machining of small diameter 5mm or above



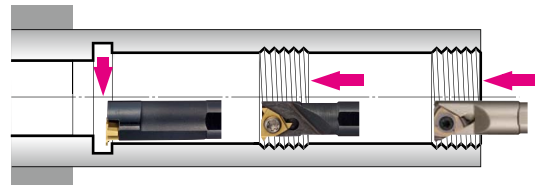
Boring
SW/ST/SC/SD/SV/SS Type
E21 to E72



Usage/Type/Page

Cutting Edge Style

Grooving and Threading

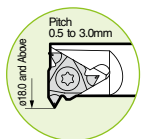
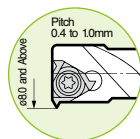
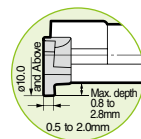


Internal Grooving
SGIT Type
E25

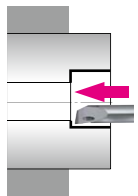
Internal Threading
STHI Type
F66

Internal Threading
SSTI Type
F52

Cutting Edge Style

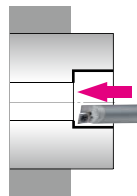


SUMIBORON (CBN) Small Hole Boring Bars CBN



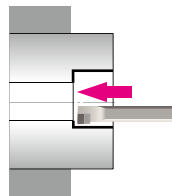
Small Hole Boring Bars
BSME Type *New*

E18



Small Hole Boring Bars
SEXC Type *New*

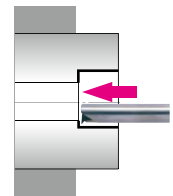
E19



Small Hole Boring Bars
BNBX Type

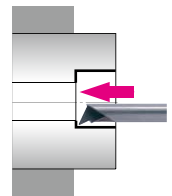
E20

SUMIDIA (PCD) Small Hole Boring Bars PCD



Small Hole Boring Bars
DABB-C Type

E17

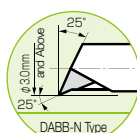
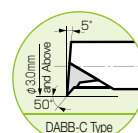
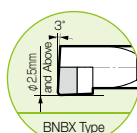
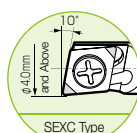
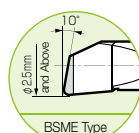


Small Hole Boring Bars
DABB-N Type

E17

Usage/Type/Page

Cutting Edge Style

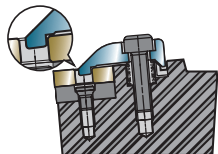


M

Insert Holding

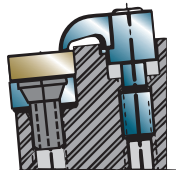
D

Clamp Mechanism



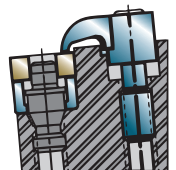
C

Clamp



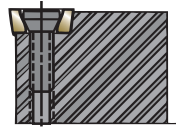
M

Clamp and Lock Pin



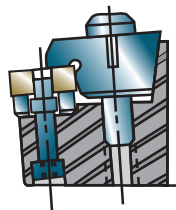
S

Screw Only



W

Wedge Clamp*



W

Insert Shape

C

Diamond



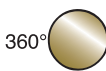
D

Diamond



R

Round



S

Square



T

Triangle



V

Diamond



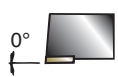
W

Trigon



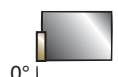
L

Toolholder Style



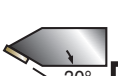
A

0° side cutting straight shank



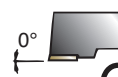
C

0° end cutting straight shank



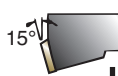
D

30° side cutting straight shank



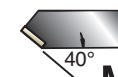
G

0° side cutting offset shank



K

15° end cutting offset shank



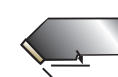
M

40° side cutting straight shank



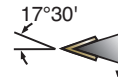
Q

17°30' end cutting straight shank



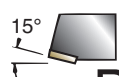
S

45° side cutting offset shank



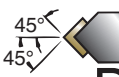
V

17°30' side cutting straight shank



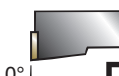
B

15° side cutting straight shank



D

45° side cutting straight shank



F

0° end cutting offset shank



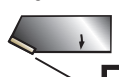
J

-3° side cutting offset shank



L

5° side & end cutting offset shank



P

27°30' side cutting straight shank



R

15° side cutting offset shank



U

-3° end cutting offset shank

All lead angles are ±1°

N

Insert Relief Angle

B



C



N



P



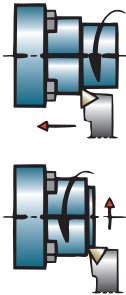
*Sumitomo Standard Only



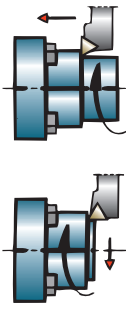
R

Hand

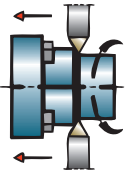
R
Right Hand



L
Left Hand

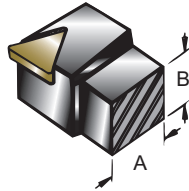


N
Neutral Hand



16

Shank Size



Square Shanks

This indicates the A & B dimensions in sixteenths (1/16).

examples:
 $12 = 12/16 = 3/4$ sq.
 $16 = 16/16 = 1.0$ sq.
 $20 = 20/16 = 1-1/4$ sq.

Rectangle Shanks

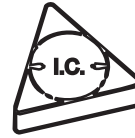
The first digit indicates the "A" dimension in eighths (1/8).

The second digit indicates the "B" dimension in quarters (1/4).

examples:
 $86 = A \times B$
 $1.0 \times 1-1/2$
 $85 = A \times B$
 $1.0 \times 1-1/4$

4

Insert Size



For equal sided inserts this indicates the inscribed circle (I.C.) in eighths (1/8)

examples,

$6 = 6/8 = 3/4$ " I.C.

$4 = 4/8 = 1/2$ " I.C.

$2.5 = 2.5/8 = 5/16$ I.C.

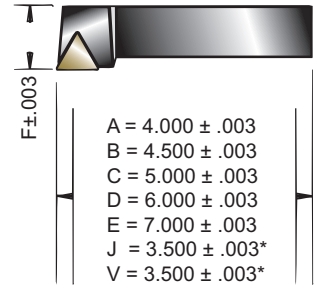
For rectangles and parallelograms two digits are necessary.

1st digit = number of eighths (1/8) in width.

2nd digit = number of quarters (1/4) in length.

D

Qualifications



*Sumitomo standard only

Master Gage Insert Nose Radius Chart for Qualified Holders

Insert I.C.	Nose Radius
1/4, 5/16	.015
3/8, 1/2	.031
5/8, 3/4	.047
1.0	.062



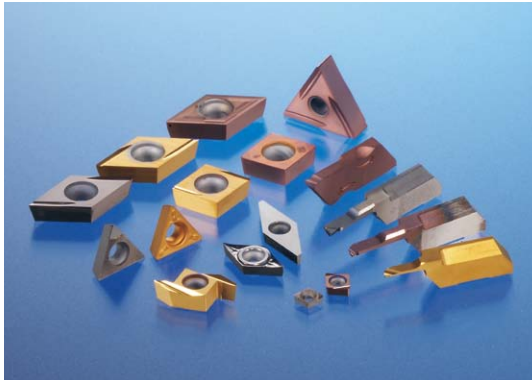


■ General Features

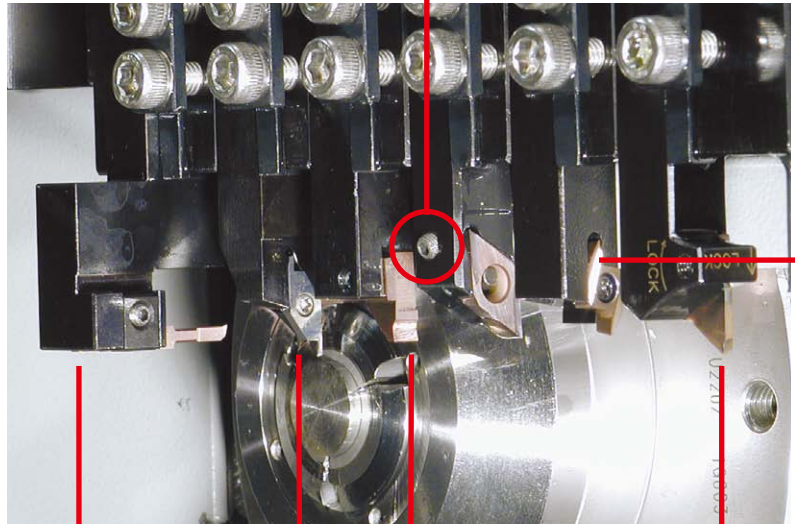
In 1984, Sumitomo Electric Hardmetal first released the SECMINI Tool Holder series for the machining of small components in small NC autolathes. Through these years of experience, new tool designs which include the side lever lock tool holder were developed to meet the various machining requirements such as Back Turning, Copying, Cut-off, etc; and Sumitomo is continually striving to enhance the series.

D
 Small Product
 Machining

■ Full lineup of grades from Carbide to PCD



From D6



■ Special tools for autolathe machines to meet various types of machining

● Very Small Dia. Boring Tool Holder CKB Type
 Min. dia. $\phi 1$ to $\phi 5$ mm



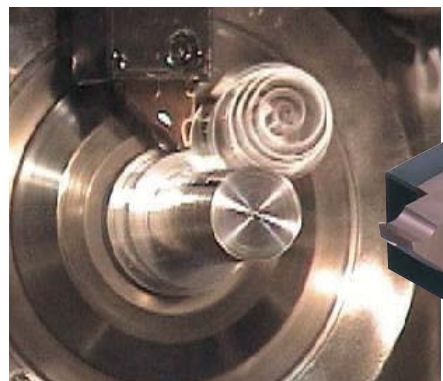
From E12

● Very Small Product Turning Tool SPB Type
 Best suited for products with a diameter of less than $\phi 10$ mm



From D8

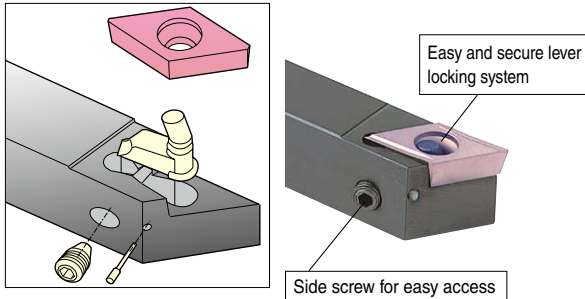
● Plunge-cut Tool SGW Type
 Plunge cutting reduces machining time and eliminates chip control problems



D10

■ A wide selection of easy-to-use holders

● Side Lever Locking (Back Clamp) Tool Holders PD/PC Type



👉 D19,D23

● Back-Turning Tool Holder SBT/PBT Type

Sharp cutting edges with good surface finish
Max. reach of insert 8.0 mm, edge width 2.5 mm



👉 D11

● Cut-off Tool Holder SCT Type

Easy insert change by just loosening the screw from the back
Max. cut-off dia. ϕ 5 mm, ϕ 12 mm, ϕ 16 mm



👉 F40

● Zero Off-set Holders *Cat. No. Suffixes: - X Tool compensation not required for small gang-type lathes



👉 From D16

● Twin Head Holders

Multi-functional tools for autolathes
One holder with 2 operations



👉 From E10

● Round Shank Holder RS Type

External turning made possible with holder sleeves



👉 From D13

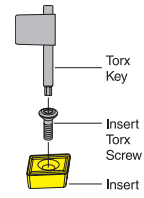
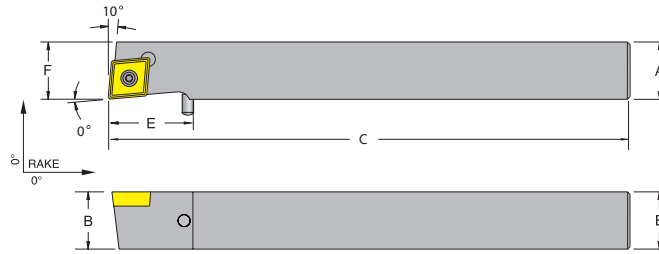
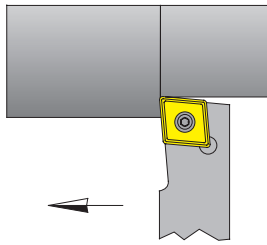
● SEC-Grooving Tools GND Type

Full range of shanks for small product machining
Can be used for grooving diameters of 1.25 mm and above



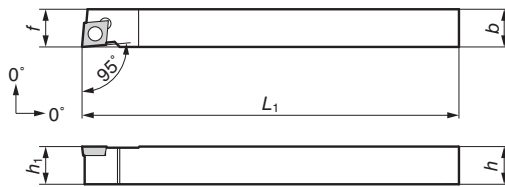
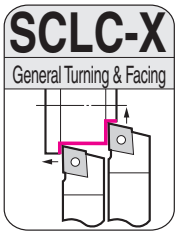
👉 From F10

SCAC Series



Right Hand Shown, Left Hand Opposite

Catalog Number		A	B	C	E (Tool Stop)	F	Gage Insert	Insert Torx Screw	Torx Key
Right Hand	Left Hand								
SCACR062B	SCACL062B	0.375	0.375	4.500	1.000	0.375	CC_-21.51	TS25.45-6M2	TRX08
SCACR062D	SCACL062D	0.375	0.375	6.000	1.000	0.375			
SCACR083B	SCACL083B	0.500	0.500	4.500	1.000	0.500	CC_-32.52	TS4.7-10M1	TRX15
SCACR083D	SCACL083D	0.500	0.500	6.000	1.000	0.500			
SCACR103B	SCACL103B	0.625	0.625	4.500	1.000	0.625			
SCACR103D	SCACL103D	0.625	0.625	6.000	1.000	0.625			



■ Parts



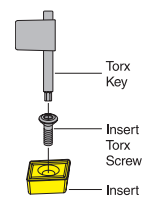
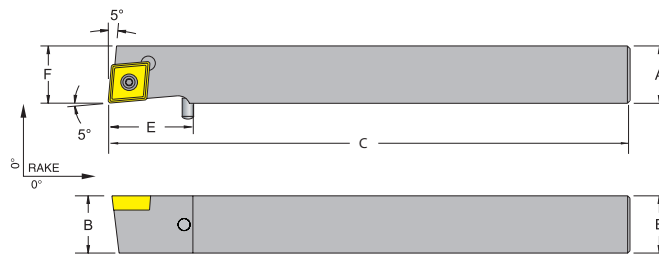
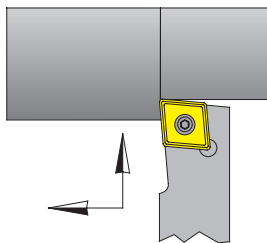
■ Holder

Above figures show right hand tools.

Catalog Number	Stock		Dimensions (mm)						Applicable Insert	Screw	Wrench
	R	L	h	b	L1	f	h1				
SCLCR/L1010-H06X	★	★	10	10	100	10	10	CC_T21.5	BFTX02506N	TRX08	
SCLCR/L1215-K09X	★	★	12	15	125	15	12	CC_T32.5	BFTX0409N	TRX15	
SCLCR/L1215-F09X	★	★	12	15	85	15	12	CC_T32.5			

85mm Shank

SCNC Series



Right Hand Shown, Left Hand Opposite

Catalog Number		A	B	C	E (Tool Stop)	F	Gage Insert	Insert Torx Screw	Torx Key
Right Hand	Left Hand								
SCNCR062B	SCNCL062B	0.375	0.375	4.500	1.000	0.375	CC_21.51	TS25.456M2	TRX08
SCNCR062D	SCNCL062D	0.375	0.375	6.000	1.000	0.375			
SCNCR082B	SCNCL082B	0.500	0.500	4.500	1.000	0.500	CC_32.52	TS4.710M1	TRX15
SCNCR083B	SCNCL083B	0.500	0.500	4.500	1.000	0.500			
SCNCR083D	SCNCL083D	0.500	0.500	6.000	1.000	0.500			
SCNCR103B	SCNCL103B	0.625	0.625	4.500	1.000	0.625			
SCNCR103D	SCNCL103D	0.625	0.625	4.500	1.000	0.625			



Swiss Toolholders

Zero Offset Toolholders, Screw Lock

Swiss
TOOLHOLDERS
Series: SDAC • SDJC • SDNC

Swiss
Toolholders

SDAC Series

Catalog Number		A	B	C	E (Tool Stop)	F	Gage Insert	Insert Torx Screw	Torx Key
Right Hand	Left Hand								
SDACR062B	SDACL062B	0.375	0.375	4.500	1.000	0.375	DC__21.51	TS25.456M2	TRX08
SDACR062D	SDACL062D	0.375	0.375	6.000	1.000	0.375			
SDACR082B	SDACL082B	0.500	0.500	4.500	1.000	0.500			
SDACR082D	SDACL082D	0.500	0.500	6.000	1.000	0.500	DC__32.52	TS4.710M1	TRX15
SDACR083B	SDACL083B	0.500	0.500	4.500	1.000	0.500			
SDACR083D	SDACL083D	0.500	0.500	6.000	1.000	0.500			
SDACR103B	SDACL103B	0.625	0.625	4.500	1.000	0.625	DC__32.52	BFTX02506N	TRX08
SDACR103D	SDACL103D	0.625	0.625	6.000	1.000	0.625			
SDACR123B	SDACL123B	0.750	0.750	4.500	1.000	0.750			
SDACR1010-H07X*	SDACL1010-H07X*	10	10	100	10	10	DC__21.51	BFTX02506N	TRX08
SDACR1215-K11X*	SDACL1215-K11X*	12	15	125	15	12	DC__32.52	BFTX0409N	TRX15
SDACR1215-F11X*	SDACL1215-F11X*	12	15	85	15	12	DC__32.52		

* = Worldwide Warehouse Stock

SDJC-X

General Turning & Copying

■ Holder

■ Parts

Above figures show right hand tools.

Catalog Number	Stock		Dimensions (mm)					Applicable Insert	Screw	Wrench
	R	L	h	b	L ₁	f	h ₁			
SDJC R/L1010-H07X	★	★	10	10	100	10	10	DC_T21.5	BFTX02506N	TRX08
SDJC R/L1215-K11X	★	★	12	15	125	15	12	DC_T32.5	BFTX0409N	TRX15
SDJC R/L1215-F11X	★	★	12	15	85	15	12	DC_T32.5		

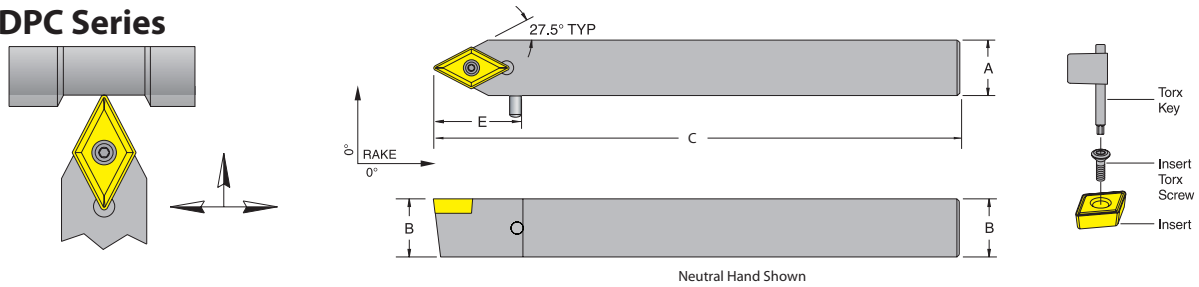
85mm Shank

SDNC Series

Catalog Number		A	B	C	E (Tool Stop)	F	Gage Insert	Insert Torx Screw	Torx Key
Right Hand	Left Hand								
SDNCR062B	SDNCL062B	0.375	0.375	4.500	1.000	0.375	DC__21.51	TS25.456M2	TRX08
SDNCR082B	SDNCL082B	0.500	0.500	4.500	1.000	0.500			
SDNCR103B	SDNCL103B	0.625	0.625	4.500	1.000	0.625	DC__32.52	TS4.710M1	TRX15

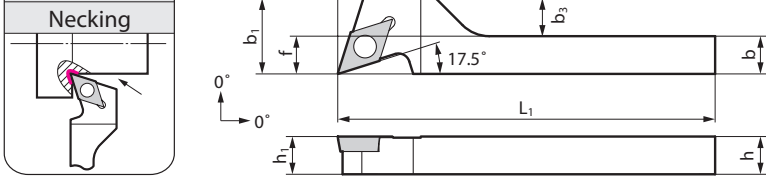


SDPC Series



Catalog Number	A	B	C	E (Tool Stop)	Gage Insert	Insert Torx Screw	Torx Key
SDPCN062B	0.375	0.375	4.500	1.000	DC_21.51	TS25.456M2	TRX08
SDPCN062D	0.375	0.375	6.000	1.000			
SDPCN082B	0.500	0.500	4.500	1.000			
SDPCN083B	0.500	0.500	4.500	1.000	DC_32.52	TS4.710M1	TRX15
SDPCN083D	0.500	0.500	6.000	1.000			
SDPCN103B	0.625	0.625	4.500	1.000			
SDPCN103D	0.625	0.625	6.000	1.000			

SDPC-X



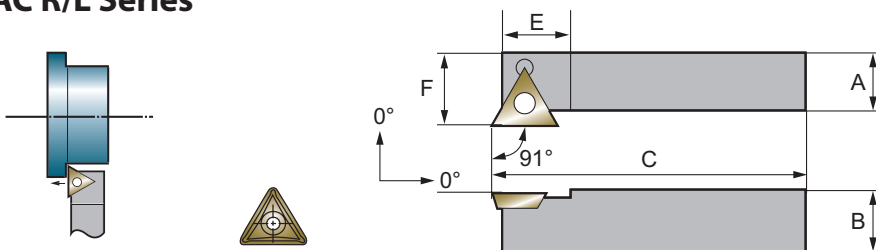
■ Holder

Catalog Number	Stock		Dimensions (mm)							Applicable Insert
	R	L	h	b	L ₁	f	h ₁	b ₁	b ₃	
SDPCR/L1010-H11X	★	★	10	10	100	10	10	20	10	DC_T32.5

■ Parts

Screw	Wrench
BFTX0409N	TRX15

STAC R/L Series



Catalog Number		7° Positive Gage Insert	Stock	A	B	C	E	F	Insert Screw	Torque Wrench
Right Hand	Left Hand									
STACR062B	STACL062B	TCMT21.51	•	.375	.375	4.500	0.625	0.375	ST-21.5	TRX08
STACR082B	STACL082B	TCMT21.51	•	.500	.500	4.500				
STACR103B	STACL103B	TCMT32.52	•	.625	.625	4.500	0.750	0.625	ST-32.5	TRX15
STACR062D	STACL062D	TCMT21.51	•	.375	.375	6.000	0.625	0.375	ST-21.5	TRX08
STACR082D	STACL082D	TCMT21.51	•	.500	.500	6.000				
STACR103D	STACL103D	TCMT32.52	•	.625	.625	6.000	0.750	0.625	ST-32.5	TRX15
STACR1010-11*	STACL1010-11*	TCMT21.51	★	10.0	10.0	100.0	16.0	12.0	ST-21.5	TRX08
STACR1212-11*	STACL1212-11*	TCMT21.51	★	12.0	12.0	100.0	16.0	16.0	ST-21.5	
STACR1616-16*	STACL1616-16*	TCMT32.52	★	16.0	16.0	100.0	16.0	20.0	ST-32.5	

* Not zero offset

• = USA stocked item

★ = Worldwide Warehouse item



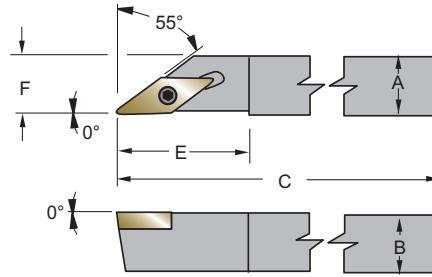
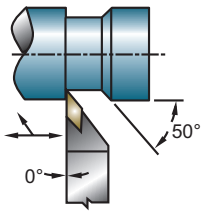
Swiss Toolholders

Zero Offset Toolholders, Screw Lock

Swiss
TOOLHOLDERS
Series: SVAB • SVNB • SVJC-X

Swiss
Toolholders

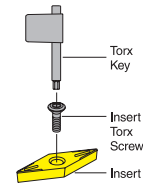
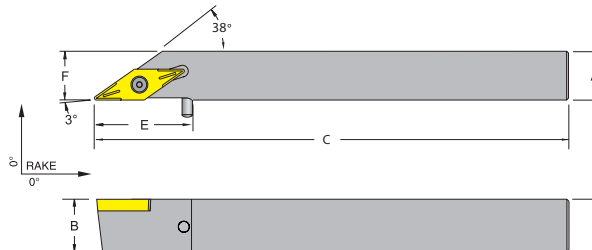
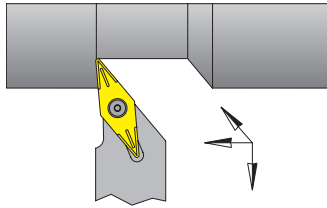
SVAB R/L Series



Catalog Number		5° Positive Gage Insert	Stock	A	B	C	E	F	Insert Screw	Torque Wrench
Right Hand	Left Hand									
SVABR103B	SVABL103B	VBMT332	•	.625	.625	4.500	1.375	0.625	ST-32.5	TRX15
SVABR062D	SVABL062D	VBMT221	•	.375	.375	6.000	0.875	0.375	ST-21.5	TRX08
SVABR082D	SVABL082D	VBMT221	•	.500	.500	6.000				
SVABR103D	SVABL103D	VBMT332	•	.625	.625	6.000	1.375	0.625	ST-32.5	TRX15
SVABR1010-11	SVABL1010-11	VBMT221		10.0	10.0	150.0	22.0	10.0	ST-21.5	TRX08
SVABR1212-11	SVABL1212-11	VBMT221		12.0	12.0	150.0				
SVABR1616-16	SVABL1616-16	VBMT332		16.0	16.0	150.0	35.0	16.0	ST-32.5	TRX15

• = USA stocked item

SVNB Series

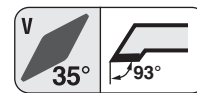
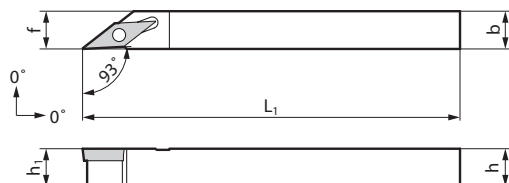
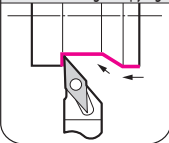


Right Hand Shown, Left Hand Opposite

Catalog Number		A	B	C	E (Tool Stop)	F	Gage Insert	Insert Torx Screw	Torx Key
Right Hand	Left Hand								
SVNBR062B	SVNBL062B	0.375	0.375	4.500	1.000	0.375	VB_21.51	TS25.456M2	TRX08
SVNBR062D	SVNBL062D	0.375	0.375	6.000	1.000	0.375			
SVNBR082B	SVNBL082B	0.500	0.500	4.500	1.000	0.500			
SVNBR082D	SVNBL082D	0.500	0.500	6.000	1.000	0.500			
SVNBR103B	SVNBL103B	0.625	0.625	4.500	1.000	0.625	VB_32.52	TS4.710M1	TRX15
SVNBR103D	SVNBL103D	0.625	0.625	6.000	1.000	0.625			

SVJC-X

General Turning & Copying



Parts

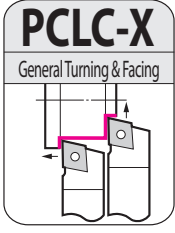
Screw	Wrench
BFTX02506N	TRX08

Holder

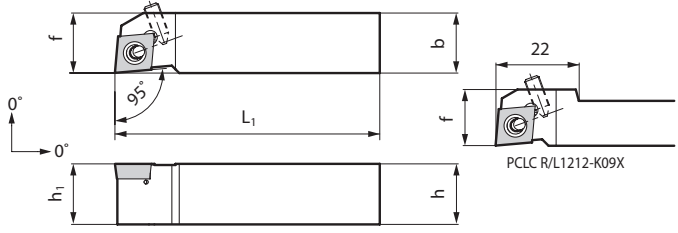
Catalog Number	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
SVJCR/L1010-H11X	★	★	10	10	100	10	10	VC_T22
SVJCR/L1212-K11X	★	★	12	12	125	12	12	VC_T22
SVJCR/L1212-F11X	★	★	12	12	85	12	12	VC_T22

★ = Worldwide Warehouse item



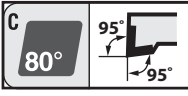


PCLC-X
General Turning & Facing



PCLC R/L1212-K09X

Side lever locking holders

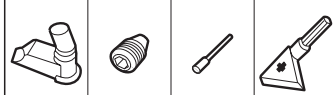


Above figures show right hand tools.

Holder

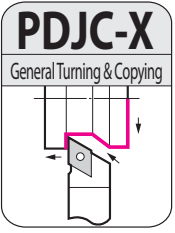
Catalog Number	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
PCLC R/L1010-K06X	★		10	10	125	10	10	CC_T21.5
PCLC R/L1212-K09X	★		12	12	125	15	12	CC_T32.5
PCLC R/L1616-K09X	★		16	16	125	16	16	CC_T32.5

Parts

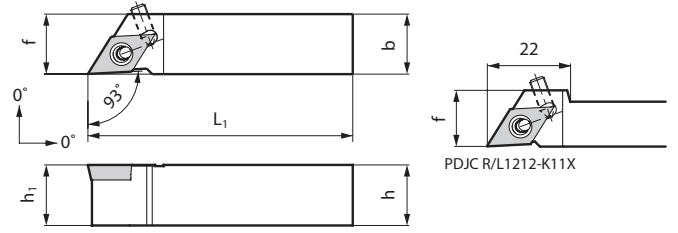


Lever Pin	Set Screw	Pin	Wrench
LCL06	BTT0407	LP07	TH020
LCL09	BTT0411	LP06	

★ = Worldwide Warehouse item

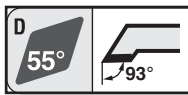


PDJC-X
General Turning & Copying



PDJC R/L1212-K11X

Side lever locking holders




Above figures show right hand tools.

Holder

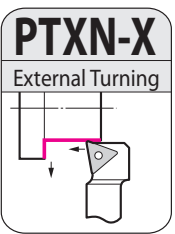
Catalog Number	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
PDJC R/L1010-K07X	★		10	10	125	10	10	DC_T21.5
PDJC R/L1212-K11X	★		12	12	125	15	12	DC_T32.5
PDJC R/L1616-K11X	★		16	16	125	16	16	DC_T32.5

Parts

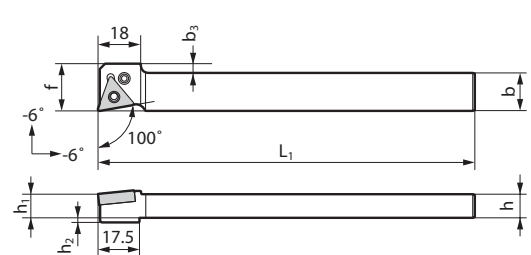


Lever Pin	Set Screw	Pin	Wrench
LCL06	BTT0407	LP04	TH020
LCL09	BTT0411	LP07	

★ = Worldwide Warehouse item



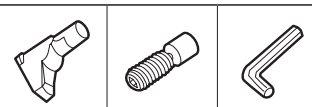
PTXN-X
External Turning



Holder

Catalog Number	Stock	Dimensions (mm)							Applicable Insert
		h	b	L ₁	f	h ₁	h ₂	b ₃	
PTXN R1016-X16X	★	10	16	120	20	10	2	4	TN□□33
PTXN R1216-X16X	★	12	16	120	20	12	0	4	TN□□33
PTXN R1616-X16X	★	16	16	120	20	16	0	4	TN□□33
PTXN R2020-X16X	★	20	20	120	20	20	0	0	TN□□33

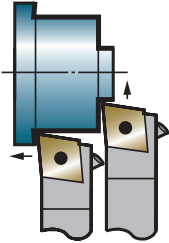
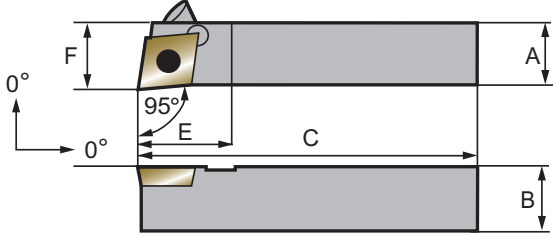





Parts



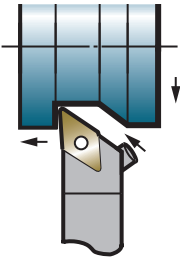
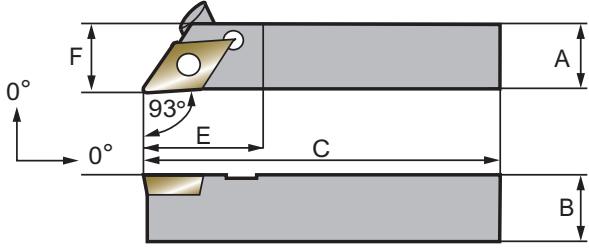





Lever Pin	Screw	Wrench
LCL33NT	LCS33NT	LH020NT

★ = Worldwide Warehouse item



PCLC R/LSeries			Side lever locking holders										
													
Sumitomo Cat. No.			Dimensions (inch/mm)										
Right Hand	Left Hand	7° Positive Gage Insert	Stock	A	B	C	E	F	Lever Pin	Clamp Bolt	Pin	Wrench	
PCLCR062D	PCLCL062D	CCMT21.51	●	.375	.375	6.000	.472	.395	LCL06	BTT0407	LP07	TH020	
PCLCR083D	PCLCL083D	CCMT32.52	●	.500	.500	6.000	.591	.520	LCL09	BTT0407	LP06	TH020	
PCLCR103D	PCLCL103D	CCMT32.52	●	.625	.625	6.000	.630	.645	LCL09	BTT0411	LP06	TH020	
<i>PCLCR1010-K06</i>	<i>PCLCL1010-K06</i>	CCMT21.51	★	10.0	10.0	125.0	12.0	10.5	LCL06	BTT0407	LP07	TH020	
<i>PCLCR1212-K09</i>	<i>PCLCL1212-K09</i>	CCMT32.52	★	12.0	12.0	150.0	16.0	12.5	LCL09	BTT0407	LP06	TH020	
<i>PCLCR1616-M09</i>	<i>PCLCL1616-M09</i>	CCMT32.52	★	16.0	16.0	150.0	16.0	16.5	LCL09	BTT0411	LP06	TH020	

● = USA stocked item ★ = Worldwide Warehouse item

PDJC R/LSeries			Side lever locking holders										
													
Sumitomo Cat. No.			Dimensions (Inch/mm)										
Right Hand	Left Hand	7° Positive Gage Insert	Stock	A	B	C	E	F	Lever Pin	Clamp Bolt	Pin	Wrench	
PDJCR062D	PDJCL062D	DCMT21.51	●	.375	.375	6.000	.472	.395	LCL06	BTT0407	LP04	TH020	
PDJCR083D	PDJCL083D	DCMT32.52	●	.500	.500	6.000	.787	.520	LCL09	BTT0407	LP07	TH020	
PDJCR103D	PDJCL103D	DCMT32.52	●	.625	.625	6.000	.787	.645	LCL09	BTT0411	LP07	TH020	
<i>PDJCR1010-K07</i>	<i>PDJCL1010-K07</i>	DCMT21.51	★	10.0	10.0	125.0	15.0	10.5	LCL06	BTT0407	LP04	TH020	
<i>PDJCR1212-M11</i>	<i>PDJCL1212-M11</i>	DCMT32.52	★	12.0	12.0	150.0	20.0	12.5	LCL09	BTT0407	LP07	TH020	
<i>PDJCR1616-M11</i>	<i>PDJCL1616-M11</i>	DCMT32.52	★	16.0	16.0	150.0	20.0	16.5	LCL09	BTT0411	LP07	TH020	

● = USA stocked item ★ = Worldwide Warehouse item



Swiss Tooling Inserts

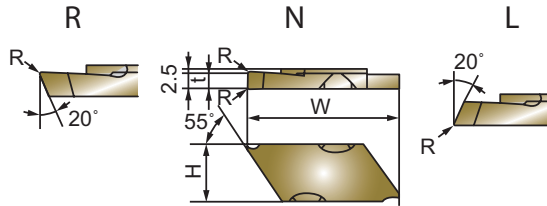
for precision turning applications:

- Cut-off
- Back Turn
- Boring/Roughing
- Boring/Finishing

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

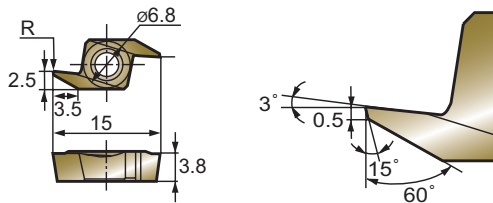
- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

CTL CTR for SCT Type Holder (p. 200)



Sumitomo Catalog #	ISO Catalog #	t	R	W	H	Coated			Cermet	Uncoated
						AC530U				
CTL121005R	CTL121005R	1.0				●				
CTL121005N	CTL121005N					★				
CTL121005L	CTL121005L					★				
CTL121505R	CTL121505R	1.0				●				
CTL121505N	CTL121505N					★				
CTL121505L	CTL121505L					★				
CTL122005R	CTL122005R	2.0	0.05	19.0	7.0	●				
CTL122005N	CTL122005N					★				
CTL122005L	CTL122005L					★				
CTR121005R	CTR121005R	1.0				●				
CTR121005N	CTR121005N					●				
CTR121005L	CTR121005L					●				
CTR121505R	CTR121505R	1.5				●				
CTR121505N	CTR121505N					●				
CTR121505L	CTR121505L					●				
CTR122005R	CTR122005R	2.0				●				
CTR122005N	CTR122005N					●				

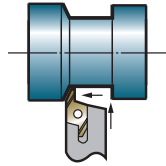
BTR for SBT Type Holder (p. 200)



Sumitomo Catalog #	ISO Catalog #	I.C.	T	r	Coated			Cermet		Uncoated	
					AC530U			T1500A	T1200A		
BTR3505	BTR3505	6.8	3.8	0.05	●			★	★		
BTR3515	BTR3515			0.15	★			★	★		
BTR5505	BTR5505			0.05	★						
BTR5515	BTR5515			0.15	★						
BTR8005	BTR8005			0.05	★						
BTR8015	BTR8015			0.15	★						

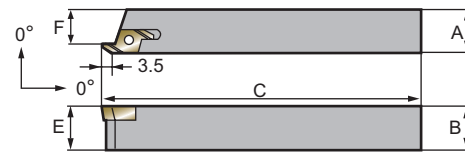


SBT R Series



Back Turning Holders

See page for inserts

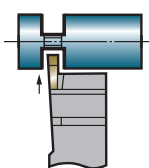


Sumitomo Cat. No.		Gage Insert	Dimensions (inch/mm)						Insert Screw	Torx Wrench
Right Hand	Left Hand		Stock	A	B	C	E	F		
SBTR3506		BTR35	●	0.375	0.375	6.000	0.375	7.5	BFTX0307N	TRX10
SBTR3508		BTR35	●	0.500	0.500	6.000	0.500	9.5	BFTX0307N	TRX10
SBTR3510		BTR35	●	0.625	0.625	6.000	0.625	13.5	BFTX0307N	TRX10
SBT35R1010		BTR35	★	10.0	10.0	150.0	10.0	7.5	BFTX0307N	TRX10
SBT35R1212		BTR35	★	12.0	12.0	150.0	12.0	9.5	BFTX0307N	TRX10
SBT35R1616		BTR35	★	16.0	16.0	150.0	16.0	13.5	BFTX0307N	TRX10

● = USA stocked item

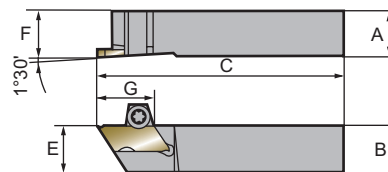
★ = Worldwide Warehouse item

SCT R/L Series



Cut-Off Holders

See page for inserts

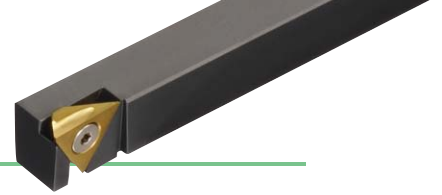


Sumitomo Cat. No.		Gage Insert	Dimensions (Inch/mm)							Insert Screw	Torx Wrench	
Right Hand	Left Hand		Stock	A	B	C	E	F	G			
SCTR08	SCTL08	CTR12	●	.500	.500	6.000	.500	.500	.591	BFTX0410T8R	BFTX0410T8L	TRX08
SCTR10	SCTL10	CTR12	●	.625	.625	6.000	.625	.625	.591	BFTX0410T8R	BFTX0410T8L	TRX08
SCTR12	SCTL12	CTR12	●	.750	.750	6.000	.750	.750	.591	BFTX0410T8R	BFTX0410T8L	TRX08
SCTR1010	SCTL1010	CTR12	★	10.0	10.0	150.0	10.0	10.0	15.0	BFTX0410T8R	BFTX0410T8L	TRX08
SCTR1212	SCTL1212	CTR12	★	12.0	12.0	150.0	12.0	12.0	15.0	BFTX0410T8R	BFTX0410T8L	TRX08
SCTR1616	SCTL1616	CTR12	★	16.0	16.0	150.0	16.0	16.0	15.0	BFTX0410T8R	BFTX0410T8L	TRX08

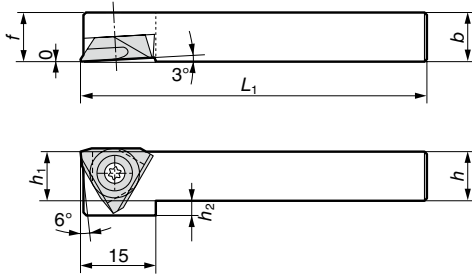
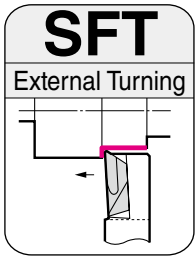
● = USA stocked item

★ = Worldwide Warehouse item







External Turning



Parts

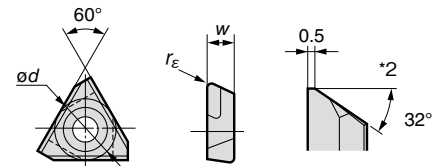
	
	(For Torx Holes)
Screw	Wrench
TFR33○○	BFTX0410NSW RT08

Holder

Cat. No.	Stock	Dimensions (mm)						Applicable Insert
		h	b	L ₁	f	h ₁	h ₂	
SFT R1010	●	10	10	120	10	10	3	TFR33○○
SFT R1212	●	12	12	120	12	12	1	
SFT R1616	●	16	16	120	16	16	—	
SFT R2020	●	20	20	120	20	20	—	

Insert

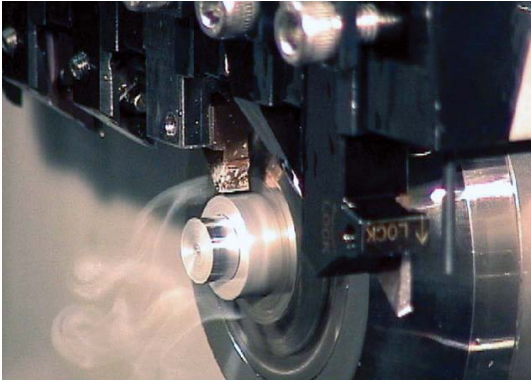
Cat. No.	Stock	Dimensions (mm)			Holder
	ACZ150	ød	w	r _ε	
TF R3300	●	9.525	4.76	—	SFT R○○○○
TF R3305	●	9.525	4.76	0.05	
TF R3315	●	9.525	4.76	0.15	
TF R3320	●	9.525	4.76	0.20	



*1 Max. depth-of-cut is 4.0 mm.

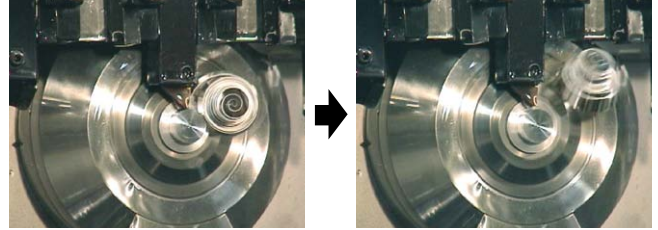
*2 Indicates angle when setting the holder.

SGW Type



Characteristics

- For high efficiency machining of Brass and Aluminum work that have small diameters with long shanks
- Coin-shaped chip produced does not adhere to holder



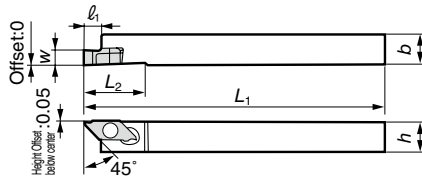
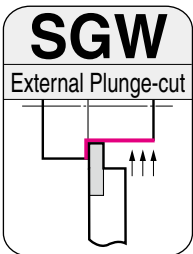
Application Examples

	SGW Type Machining Time 2.8secs! (Half of conv.)	Holder: SGWR1212 Insert: KGVR500 Work: Aluminum A5056 Conditions: Spindle Speeds: $n=4,000\text{min}^{-1}$ Feed Rate: $f=0.1\text{mm/rev}$

- Recommended Conditions
- Applicable Work Material : Aluminum, Brass, Carbon Steel, Stainless Steel, etc.
 - Spindle Speeds : $4,000$ to $6,000\text{min}^{-1}$
(please maintain spindle speeds set)
 - Feed Rates : 0.05 to 0.15mm/rev

* Please ensure that the machine has enough spindle power to prevent machine stoppages during machining; especially when machining Carbon Steel and Stainless Steel workpieces.

External Plunge-cut



Holder

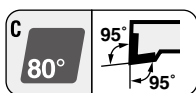
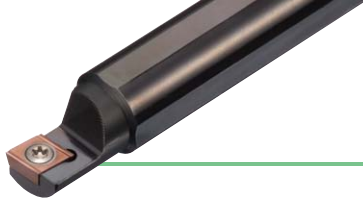
Cat. No.	Stock	Dimensions (mm)					Screw	Recommended Tightening Torque (N·m)	Wrench
		h	b	L ₁	l ₁	L ₂			
SGW R1212	●	12	12	120	6.5	24	BFTX0410T8R	1.1	TRX08
SGW R1616	●	16	16	120	6.5	24			

Parts

Screw	Wrench

Insert

Cat. No.	Dimensions (mm)	
	W	AC530U
KGVR400	4.0	●
KGVR500	5.0	●
KGVR600	6.0	●



SEC-Round Shank Tool Holders

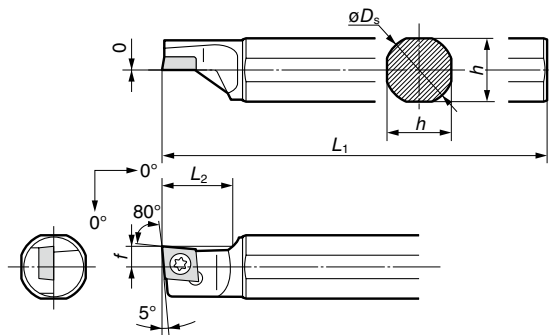
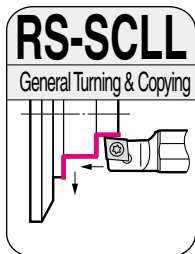
RS-SCLL Type



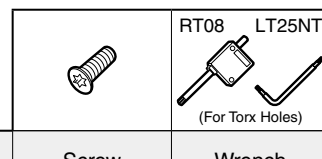
Characteristics

- Shank diameters from $\varnothing 14$ to $\varnothing 25$ are stocked. Holders can be fitted on machines of different makes.
- Bars can be mounted from the rear of the sleeve to increase the tooling range.

General Turning



Parts



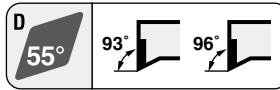
Holder

Above figures show left hand tools.

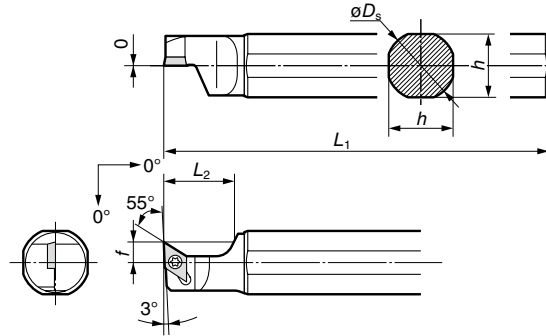
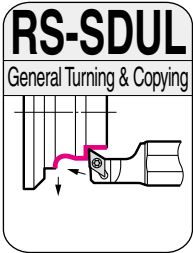
Cat. No.	Stock	Dimensions (mm)						Applicable Insert	Screw	Wrench
		$\varnothing D_s$	h	L_1	f	L_2				
RS15H-SCLL06	●	15.875	15	100	6.0	20	CC□□0602	BFTX02507NT	RT08	
RS19X-SCLL06	●	19.05	18	120	6.0	20				
RS20X-SCLL06X	●	20	19	95	6.0	20				
RS20X-SCLL06	●	20	19	120	6.0	20				
RS22X-SCLL06	●	22	21	120	6.0	20				
RS25X-SCLL06	●	25	24	120	6.0	20				
RS25M-SCLL06	●	25.4	24	150	6.0	20	CC□□09T3	BFTX0408NT	LT25NT	
RS15H-SCLL09	●	15.875	15	100	6.0	20				
RS19X-SCLL09	●	19.05	18	120	6.0	20				
RS20X-SCLL09S	●	20	19	95	6.0	20				
RS20X-SCLL09	●	20	19	120	6.0	20				
RS22X-SCLL09	●	22	21	120	6.0	20				
RS25X-SCLL09	●	25	24	120	6.0	20				
RS25M-SCLL09	●	25.4	24	150	6.0	20				

* Right handed or neutral handed inserts are applicable. [Insert selection](#) From D25

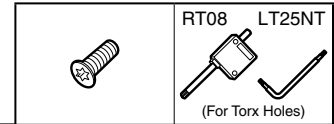
RS-SDUL/RS-SDXL Type



General Turning



Parts

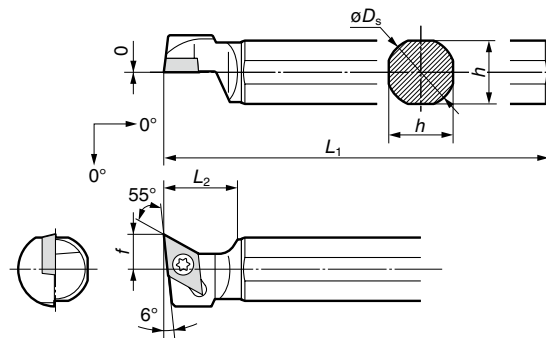
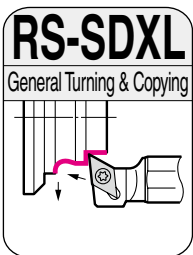


Holder

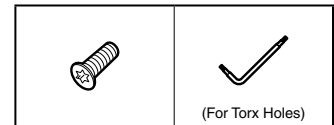
Above figures show left hand tools.

Cat. No.	Stock	Dimensions (mm)						Applicable Insert	Screw	Wrench
		ϕD_s	h	L_1	f	L_2				
RS14F-SDUL07	●	14	13	80	6.0	20	DC□□0702	BFTX02507NT	RT08	
RS15H-SDUL07	●	15.875	15	100	6.0	20				
RS16F-SDUL07	●	16	15	80	6.0	20				
RS16X-SDUL07	●	16	15	120	6.0	20				
RS19X-SDUL07	●	19.05	18	120	6.0	20				
RS20X-SDUL07S	●	20	19	95	6.0	20				
RS20X-SDUL07	●	20	19	120	6.0	20				
RS22X-SDUL07	●	22	21	120	6.0	20	DC□□11T3	BFTX0410NT	LT25NT	
RS19X-SDUL11	●	19.05	18	120	10.0	20				
RS20X-SDUL11S	●	20	19	95	10.0	20				
RS20X-SDUL11	●	20	19	120	10.0	20				
RS22X-SDUL11	●	22	21	120	10.0	20				
RS25X-SDUL11	●	25	24	120	10.0	20				
RS25M-SDUL11	●	25.4	24	150	10.0	20				

* Right handed or neutral handed inserts are applicable. [Insert selection](#) From D20



Parts



Holder

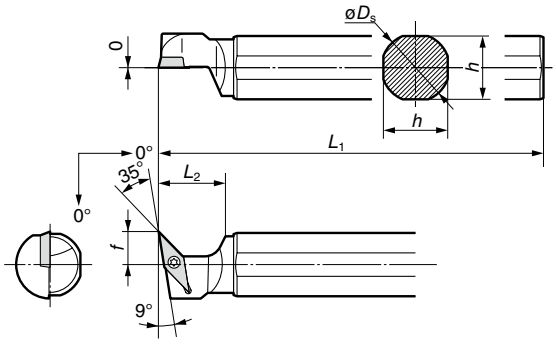
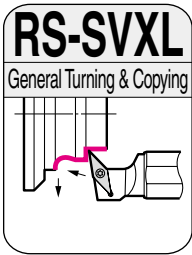
Above figures show left hand tools.

Cat. No.	Stock	Dimensions (mm)						Applicable Insert	Screw	Wrench
		ϕD_s	h	L_1	f	L_2				
RS19X-SDXL11	●	19.05	18	120	10.0	20	DC□□11T3	BFTX0410NT	LT25NT	
RS20X-SDXL11S	●	20	19	95	10.0	20				
RS20X-SDXL11	●	20	19	120	10.0	20				
RS25X-SDXL11	●	25	24	120	10.0	20				

* Right handed or neutral handed inserts are applicable. [Insert selection](#) From D20



General Turning



Parts

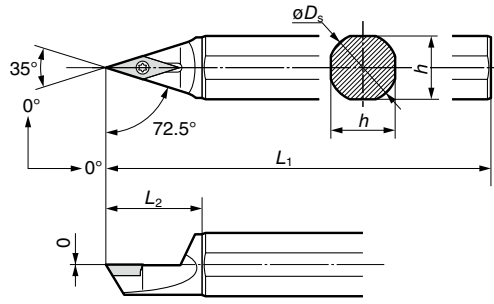
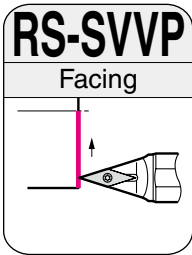
	(For Torx Holes)
Screw	Wrench
BFTX02507NT	RT08

Holder

Above figures show left hand tools.

Cat. No.	Stock	Dimensions (mm)						Applicable Insert
		ϕD_s	h	L_1	f	L_2		
RS15H-SVXL11	●	15.875	15	100	10.0	20	VC□□1103	
RS19X-SVXL11	●	19.05	18	120	10.0	20		
RS20X-SVXL11S	●	20	19	95	10.0	20		
RS20X-SVXL11	●	20	19	120	10.0	20		
RS22X-SVXL11	●	22	21	120	10.0	20		
RS25X-SVXL11	●	25.4	24	150	10.0	20		

* Right handed or neutral handed inserts are applicable. [Insert selection](#) From D32



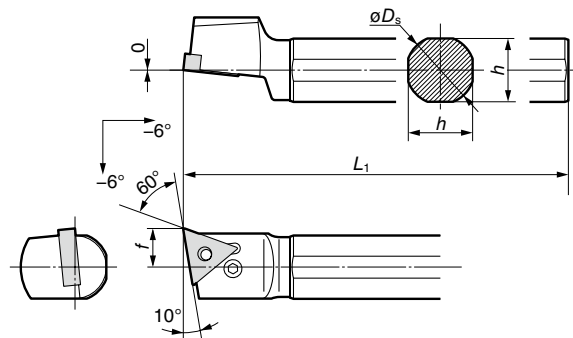
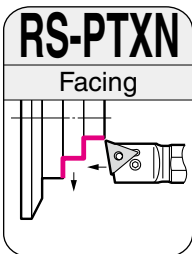
Parts

	(For Torx Holes)
Screw	Wrench
BFTX02507NT	RT08

Holder

Cat. No.	Stock	Dimensions (mm)						Applicable Insert
		ϕD_s	h	L_1	f	L_2		
RS19X-SVVPN11	●	19.05	18	120	9.0	27	VP□□1103	
RS22X-SVVPN11	●	22	21	120	10.5	27		

[Insert selection](#) D33



Parts

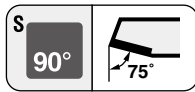
		(For Hexagonal Holes)
Lever Pin	Screw	Wrench
LCL33NT	LCS33NT	LH020NT

Holder

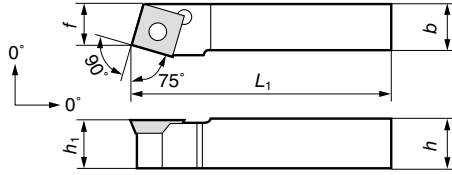
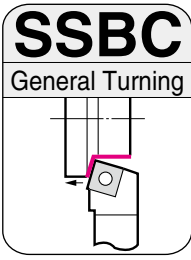
Above figures show left hand tools.

Cat. No.	Stock	Dimensions (mm)						Applicable Insert
		ϕD_s	h	L_1	f			
RS19X-PTXNL16	●	19.05	18	120	11.0		TN□□1604	
RS20X-PTXNL16	●	20	19	120	11.0			
RS25M-PTXNL16	●	25.4	24	150	13.0			

* Right handed or neutral handed inserts are applicable. [Insert selection](#) From B54



External Turning



Holder

Above figures show right hand tools.

Cat. No.	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
SSBC R/L1010-07	●	●	10	10	100	9	10	SC□□0702
SSBC R/L1212-09	●	●	12	12	100	11	12	SC□□09T3
SSBC R/L1616-09	●	●	16	16	100	15	16	SC□□09T3
SSBC R/L2020-09	●	●	20	20	125	19	20	SC□□09T3

Parts

Screw	Recommended Tightening Torque (N·m)	Wrench
BFTX0307N	2.0	TRX10
BFTX0409N	3.4	TRX15

Insert (Coated Carbide / Cermet / SUMIDIA)

7° Relief G-Class

SCGT FX	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC530U				
SCGT 09T302R-FX	●		9.525	0.2	
09T302L-FX	●			0.2	
09T304R-FX	●			0.4	
09T304L-FX	●			0.4	

SCGT SC	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC530U	T1000A	T1500A		
SCGT 070201MN-SC	●	●	●	7.94	
070202MN-SC	●	●	●	2.38	
SCGT 09T301MN-SC	●	●	●	<0.1	
09T302MN-SC	●	●	●	<0.2	

Values for nose radius prefixed with "<" mean minus tolerances.

7° Relief M-Class

SCMT FB	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC530U	T1500Z	T3000Z	T1000A	
SCMT 09T304N-FB	●	●	●	9.525	
09T308N-FB	●	●	●	3.97	
				0.8	

SCMT LU	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC810P	AC820P	AC630M	AC6030M	
SCMT 09T304N-LU	●	●	●	9.525	
09T308N-LU	●	●	●	3.97	
				0.4	
				0.8	

SCMT FP	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	T1500A				
SCMT 09T304N-FP	●		9.525	0.4	
09T308N-FP	●		3.97	0.8	

7° Relief M-Class

SCMT SU	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC810P	AC820P	AC830P	AC2000	
SCMT 09T304N-SU	●	●	▲	9.525	
09T308N-SU	●	●	●	3.97	
				0.4	
				0.8	

SCMT MU	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC810P	AC820P	AC630M	AC6030M	
SCMT 09T308N-MU	●	●	●	9.525	
				3.97	
				0.8	

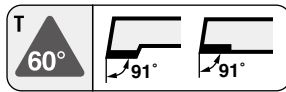
SCMW	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	AC405K	AC415K	AC420K	AC410K	
SCMW 09T308	●	●	▲	9.525	
				3.97	
				0.8	

SUMIDIA (NF Type)

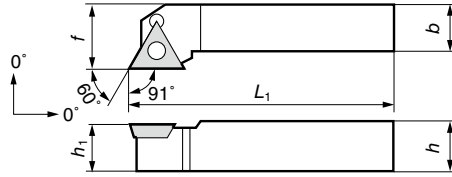
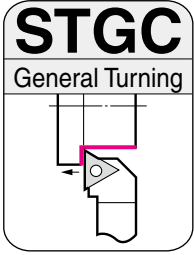
NF-SCMT	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	DA1000				
NF-SCMT 070201	●		7.94	0.1	
070202	●		2.38	0.2	
070204	●			0.4	

SUMIDIA

SCMT	Stock		Dimensions (mm)		
	Inscribed Circle	Thickness	Nose Radius		
Cat. No.	DA150				
SCMT 070201	●		7.94	0.1	
070202	●		2.38	0.2	
070204	●			0.4	
SCMT 09T301	▲		9.525	0.1	
09T302	▲		3.97	0.2	
09T304	▲			0.4	



External Turning



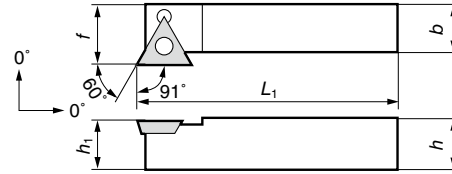
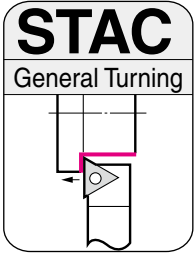
■ Holder

Above figures show right hand tools.

Cat. No.	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
STGC R/L0808-09	●		8	8	100	10	8	TC□□0902
STGC R/L1010-09	●	●	10	10	100	12	10	TC□□0902
STGC R/L1212-11	●	●	12	12	100	16	12	TC□□1102
STGC R/L1616-11	●	●	16	16	100	20	16	TC□□1102
STGC R/L2020-11	●	●	20	20	125	25	20	TC□□1102

■ Parts

Screw	Recommended Tightening Torque (N·m)	Wrench
BFTX02205N	0.5	TRX06
BFTX02506N	1.5	TRX08



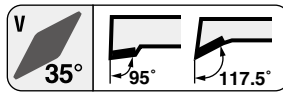
■ Holder

Above figures show right hand tools.

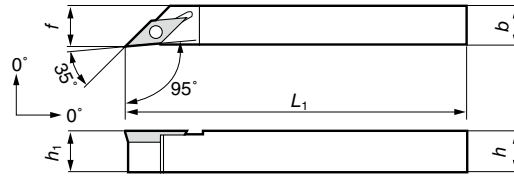
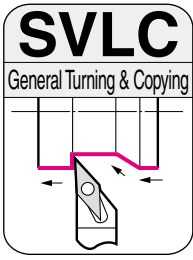
Cat. No.	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
STAC R/L0808-09		●	8	8	100	8.5	8	TC□□0902
STAC R/L1010-09	●		10	10	100	10.5	10	TC□□0902
STAC R/L1212-11	●	●	12	12	100	12.5	12	TC□□1102
STAC R/L1616-11	●	●	16	16	100	16.5	16	TC□□1102
STAC R/L2020-11	●	●	20	20	125	20.5	20	TC□□1102

■ Parts

Screw	Recommended Tightening Torque (N·m)	Wrench
BFTX02205N	0.5	TRX06
BFTX02506N	1.5	TRX08



General Turning and Copying



Holder

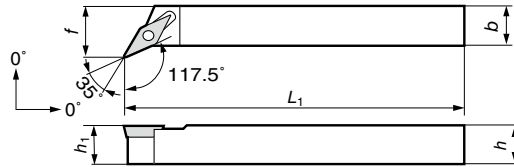
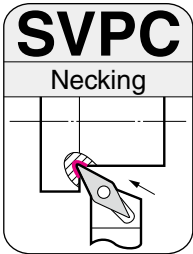
Above figures show right hand tools.

Cat. No.	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
SVLC R/L1010-H11	●	●	10	10	100	10.5	10	VC□□1103
SVLC R/L1212-H11	●	●	12	12	100	12.5	12	VC□□1103
SVLC R/L1616-H11	●	●	16	16	100	16.5	16	VC□□1103
SVLC R/L2020-K11*	●	●	20	20	125	20.5	20	VC□□1103

Parts

Screw	Wrench
BFTX02508NV	TRX08
Recommended Tightening Torque (N·m)	1.5

* Previous Cat. No SVLCR/L2020-H11



Holder

Above figures show right hand tools.

Cat. No.	Stock		Dimensions (mm)					Applicable Insert
	R	L	h	b	L ₁	f	h ₁	
SVPC R/L1010-H11	●	●	10	10	100	14.5	10	VC□□1103
SVPC R/L1212-H11	●	●	12	12	100	16.5	12	VC□□1103
SVPC R/L1616-H11	●	●	16	16	100	20.5	16	VC□□1103
SVPC R/L2020-K11*	●	●	20	20	125	24.5	20	VC□□1103

Parts

Screw	Wrench
BFTX02508NV	TRX08
Recommended Tightening Torque (N·m)	1.5

* Previous Cat. No SVLCR/L2020-H11

SPB R/L Series										
Sumitomo Cat. No.		Gage Insert	Dimensions (Inch/mm)						Insert Screw	Torx Wrench
Right Hand	Left Hand		Stock	A	B	C	E	F		
SPBR063D	SPBL063D	PBV1102	●	.375	.375	6.000	.669	.375	BFTX02505N	LT08-06
SPBR083D	SPBL083D	PBV1102	●	.500	.500	6.000	.669	.500	BFTX02505N	LT08-06
<i>SPBR1010-60</i>	<i>SPBL1010-60</i>	PBV1102	★	10.0	10.0	150.0	17.0	10.5	BFTX02505N	LT08-06
<i>SPBR1212-60</i>	<i>SPBL1212-60</i>	PBV1102	★	12.0	12.0	150.0	17.0	12.5	BFTX02505N	LT08-06

● = USA stocked item ★ = Worldwide Warehouse item

CKBR Series											
Sumitomo Cat. No.		Gage Insert	Dimensions (Inch/mm)						Clamp	Clamp Screw	Wrench
			Stock	A	B	C	E	F			
CKBR062D		KBMXR	●	.375	.375	6.000	.375	.375	CKBW16	WB4-8	LH020
CKBR082D		KBMXR	●	.500	.500	6.000	.500	.500	CKBW16	WB4-8	LH020
CKBR102D		KBMXR	●	.625	.625	6.000	.625	.625	CKBW16	WB4-8	LH020
<i>CKBR1010-16</i>		KBMXR	★	10.0	10.0	150.0	10.0	10.0	CKBW16	WB4-8	LH020
<i>CKBR1212-16</i>		KBMXR	★	12.0	12.0	150.0	12.0	12.0	CKBW16	WB4-8	LH020
<i>CKBR1616-16</i>		KBMXR	★	16.0	16.0	150.0	16.0	16.0	CKBW16	WB4-8	LH020

● = USA stocked item ★ = Worldwide Warehouse item

CKBSR Series												
Sumitomo Cat. No.		Gage Insert	Dimensions (Inch/mm)						Clamp	Clamp Screw	Wrench	
Right Hand			Stock	A	B	C	F	L ₂				L ₃
CKBSR102D		KBMXL	●	.625	.625	6.000	1.220	1.125	.393	CKBW16	WB4-8	LH020
<i>CKBSR1010-16-11</i>		KBMXL	★	10.0	16.0	150.0	31.0	28.5	10.0	CKBW16	WB4-8	LH020
<i>CKBSR1212-16-11</i>		KBMXL	★	12.0	16.0	150.0	31.0	28.5	10.0	CKBW16	WB4-8	LH020
<i>CKBSR1616-16-11</i>		KBMXL	★	16.0	16.0	150.0	31.0	28.5	16.0	CKBW16	WB4-8	LH020



Swiss Tooling Inserts

for precision turning applications:

- Cut-off
- Back Turn
- Boring/Roughing
- Boring Finishing

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USALimited Availability Item
- New Product Arriving 1st Quarter 2015

Blank Inserts for SPB Type holder (p. 201)				Uncoated	
Sumitomo Catalog #	Dim. E (mm)	Application	Fig.	BL130	
PBVX1102R-NB	17.20	General	1	●	
PBVX1102R-SB	20.14	Sharp Edge	2	●	
PBVX1102R-BB	14.20	Special	3	●	

Grooving Inserts for SPB Type holder (p. 201)			Uncoated	
Sumitomo Catalog #	Dimensions (mm)		BL130	
	Groove Depth	t		
PBVG1102R-030	0.5	0.3	●	
PBVG1102R-050	1.0	0.5	●	
PBVG1102R-100	2.0	1.0	●	

Turning Inserts for SPB Type holder (p. 201)				Uncoated	
Sumitomo Catalog #	Dim. Cutter Edge (mm)	Wiper Edge	Fig.	BL130	
PBVFW1102R	1.0	Yes	1	●	
PBVFN1102R	1.0	No	2	●	

Threading Inserts for SPB Type holder (p. 201)			Uncoated	
Sumitomo Catalog #	Dimension Pitch (mm)	Fig.	BL130	
PBVTF1102R	0.2 ~ 0.5	1	●	
PBVTB1102R	0.2 ~ 0.5	2	●	

Turning Inserts for SPB Type holder (p. 201)				Uncoated	
Sumitomo Catalog #	Dim. Cutter Edge (mm)	Wiper Edge	Fig.	BL130	
PBVBN1102R	1.0	Yes	1	★	
PBVBW1102R	1.0	No	2	★	

Turning Inserts for SPB Type holder (p. 201)				Uncoated	
Sumitomo Catalog #	Dim. Cutter Edge (mm)	Wiper Edge	Fig.	BL130	
PBVC1102L-50	1.0	Yes	1	★	
PBVC1102R-50	1.0	No	2	★	

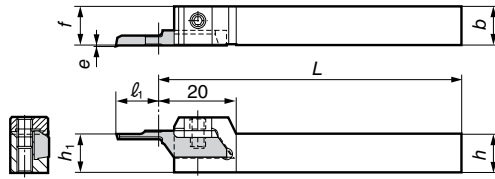


SEC-MINI Boring Tool Holders CKB Type



Sumi Small

Square Shank

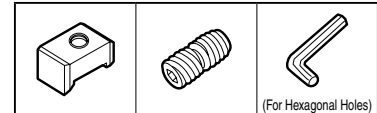


Please refer to facing page E15 for e , l_1 dimensions.

Holder

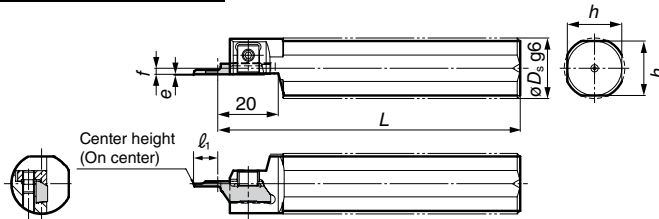
Cat. No.	Stock	Dimensions (mm)					Clamp	Double Screw	Wrench
		h	b	L	f	h_1			
CKB R1010-16	●	10	10	100	10	10	CKBW16	WB4-8	LH020
CKB R1212-16	●	12	12	125	12	12			
CKB R1616-16	●	16	16	125	16	16			
CKB R2020-16	●	20	20	125	20	20			
CKB R2525-16	●	25	25	150	25	25			

Spare Parts



Round Shank (Offset Small)

Sumi Small

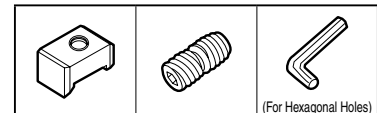


Please refer to facing page E15 for e , l_1 dimensions.

Holder

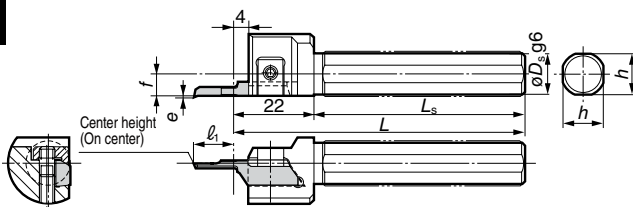
Cat. No.	Stock	Dimensions (mm)					Clamp	Double Screw	Wrench
		ϕD_s	h	L	f				
S1905H-CKB RS-16	●	19.05	17	100	2		CKBW16	WB4-8	LH020
S20H-CKB RS-16	●	20	18	100	2				
S22K-CKB RS-16	●	22	19	125	2				
S25K-CKB RS-16	●	25	23	125	2				
S254K-CKB RS-16	●	25.4	23	125	2				

Spare Parts



Round Shank

Sumi Small

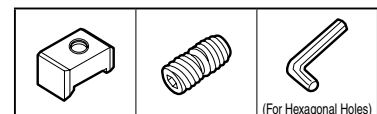


Please refer to facing page E15 for e , l_1 dimensions.

Holder

Cat. No.	Stock	Dimensions (mm)					Clamp	Double Screw	Wrench
		ϕD_s	h	L	L_s	f			
S10F-CKB R-16	●	10	9	80	58	5	CKBW16	WB4-8	LH020
S12F-CKB R-16	●	12	11	80	58	6			
S16H-CKB R-16	●	16	15	100	78	8			
S19K-CKB R-16	●	19.05	17	125	103	8			
S20K-CKB R-16	●	20	18	125	103	10			

Spare Parts



Multi-functional Autolathe Tool Twin Head Holder

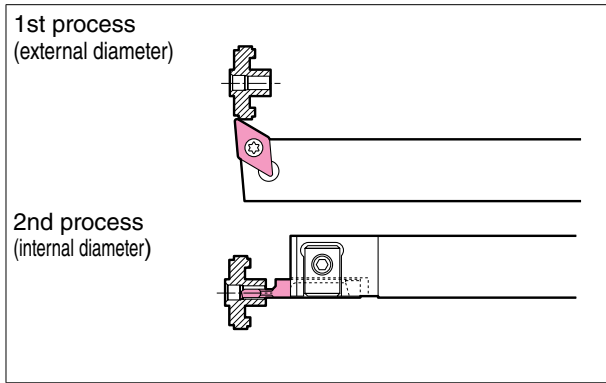


Characteristics

- 1 holder that performs 2 operations is equivalent to mounting an additional tool on the machine.
- External turning possible with the aid of a drill sleeve.
- 2 holder configurations, internal+external and internal+internal, are standard stocked items.
- Height difference of the 2 cutting edges is below 40μm which is good for high precision machining.

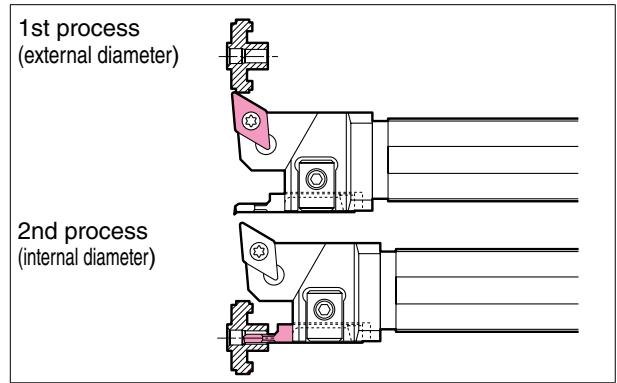
Advantage of twin-head holder

Conventional tool



- 2 different operations requiring 2 separate tools.

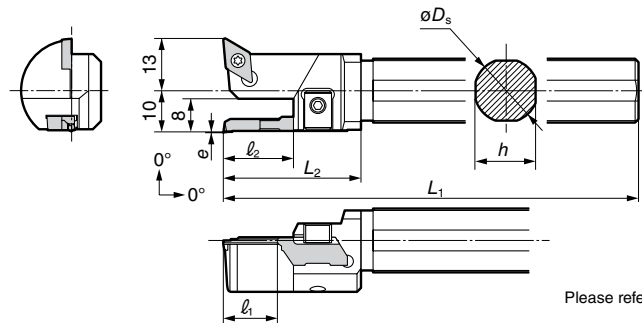
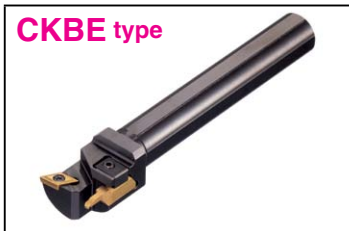
Twin head holder



- A single tool performing 2 different operations.
- Cycle time can be reduced.

Boring External Tool Holder

CKBE type



Please refer to page E13 for e.

Sumi Small

Holder (ID boring depth 6.0mm type)

Cat. No.	Stock	Dimensions (mm)						*Maximum workpiece diameter	ID Boring Insert	OD Turning Insert
		$\varnothing D_s$	h	L_1	L_2	l_1	l_2			
S1588X-CKBE-06	●	15.875	15	130	27	6	10	12.0	KBMX R0006-00 KBMX R0006-00T	DC□□070200
S16X-CKBE-06	●	16	15	130	27	6	10	12.0		
S1905X-CKBE-06	●	19.05	17	130	27	6	10	12.0		
S20X-CKBE-06	●	20	18	130	27	6	10	12.0		
S22X-CKBE-06	●	22	20	130	27	6	10	12.0		

* When machining internal diameter

Holder (ID boring depth 11.0mm type)

Cat. No.	Stock	Dimensions (mm)						*Maximum workpiece diameter	ID Boring Insert	OD Turning Insert
		$\varnothing D_s$	h	L_1	L_2	l_1	l_2			
S1588X-CKBE-11	●	15.875	15	130	32	11	15	12.0	KBMX R0011-00 KBMX R0011-00T	DC□□070200
S16X-CKBE-11	●	16	15	130	32	11	15	12.0		
S1905X-CKBE-11	●	19.05	17	130	32	11	15	12.0		
S20X-CKBE-11	●	20	18	130	32	11	15	12.0		
S22X-CKBE-11	●	22	20	130	32	11	15	12.0		

* When machining internal diameter

ID Boring Insert E15

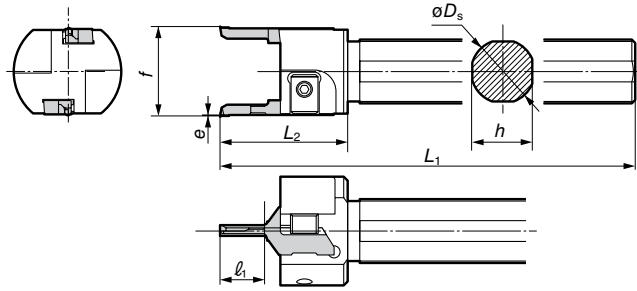
OD Turning Insert D20 to D23

Multi-functional Autolathe Tool Twin Head Holder

Sumi Small

Boring + Face Grooving

CKBB type



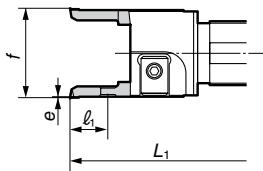
Holder

Cat. No.	Stock	Dimensions (mm)						ID Boring Insert	OD Turning Insert
		ϕD_s	h	L_1	L_2	f	ℓ_1		
S1588X-CKBB-F	●	15.875	15	130	32	22.0	11	KBMX R○○○○-○○ KBMX R○○○○-OOT	KBMF R○○○○-05
S16X-CKBB-F	●	16	15	130	32	22.0	11		
S1905X-CKBB-F	●	19.05	17	130	32	22.0	11		
S20X-CKBB-F	●	20	18	130	32	22.0	11		
S22X-CKBB-F	●	22	20	130	32	22.0	11		

* Reference for L_1 , f , and ℓ_1 are taken with KBMXR0311-OO(T) mounted.

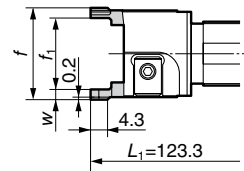
Insert selection E15

Insert Cat. Number: Using KBMXR (ID+ID) type



Cat. No.	e	ℓ_1	f	L_1
KBMX R0103-○○(T)	0.2	3	21.8	122
KBMX R01506-○○(T)	0.25	6	21.9	125
KBMX R0206-○○(T)	0.25	6	21.9	125
KBMX R0311-○○(T)*	0.3	11	22.0	130
KBMX R0411-○○(T)	0.5	11	22.4	130
KBMX R0511-○○(T)	0.7	11	22.8	130
KBMX R0420-○○(T)	0.5	20	22.4	139
KBMX R0520-○○(T)	0.7	20	22.8	139

Insert Cat. Number: Using KBMFR (Face+Face) type



Cat. No.	f	f_1	w
KBMF R0615-05	21.8	18.8	1.5
KBMF R0620-05	21.8	17.8	2.0
KBMF R0630-05	21.8	15.8	3.0

Spare Parts

For use with KBM □ R insert			For use with DC □□ insert		
		 (For Hexagonal Holes)		 (For Torx Holes)	
Clamp	Double Screw	Wrench	Screw	Wrench	Recommended Tightening Torque (N·m)
CKBW16	WB4-8	LH020	BFTX02506N	1.5	TRX08

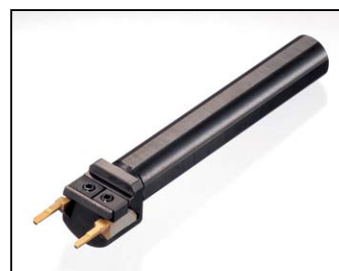
Special Holder Configurations



Int. diameter+Ext. diameter
(Square shank holder)



Inner diameter + Center drill



Int. diameter + Int. diameter
(Parallel boring holder)

Holder configurations for different workpieces or various machining requirements, such as guide holes, chamfering and external necking, can be custom-made.

Swiss Tooling Inserts (cont.)

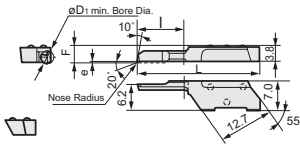
for precision turning applications:

- Cut-off
- Back Turn
- Boring Rough
- Boring Finishing

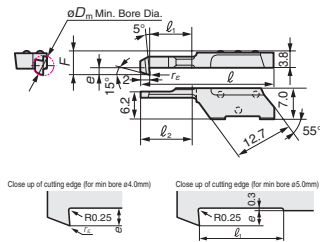
- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item
- New Product Arriving 1st Quarter 2015

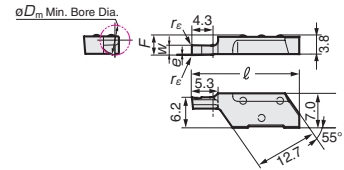
KBMXR



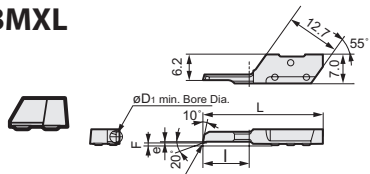
KBMZ



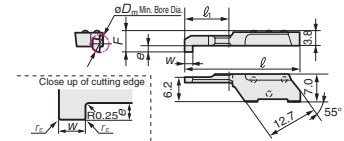
KBMFR



KBMXL



KBMG



Sumitomo Catalog #	Dimensions (mm)						ACZ310	DAZ200
	Min. Bore Dia.	F	e	Nose Radius	L	ℓ		
KBMXR0103-05	1.0	4.00	0.20	0.05	20.5	3	▲	
KBMXR0103-20	1.0	4.00	0.20	0.20	20.5	3	★	
KBMXR01506-05	1.5	4.05	0.25	0.05	23.5	6	★	
KBMXR01506-20	1.5	4.05	0.25	0.20	23.5	6	★	
KBMXR0206-05	2.0	4.05	0.25	0.05	23.5	6	▲	
KBMXR0206-20	2.0	4.05	0.25	0.20	23.5	6	★	
KBMXR0311-05	3.0	4.10	0.30	0.05	28.5	11	★	
KBMXR0311-10	3.0	4.10	0.30	0.05	28.5	11	★	★
KBMXR0311-20	3.0	4.10	0.30	0.20	28.5	11	★	★
KBMXR0411-05	4.0	4.30	0.50	0.05	28.5	11	▲	
KBMXR0411-10	4.0	4.30	0.50	0.05	28.5	11	★	★
KBMXR0411-20	4.0	4.30	0.50	0.20	28.5	11	▲	
KBMXR0511-05	5.0	4.50	0.70	0.05	28.5	11	▲	
KBMXR0511-10	5.0	4.50	0.70	0.05	28.5	11	★	★
KBMXR0511-20	5.0	4.50	0.70	0.20	28.5	11	▲	
KBMXR0520-05	5.0	4.50	0.70	0.05	37.5	20	★	
KBMXR0520-20	5.0	4.50	0.70	0.20	37.5	20	★	

Sumitomo Catalog #	Dimensions (mm)						ACZ310	ACZ150
	Min. Bore Dia.	F	e	Nose Radius	L	ℓ		
KBMXR0103-05T	1.0	4.00	0.20	0.05	20.5	3	▲	
KBMXR0103-20T	1.0	4.00	0.20	0.20	20.5	3	★	★
KBMXR01506-05T	1.5	4.05	0.25	0.05	23.5	6	★	★
KBMXR01506-20T	1.5	4.05	0.25	0.20	23.5	6	★	★
KBMXR0206-05T	2.0	4.05	0.25	0.05	23.5	6	▲	
KBMXR0206-20T	2.0	4.05	0.25	0.20	23.5	6	★	★
KBMXR0311-05T	3.0	4.10	0.30	0.05	28.5	11	★	★
KBMXR0311-20T	3.0	4.10	0.30	0.20	28.5	11	★	★
KBMXR0411-05T	4.0	4.30	0.50	0.05	28.5	11	▲	
KBMXR0411-20T	4.0	4.30	0.50	0.20	28.5	11	▲	
KBMXR0511-05T	5.0	4.50	0.70	0.05	28.5	11	▲	
KBMXR0511-20T	5.0	4.50	0.70	0.20	28.5	11	▲	

T = Free cutting

Sumitomo Catalog #	Dimensions (mm)						ACZ310
	Min. Bore Dia.	F	e	Nose Radius	L	ℓ	
KBMXL0206-05R	2.0	4.05	0.25	0.05	23.5	6	▲
KBMXL0206-20R	2.0	4.05	0.25	0.05	23.5	6	★
KBMXL0311-05	3.0	4.10	0.30	0.05	28.5	11	★
KBMXL0311-20	3.0	4.10	0.30	0.20	28.5	11	★
KBMXL0411-05R	4.0	4.30	0.50	0.05	28.5	11	▲
KBMXL0411-20R	4.0	4.30	0.50	0.20	28.5	11	▲
KBMXL0511-05	5.0	4.50	0.70	0.05	28.5	11	★
KBMXL0511-20	5.0	4.50	0.70	0.20	28.5	11	★
KBMXL0520-05	5.0	4.50	0.70	0.05	37.5	20	★
KBMXL0520-20	5.0	4.50	0.70	0.20	37.5	20	★

Sumitomo Catalog #	Dimensions (mm)						ACZ150
	Min. Bore Dia.	F	e	Nose Radius	L	Maximum groove depth	
KBMFR0615-05	6.0	4.00	0.20	0.05	21.8	4.0	★
KBMFR0620-05	6.0	4.00	0.20	0.05	21.8	4.0	★
KBMFR0630-05	6.0	4.00	0.20	0.05	21.8	4.0	★

Sumitomo Catalog #	Dimensions (mm)							ACZ310
	Min. Bore Dia.	F	e	Nose Radius	L	ℓ ₁	ℓ ₂	
KBMZR0411-05	4.0	5.10	1.10	0.05	28.5	9	11	★
KBMZR0411-20	4.0	5.10	1.10	0.20	28.5	9	11	★
KBMZR0511-05	5.0	5.10	1.30	0.05	28.5	9	11	★
KBMZR0511-20	5.0	5.10	1.30	0.20	28.5	9	11	★

Sumitomo Catalog #	Dimensions (mm)						ACZ310
	Min. Bore Dia.	F	e	Nose Radius	L	ℓ	
KBMGR0411-05	4.0	4.90	1.10	0.05	28.5	11	★
KBMGR0411-10	4.0	4.90	1.10	0.10	28.5	11	★
KBMGR0511-05	5.0	5.10	1.30	0.05	28.5	11	★
KBMGR0511-10	5.0	5.10	1.30	0.10	28.5	11	★



Positive Inserts

C

D

R

S

T

V

W

Swiss Tooling

BORING BARS

Pages 207-238



Boring Bars

BORING BARS	PAGES
Nomenclature.....	207-209
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SumiTurn T-REX.....	211
ANSI Standard Combination Boring Bars.....	212-215
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Nomenclature	228
SteelShank	229-232
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CBN Solid Carbide	273-238

A**Boring Bar Type****A**

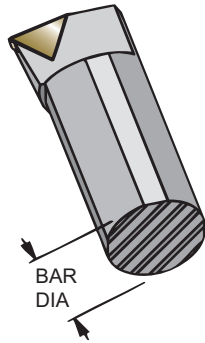
Solid Steel Bar with Coolant Hole

B

Solid Steel Bar with Anti-Vibration Device

E

Carbide Bar with Fixed Steel Head & Coolant Hole

16-**Boring Bar Diameter**

This indicates D dimensions in sixteenths (1/16).

examples:

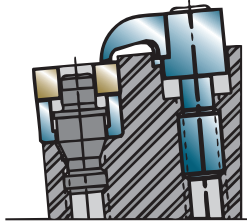
08 = 8/16 = 1/2" Diameter

16 = 16/16 = 1.0" Diameter

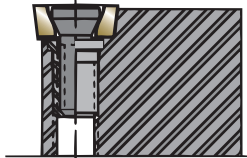
24 = 24/16 = 1-1/2" Diameter

M**Insert Holding****M**

Clamp and Lock Pin

**S**

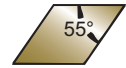
Screw Lock Only

**C****Insert Shape****C**

Diamond

**D**

Diamond

**R**

Round

**S**

Square

**T**

Triangle

**V**

Diamond

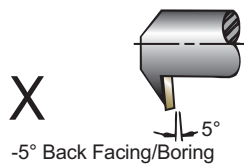
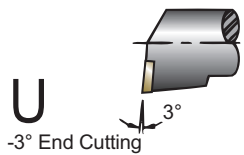
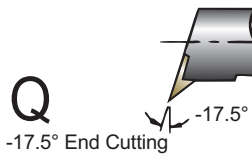
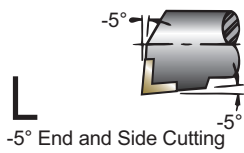
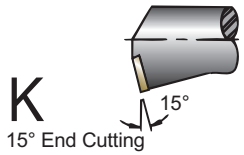
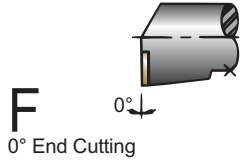
**W**

Trigon



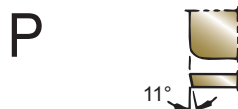
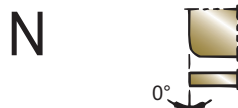
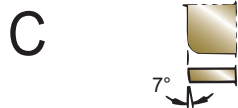
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Boring Bar Style



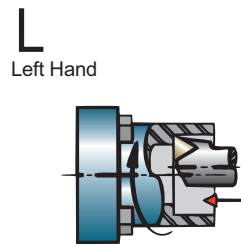
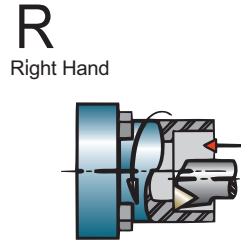
N

Insert Relief Angle



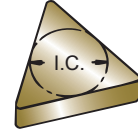
R

Hand



4

Insert Size



For equal sided inserts this indicates the inscribed circle (I.C.) in eighths (1/8).

examples,

$$6 = 6/8 = 3/4" \text{ I.C.}$$

$$4 = 4/8 = 1/2" \text{ I.C.}$$

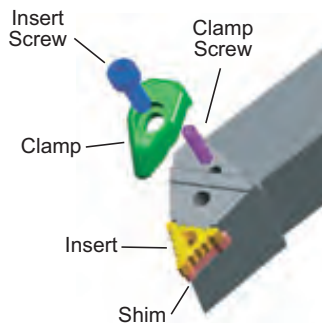
$$2.5 = 2.5/8 = 5/16" \text{ I.C.}$$



Overview – Insert Holding Methods

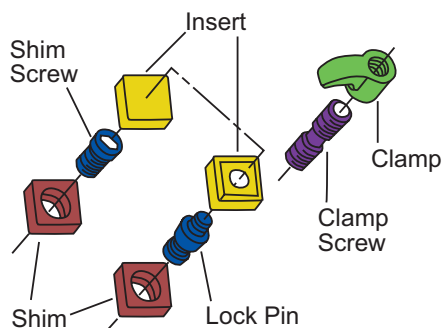
T-Rex Boring Bars

- Available in the -LU, -GU and -SU chipbreakers with grades T2000Z, AC700G, AC2000, AC820P, AC830P, AC610M, and AC630M
- Rigid clamping system ensures accurate insert indexing
- Up to 2.5mm (0.100”) depth of cut
- **Six** 55° cutting edges versus the standard **four** edges of a DNMG insert



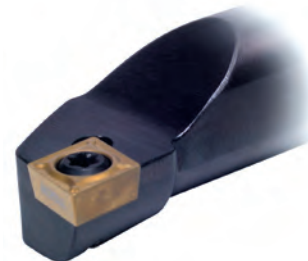
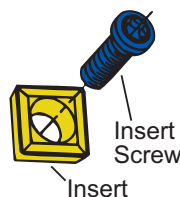
ANSI Standard Combination Boring Bars with through coolant

- Proven lock pin for negative rake geometry inserts
- Ideal for unground, negative rake inserts or utility and precision ground inserts
- Available with integral coolant delivery



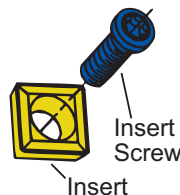
ANSI/ISO “Screw-On” Boring Bars

- Available with steel, carbide, or heavy metal shanks, ranging in size from 3/8” to 1” and coolant through the tool
- Designed to ISO-ANSI standards
- Uses TORX* insert holding screws
- Available with Anti-Vibration steel shanks



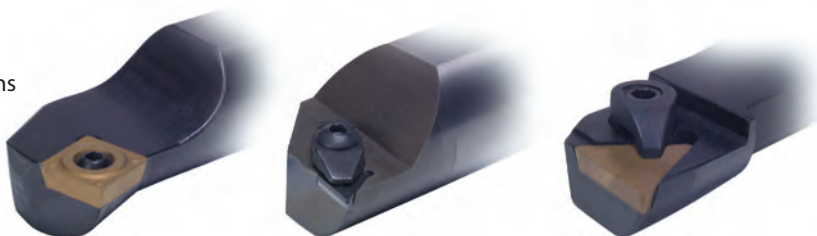
X-BAR Boring Bars

- Special dampener mechanism eliminates chatter
- Up to 6X L/D overhang (depth / bar diameter)
- Cost effective solution to carbide bars when deep hole boring
- Available in both coolant-through and non-coolant-through
- Effectively rough bores deep holes
- Bars available with CCMT, TCMT and TPMT style inserts



Sumitomo Design Boring Bars

- Styles available using negative inserts and 5°, 7°, 11° and 15° positive inserts
- For bores as small as .228” using the BSWJO design
- Available in steel or carbide shanks
- Various locking methods / unique Sumitomo designs



ANSI-ISO BORING BARS

Series: A-SCFP • A-SCLC

ANSI-ISO Boring Bars with through coolant

Boring Bars

A-SCFP			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand	11° Positive Gage Insert							Insert Screw	Torx Wrench
A06SCFPR2	–	CPMT21.51	.375	6.000	.250	4°	.480	1/8*	ST21.5	TRX08
A08SCFPR2	A08SCFPL2	CPMT21.51	.500	8.000	.312	2°	.600	1/16-27 NPT	ST21.5	TRX08
A10SCFPR2	A10SCFPL2	CPMT21.51	.625	10.000	.406	0°	.770	1/8-27 NPT	ST21.5	TRX08
A12SCFPR3	–	CPMT32.52	.750	10.000	.500	0°	.930	1/8-27 NPT	ST32.5	TRX15
A16SCFPR3	–	CPMT32.52	1.000	12.000	.640	0°	1.200	1/4-18 NPT	ST32.5	TRX15

*Through hole only. No threads.

A-SCLC			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand	7° Positive Gage Insert							Insert Screw	Torx Wrench
A06SCLCR2	A06SCLCL2	CCMT21.51	.375	6.000	.250	-15°	.480	1/8*	ST21.5	TRX08
A08SCLCR2	A08SCLCL2	CCMT21.51	.500	6.000	.312	-13°	.600	1/16-27 NPT	ST21.5	TRX08
A10SCLCR2	A10SCLCL2	CCMT21.51	.625	10.000	.406	-10°	.770	1/8-27 NPT	ST21.5	TRX08
A10SCLCR3	A10SCLCL3	CCMT32.52	.625	10.000	.406	-10°	.770	1/8-27 NPT	ST32.5	TRX15
A12SCLCR3	A12SCLCL3	CCMT32.52	.750	10.000	.500	-8°	.930	1/8-27 NPT	ST32.5	TRX15
A16SCLCR3	A16SCLCL3	CCMT32.52	1.000	12.000	.640	-7°	1.200	1/4-18 NPT	ST32.5	TRX15

*Through hole only. No threads.

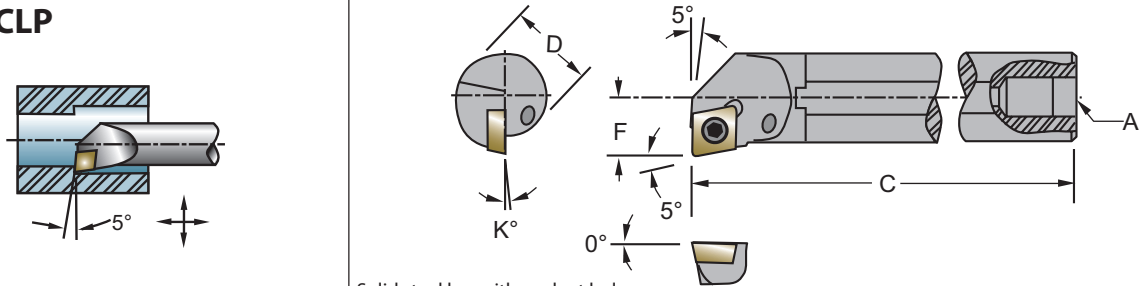
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



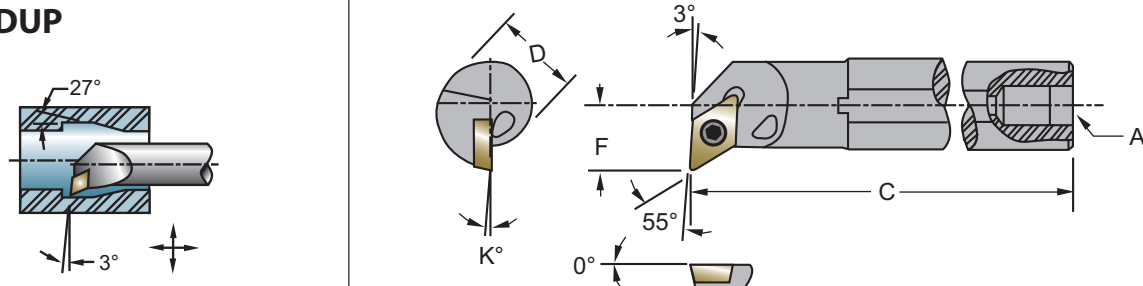
ANSI-ISO Boring Bars with through coolant

ANSI-ISO BORING BARS

Series: A-SCLP • A-SDUP

A-SCLP		 <p>Solid steel bar with coolant hole</p>								
Sumitomo Cat. No.		11° Positive Gage Insert	D	C	F	K°	Min. Bore	A	Insert Screw	Torx Wrench
Right Hand	Left Hand									
A06SCLPR2	A06SCLPL2	CPMT21.51	.375	6.000	.250	-6°	.480	1/8*	ST21.5	TRX08
A08SCLPR2	A08SCLPL2	CPMT21.51	.500	8.000	.312	-3°	.600	1/16-27 NPT	ST21.5	TRX08
A10SCLPR2	A10SCLPL2	CPMT21.51	.625	10.000	.406	-2°	.770	1/8-27 NPT	ST21.5	TRX08
A10SCLPR3	A10SCLPL3	CPMT32.52	.625	10.000	.406	-2°	.770	1/8-27 NPT	ST32.5	TRX15
A12SCLPR3	A12SCLPL3	CPMT32.52	.750	10.000	.500	-2°	.930	1/8-27 NPT	ST32.5	TRX15
A16SCLPR3	A16SCLPL3	CPMT32.52	1.000	12.000	.640	0°	1.200	1/4-18 NPT	ST32.5	TRX15

*Through hole only. No threads.

A-SDUP		 <p>Solid steel bar with coolant hole</p>								
Sumitomo Cat. No.		11° Positive Gage Insert	D	C	F	K°	Min. Bore	A	Insert Screw	Torx Wrench
Right hand	Left Hand									
A06SDUPR2	A06SDUPL2	DPMT21.51	.375	6.000	.375	-3°	.600	1/8*	ST21.5	TRX08
A08SDUPR2	A08SDUPL2	DPMT21.51	.500	8.000	.437	-2°	.730	1/16-27NPT	ST21.5	TRX08
A10SDUPR2	A10SDUPL2	DPMT21.51	.625	10.000	.500	0°	.850	1/8-27NPT	ST21.5	TRX08
A12SDUPR3	A12SDUPL3	DPMT32.52	.750	10.000	.562	0°	.980	1/8-27NPT	ST32.5	TRX15
A16SDUPR3	A16SDUPL3	DPMT32.52	1.000	12.000	.750	0°	1.300	1/4-18NPT	ST32.5	TRX15

*Through hole only. No threads.

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



A-SDUC			<p>Solid steel bar with coolant hole</p>									
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A	Insert Screw	Torx Wrench		
Right Hand	Left Hand	7° Positive Gage Insert										
A06SDUCR2	A06SDUCL2	DCMT21.51	.375	6.000	.375	-7°	.600	1/8*	ST21.5	TRX08		
A08SDUCR2	A08SDUCL2	DCMT21.51	.500	6.000	.437	-7°	.730	1/16-27 NPT	ST21.5	TRX08		
A10SDUCR2	A10SDUCL2	DCMT21.51	.625	8.000	.500	-7°	.850	1/8-27 NPT	ST21.5	TRX08		
A12SDUCR3	A12SDUCL3	DCMT32.52	.750	10.000	.562	-7°	.980	1/8-27 NPT	ST32.5	TRX15		
A16SDUCR3	A16SDUCL3	DCMT32.52	1.000	12.000	.750	-5°	1.300	1/4-18 NPT	ST32.5	TRX15		

*Through hole only. No threads.

A-SDXP			<p>Solid steel bar with coolant hole</p>									
Sumitomo Cat. No.			D	C	F	L	K°	Min. Bore	A	Insert Screw	Torx Wrench	
Right Hand	Left Hand	11° Positive Gage Insert										
A08SDXPR2	A08SDXPL2	DPMT21.51	.500	8.000	.437	8-1/2	0°	.730	1/16-27 NPT	ST21.5	TRX08	
A10SDXPR2	A10SDXPL2	DPMT21.51	.625	10.000	.500	10-1/2	0°	.850	1/8-27 NPT	ST21.5	TRX08	
A12SDXPR3	A12SDXPL3	DPMT32.52	.750	10.000	.562	10-3/4	-2°	.980	1/8-27 NPT	ST32.5	TRX15	
A16SDXPR3	A16SDXPL3	DPMT32.52	1.000	12.000	.750	12-3/4	0°	1.300	1/4-18 NPT	ST32.5	TRX15	

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts

ANSI-ISO Boring Bars with through coolant

ANSI-ISO BORING BARS

Series: A-STFC • A-STFP

A-STFC			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.		 7° Positive Gage Insert	D	C	F	K°	Min. Bore	A	 Insert Screw	 Torx Wrench
Right Hand	Left Hand									
A08STFCR2	A08STFCL2	TCMT21.51	.500	6.000	.312	-13°	.600	1/16-27 NPT	ST21.5	TRX08
A10STFCR2	-	TCMT21.51	.625	8.000	.406	-10°	.770	1/8-27 NPT	ST21.5	TRX08
A12STFCR3	A12STFCL3	TCMT32.52	.750	10.000	.500	-8°	.930	1/8-27 NPT	ST32.5	TRX15
A16STFCR3	A16STFCL3	TCMT32.52	1.000	12.000	.640	-7°	1.200	1/4-18 NPT	ST32.5	TRX15

A-STFP			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.		 11° Positive Gage Insert	D	C	F	K°	Min. Bore	A	 Insert Screw	 Torx Wrench
Right Hand	Left Hand									
A05STFPR1.8	A05STFPL1.8	TPMT1.81.51	.3125	5.000	.219	-8°	.415	3/32*	ST21.5	TRX08
A06STFPR2	A06STFPL2	TPMT21.51	.375	6.000	.250	-4°	.480	1/8*	ST21.5	TRX08
A08STFPR2	A08STFPL2	TPMT21.51	.500	8.000	.312	-2°	.600	1/16-27 NPT	ST21.5	TRX08
A10STFPR2	A10STFPL2	TPMT21.51	.625	10.000	.406	0°	.770	1/8-27 NPT	ST21.5	TRX08
A12STFPR3	A12STFPL3	TPMT32.52	.750	10.000	.500	-2°	.930	1/8-27 NPT	ST32.5	TRX15
A16STFPR3	A16STFPL3	TPMT32.52	1.000	12.000	.640	0°	1.200	1/4-18 NPT	ST32.5	TRX15

*Through hole only. No threads.

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



A-SVQB			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand	5° Positive Gage Insert								
A10SVQBR2	A10SVQBL2	VBMT221	.625	10.000	.500	-6°	.850	1/8-27 NPT	ST21.5	TRX08
A12SVQBR2	A12SVQBL2	VBMT221	.750	10.000	.562	-5°	.980	1/8-27 NPT	ST21.5	TRX08
A16SVQBR3	-	VBMT332	1.000	12.000	.750	-5°	1.300	1/4-18 NPT	ST32.5	TRX15

A-SVUB			<p>Solid steel bar with coolant hole</p>							
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand	5° Positive Gage Insert								
A12SVUBR2	A12SVUBL2	VBMT221	.750	10.000	.562	-6°	.980	1/8-27 NPT	ST21.5	TRX08
A16SVUBR3	A16SVUBL3	VBMT332	1.000	12.000	.750	-6°	1.300	1/4-18 NPT	ST32.5	TRX15
A20SVUBR3	A20SVUBL3	VBMT332	1.250	14.000	1.000	-6°	2.000	1/4-18 NPT	ST32.5	TRX15
A24SVUBR3	A24SVUBL3	VBMT332	1.500	14.000	1.250	-6°	2.250	1/4-18 NPT	ST32.5	TRX15

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts

ANSI-ISO & ISO ANSI Carbide Shank Boring Bars with through coolant

ANSI-ISO & ISO-ANSI CARBIDE SHANK

BORING BARS

Series: A-SWLP • E-SCLC

A-SWLP			<p>Solid steel bar with coolant hole</p>									
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A	Insert Screw	Torx Wrench		
Right Hand	Left Hand	11° Positive Gage Insert										
A06SWLPR2	A06SWLPL2	WPMT21.51	.375	6.000	.250	-5°	.480	1/8*	ST21.5	TRX08		
A08SWLPR2	A08SWLPL2	WPMT21.51	.500	8.000	.312	-2°	.600	1/16-27 NPT	ST21.5	TRX08		
A10SWLPR2	-	WPMT21.51	.625	10.000	.406	-3°	.770	1/8-27 NPT	ST21.5	TRX08		

*Through hole only. No threads.

ISO-ANSI CARBIDE SHANK BORING BARS

E-SCLC			<p>Solid carbide bar with fixed steel head and coolant hole</p>									
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A	Insert Screw	Torx Wrench		
Right Hand	Left Hand	7° Positive Gage Insert										
E06MSCLCR2	E06MSCLCL2	CCMT21.51	.375	6.000	.250	-15°	.480	.093*	ST21.5	TRX08		
E08RSCLCR2	E08RSCLCL2	CCMT21.51	.500	6.000	.312	-13°	.600	.093*	ST21.5	TRX08		
E10SCLCR3	E10SCLCL3	CCMT32.52	.625	10.000	.406	-10°	.770	.125*	ST32.5	TRX15		
E12SCLCR3	E12SCLCL3	CCMT32.52	.750	10.000	.500	-8°	.930	.142*	ST32.5	TRX15		
E16SCLCR3	E16SCLCL3	CCMT32.52	1.000	12.000	.640	-7°	1.200	.193*	ST32.5	TRX15		

*Through hole only. No threads.

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



BORING BARS

Series: E-STFP • E-STFC

ANSI-ISO Carbide Shank Boring Bars with through coolant

Boring Bars

E-STFP		<p>Solid carbide bar with fixed steel head and coolant hole</p>								
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand									
E05STFPR1.8	E05STFPL1.8	TPMT1.81.51	.3125	5.000	.219	-8°	.415	.062	ST21.5	TRX08

*Through hole only. No threads.

E-STFC		<p>Solid carbide bar with fixed steel head and coolant hole</p>								
Sumitomo Cat. No.			D	C	F	K°	Min. Bore	A		
Right Hand	Left Hand									
E06STFCR2	E06STFCL2	TCMT21.51	.375	6.000	.250	-15°	.480	.093*	ST21.5	TRX08
E08STFCR2	E08STFCL2	TCMT21.51	.500	6.000	.312	-13°	.600	.093*	ST21.5	TRX08
E10STFCR2	E10STFCL2	TCMT21.51	.625	8.000	.406	-10°	.770	.125*	ST21.5	TRX08
E12STFCR3	-	TCMT32.52	.750	10.000	.500	-8°	.930	.142*	ST32.5	TRX15
E16STFCR3	-	TCMT32.52	1.000	12.000	.640	-7°	1.200	.193*	ST32.5	TRX15

*Through hole only. No threads.

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts

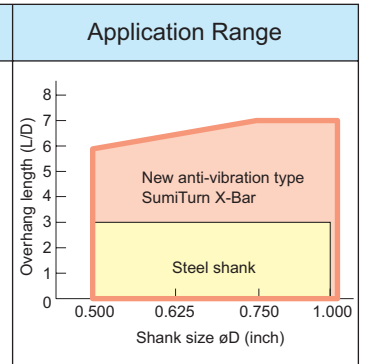
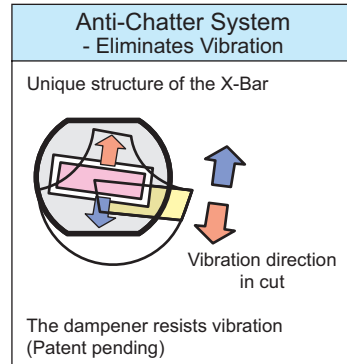
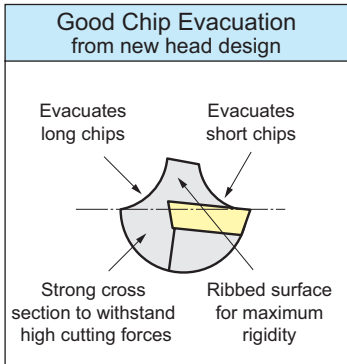


■ Features & Benefits

- Special dampener mechanism eliminates chatter.
- Up to 6X L/D overhang (depth / bar diameter).
- Cost effective solution to carbide bars when deep hole boring.
- Available in both coolant-through and non-coolant-through
- Effectively rough bores deep holes.
- **NEW** negative X-Bars now available.
- Positive X-Bar expansion now includes bars for CC--, CP--, DC--, TC--, TP--, and VB-- style inserts.



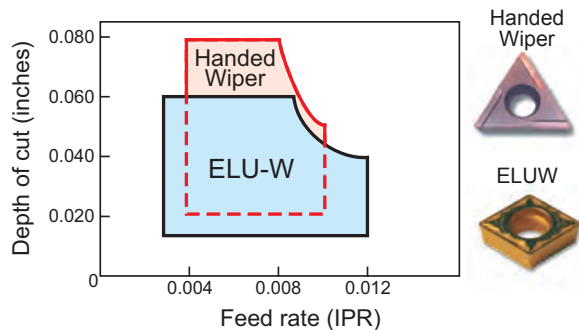
■ X-BAR Technical Information



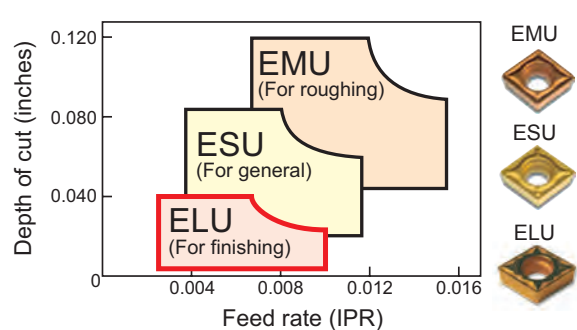
■ Recommended Overhang Length / Shank Diameter (L/D)

Chipbreakers	Type of Boring Bar	Overhang Length (L/D)						
		1	2	3	4	5	6	7
ELU, ESU, EMU (M class inserts) 	Steel shank 							
ELUW, Handed Wiper ("Wiper" style inserts) 	Steel shank 							

● "Wiper" Style Positive Inserts

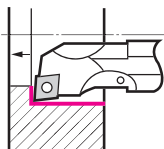


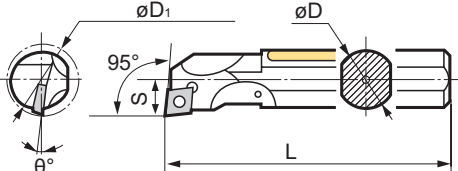
● M Class Positive Inserts






■ SumiTurn X-Bar Availability-POSITIVE

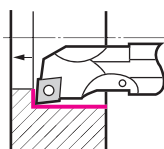


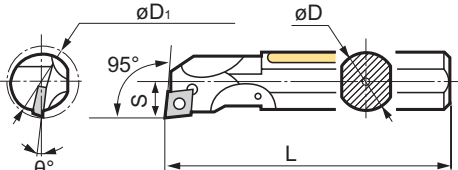


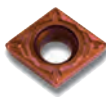


GAGE INSERT
CC□□

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°		Screw	Wrench
D08RSCLCR2	D08RSCLCL2	0.600"	0.500"	8"	0.300"	-10°	CC-21.5	BFTX02506N	TRX08
D10SSCLCR3	D10SSCLCL3	0.770"	0.625"	10"	0.385"	-8°	CC-32.5	BFTX0407N	TRX15
D12SSCLCR3	D12SSCLCL3	0.930"	0.750"	10"	0.465"	-7°	CC-32.5	BFTX0409N	TRX15
D16TSCLCR3	D16TSCLCL3	1.200"	1.000"	12"	0.600"	-6°	CC-32.5	BFTX0409N	TRX15

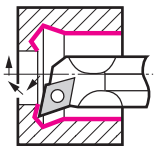


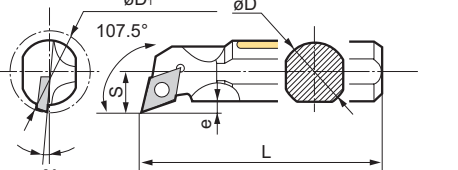





GAGE INSERT
CP□□

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°		Screw	Wrench
D10SSCLPR2	D10SSCLPL2	0.770"	0.625"	10"	0.355"	-5°	CP-21.5	BFTX0256N	TRX08
D12SSCLPR3	D12SSCLPL3	0.930"	0.750"	10"	0.450"	-4°	CP-32.5	BFTX0409N	TRX15
D16TSCLPR3	D16TSCLPL3	1.200"	1.000"	12"	0.550"	-2°	CP-32.5	BFTX0409N	TRX15



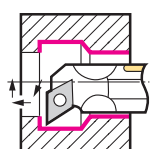


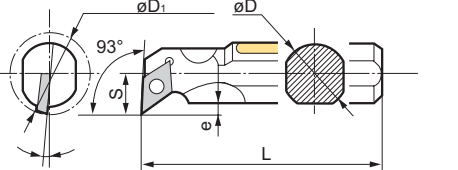



GAGE INSERT
DC□□

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°		Screw	Wrench
*B06RSDQCR2	*B06RSDQCL2	0.480"	0.375"	8"	0.276"	-8°	DC-21.5	BFTX02506N	TRX08
D08RSDQCR2	D08RSDQCL2	0.600"	0.500"	8"	0.310"	-8°	DC-21.5	BFTX02506N	TRX08
D10SSDQCR2	D10SSDQCL2	0.770"	0.625"	10"	0.430"	-6°	DC-21.5	BFTX02506N	TRX08
D12SSDQCR3	D12SSDQCL3	0.980"	0.750"	10"	0.510"	-6°	DC-32.5	BFTX0409N	TRX15
D16TSDQCR3	D16TSDQCL3	1.250"	1.000"	12"	0.670"	-6°	DC-32.5	BFTX0409N	TRX15

*Non-coolant through







GAGE INSERT
DC□□

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°		Screw	Wrench
*B06RSDUCR2	*B06RSDUCL2	0.600"	0.375"	8"	0.276"	-8°	DC-21.5	BFTX02506N	TRX08
D08RSDUCR2	D08RSDUCL2	0.730"	0.500"	8"	0.360"	-8°	DC-21.5	BFTX02506N	TRX08
D10SSDUCR2	D10SSDUCL2	0.850"	0.625"	10"	0.430"	-6°	DC-21.5	BFTX02506N	TRX08
D12SSDUCR3	D12SSDUCL3	0.980"	0.750"	10"	0.510"	-6°	DC-32.5	BFTX0409N	TRX15
D16TSDUCR3	D16TSDUCL3	1.300"	1.000"	12"	0.670"	-6°	DC-32.5	BFTX0409N	TRX15

*Non-coolant through

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°	Insert	Screw	Wrench
D08RSTUCR2	D08RSTUCL2	0.600"	0.500"	8"	0.300"	-10°	TC-21.5	BFTX02506N	TRX08
D10SSTUCR2	D10SSTUCL2	0.770"	0.625"	10"	0.385"	-8°	TC-21.5	BFTX02506N	TRX08
D12SSTUCR3	D12SSTUCL3	0.930"	0.750"	10"	0.465"	-7°	TC-32.5	BFTX0409N	TRX15
D16TSTUCR3	D16TSTUCL3	1.200"	1.000"	12"	0.600"	-6°	TC-32.5	BFTX0409N	TRX15

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°	Insert	Screw	Wrench
D08RSTUPR2	D08RSTUPL2	0.600"	0.500"	8"	0.300"	-7°	TP-22	BFTX0306A	TRX10
D10SSTUPR2	D10SSTUPL2	0.770"	0.625"	10"	0.385"	-4°	TP-22	BFTX0306A	TRX10
D12SSTUPR2	D12SSTUPL2	0.930"	0.750"	10"	0.465"	-2°	TP-22	BFTX0307A	TRX10
D16TSTUPR3	D16TSTUPL3	1.200"	1.000"	12"	0.600"	-2°	TP-33	BFTX0410A	TRX15

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°	Insert	Screw	Wrench
D10SSVUBR2	D10SSVUBL2	0.850"	0.625"	10"	0.500"	-7.5°	VB-22	BFTX02506N	TRX08
D12SSVUBR2	D12SSVUBL2	0.980"	0.750"	10"	0.562"	-7.5°	VB-22	BFTX02506N	TRX08

Sumitomo Cat. No.		Dimensions					Gage Insert	Hardware	
Right Hand	Left Hand	Min. Bore	D	L	S	θ°	Insert	Screw	Wrench
D08RSVZBR2	-	0.800"	0.500"	8"	0.532"	-7.5°	VB-22	BFTX02506N	TRX08
D10SSVZBR2	-	1.000"	0.625"	10"	0.650"	-7.5°	VB-22	BFTX02506N	TRX08




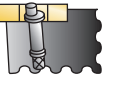
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts

SUMITOMO BORING BAR NOMENCLATURE




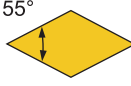
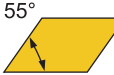
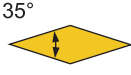

1 Type of Bar

Solid Steel	Solid Carbide
B	C







2 Clamping System

	
C Clamp Lock	M Multiple Lock
	
S Screw Clamp	
	
P Pin Lock	

3 Insert Shape

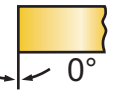

	
S	T
	
C	D
	
K	V
	
W	

4 Bar Style



	
L	K
	
F	J
	
Q	H

B **M** **T** **F** **N** **R** - **16** **4**
 1 2 3 4 5 6 7 8

5 Rake Angle

	
N	P

6 Hand of Tool

	
R	L

7 Bar Diameter

The two-digit number represents the Bar Diameter in 1/16 of an inch increments.

06 = 3/8	24 = 1 1/2	42 = 2 5/8
08 = 1/2	26 = 1 5/8	44 = 1 3/4
10 = 5/8	28 = 1 3/4	46 = 1 7/8
12 = 3/4	30 = 1 7/8	48 = 3
14 = 7/8	32 = 2	
16 = 1	34 = 2 1/8	
18 = 1 1/8	36 = 2 1/4	
20 = 1 1/4	38 = 2 3/8	
22 = 1 3/8	40 = 2 1/2	

8 Insert I.C. Size

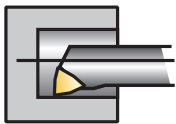
I.C. Size in 1/8 inch increments.	
Under 1/4 I.C.	Over 1/4 I.C.
2 = 5/16	2 = 1/4
5 = 5/32	3 = 3/8
6 = 3/16	4 = 1/2
	5 = 5/8
	6 = 3/4
	7 = 7/8
	8 = 1


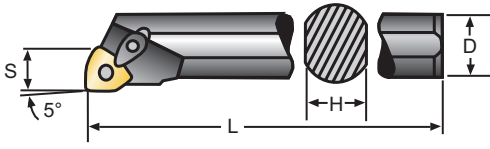
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts




BMWLN Series

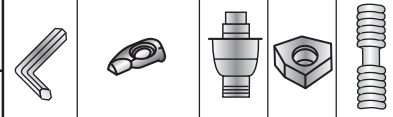
For Internal Boring





GAGE INSERT
WNMG432



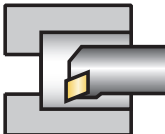
These figures show right hand tools.


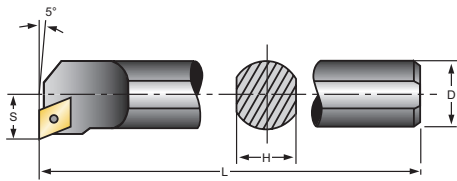
Sumitomo Cat. No.	STKD.		Dimensions						Insert		Wrench	Clamp	Pin	Shim	Screw
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Shape					
BMWLNLR/L 164	•	•	1.25	1.000	12.000	.625	.875	-15°	WN□□	43□	LH030	BCH05RM6L	BWP46	SWB422	WB6-16
BMWLNLR/L 204	•	•	1.53	1.250	14.000	.765	1.132	-14°	WN□□	43□	LH025	BCH05RM6L	BWP46	SWB422	WB6-16
BMWLNLR/L 244	•	•	1.78	1.500	14.000	.890	1.382	-12°	WN□□	43□	LH025	BCH05RM6L	BWP46	SWB422	WB6-16


Maximum overhang=3 x D

BSCLO Series

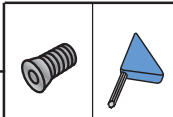
For Internal Boring





GAGE INSERT
CPGM□□□



These figures show right hand tools.

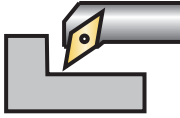
Sumitomo Cat. No.	STKD.		Dimensions						Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Size		
BSCLOR/L 062	•	•	.500	.375	6.000	.250	.336	-5°	CP□□	2.51.5□	BFTX0305A	TRX10
BSCLOR/L 082	•	•	.625	.500	6.000	.313	.462	-2°	CP□□	2.51.5□	BFTX0305A	TRX10
BSCLOR/L 103	•	•	.750	.625	6.500	.375	.586	-2°	CP□□	32□	BFTX0407A	TRX15
BSCLOR/L 123	•	•	1.000	.750	10.000	.500	.672	0°	CP□□	32□	BFTX0407A	TRX15
BSCLOR/L 164	•	•	1.125	1.000	12.000	.563	.882	-1°	CP□□	43□	BFTX0509A	TRX20

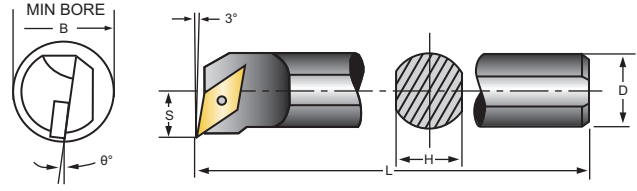
Maximum overhang = 3 x D

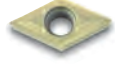
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts





BSDJO Series
For Internal Boring







GAGE INSERT
DCGT□□□

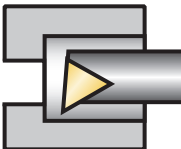



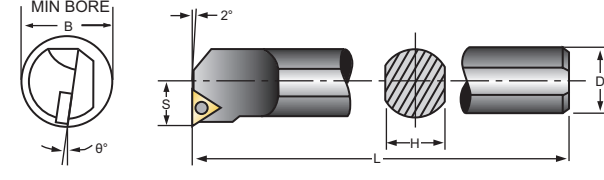
These figures show right hand tools.


Sumitomo Cat. No.	STKD.		Dimensions						Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Size		
BSDJOR/L 062	•	•	.516	.375	5.000	.306	.336	-6°				
BSDJOR/L 082	•	•	.687	.500	6.000	.368	.461	-6°	DC□□	21.5□	BFTX02506	TRX08
BSDJOR/L 102	•	•	.813	.625	8.000	.431	.586	-6°				
BSDJOR/L 123	•	•	1.000	.750	10.000	.493	.671	-6°	DC□□	32.5□	BFS0410T	TRX10

Maximum overhang = 3 x D



BSTJO Series
For Internal Boring







GAGE INSERT
T□GT□□□

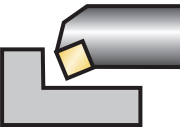



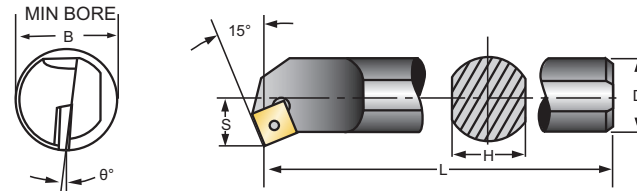
These figures show right hand tools.


Sumitomo Cat. No.	STKD.		Dimensions						Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Size		
BSTJOR/L 065	•	•	.313	.375	5.000	.156	.336	-12°	TBG□	52□		
BSTJOR/L 066	•	•	.375	.375	5.000	.188	.336	-8°		63□	BFTX0204A	TRX06
BSTJOR/L 062	•	•	.500	.375	6.000	.250	.336	-5°			BFTX0306A	
BSTJOR/L 082	•	•	.625	.500	6.000	.312	.462	-4°	TPG□	22□	BFTX0307A	TRX10
BSTJOR/L 102	•	•	.750	.625	6.500	.375	.586	-2°				
BSTJOR/L 123	•	•	1.000	.750	10.000	.500	.672	-2°		33□	BFTX0410A	TRX15
BSTJOR/L 163	•	•	1.125	1.000	12.000	.563	.882	0°				

Maximum overhang = 3 x D



BSSKO Series
For Internal Boring







GAGE INSERT
SPGG322L

These figures show right hand tools.

Sumitomo Cat. No.	STKD.		Dimensions						Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Size		
BSSKOR/L 083	•		.625	.500	6.000	.312	.462	-4°				
BSSKOR/L 103	•	•	.750	.625	6.500	.375	.586	-2°				
BSSKOR/L 123	•	•	1.000	.750	10.000	.500	.672	0°	SP□□	32□	BFTX0307A	TRX10
BSSKOR/L 163	•		1.125	1.000	12.000	.563	.882	0°				

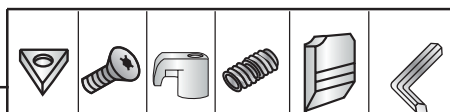
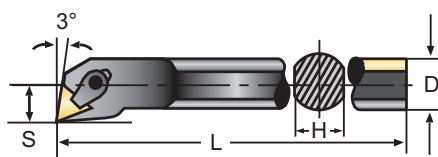
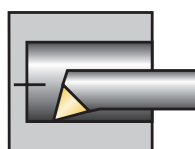
Maximum overhang = 3 x D

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



BCTJP Series

For Internal Boring



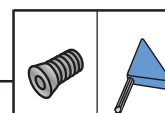
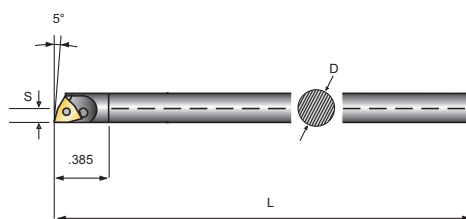
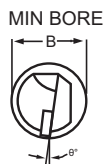
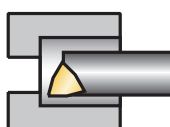
These figures show right hand tools.

Sumitomo Cat. No.	STKD.		Dimensions				Insert		Seat	Seat Screw	Clamp	Clamp Bolt	Chip Breaker Piece	Wrench
	R	L	Min. Bore B	D	L	S	H	Shape						
BCTJPR 123	•		1.000	.750	12.000	.500	.770	TPG	32□	STPD322	BF0308	CCM6BR/L	WB6-13	CBT23
BCTJPR/L 163	•		1.156	1.000	12.000	.578	.980						WB6-16	LH030
BCTJPR/L 203	•	•	1.531	1.250	14.000	.765	1.100						CBT43	
BCTJPR/L 243	•		1.781	1.500	14.000	.890	1.315							
BCTJPR 283	•		2.031	1.750	14.000	1.015	1.570							
BCTJPR 324	•		2.563	2.000	16.000	1.281	1.810							
BCTJPR 404	•		3.063	3.063	16.000	1.531	2.315	TPG	43□	STPD422	CCM8F	WB8F-30	CBT44	LH040

Maximum overhang = 3 x D

BSWJO Series

For Internal Boring



These figures show right hand tools.

Sumitomo Cat. No.	STKD.	Dimensions							Insert	Screw	Wrench
		Min. Bore B	D	H	L	S	θ°	ℓ			
BSWJOR 035	•	.228	.187	-	2.500	.062	-12°	-	WBGT 52□L	BHF0203T	TH015

Maximum overhang = 5 x D

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



CSCLO Series
For Internal Boring

Solid carbide bar with fixed steel head

GAGE INSERT
CPGT□□□

These figures show right hand tools.

Sumitomo Cat. No.	STKD.		Dimensions						Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	θ°	Shape	Size		
CSCLO/L 062	•	•	.500	.375	6.000	.250	.336	-5°	CP□□	2.51.5□	BFTX0305A	TRX10
CSCLO/L 082	•	•	.625	.500	6.000	.313	.462	-2°	CP□□	32□	BFTX0407A	TRX15
CSCLO/L 103	•	•	.750	.625	6.500	.375	.586	-2°	CP□□	32□	BFTX0407A	TRX15

Maximum overhang = 5 x D

CSTJO Series
For Internal Boring

Solid carbide bar with fixed steel head

GAGE INSERT
T□GT□□□

These figures show right hand tools.

Sumitomo Cat. No.	STKD.		Dimensions							Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	S	H	l	θ°	Shape	Size		
CSTJO/L 065	•	•	.313	.375	5.000	.1560	.336	1.781	-12°	TBG□	52□	BFTX0204A	TRX06
CSTJO/L 066	•	•	.375	.375	5.000	.1880	.336	1.781	-8°	TBG□	63□	BFTX0306A	TRX06
CSTJO/L 062	•	•	.500	.375	7.000	.2500	.336	-	-5°	TPG□	22□	BFTX0307A	TRX10
CSTJO/L 082	•	•	.625	.500	8.000	.3125	.462	-	-2°	TPG□	22□	BFTX0307A	TRX10
CSTJO/L 102	•	▲	.750	.625	10.000	.3750	.586	-	-2°	TPG□	22□	BFTX0307A	TRX10
CSTJO/L 123	•	•	1.000	.750	10.000	.5000	.672	-	-2°	TPG□	33□	BFTX0410A	TRX15

Maximum overhang = 5 x D

CSWJO Series
For Internal Boring

Solid carbide bar with fixed steel head

GAGE INSERT
WBG□52□

These figures show right hand tools.

Sumitomo Cat. No.	STKD.	Dimensions						θ°	l	Insert	Screw	Wrench
		Min. Bore B	D	H	L	S						
CSWJO/L 055	•	.234	.375	.276	5.000	.117	-12°	1.18	WBG□52□L	BFTX0203A	TRX06	
CSWJO/L 055	•	.234	.375	.276	5.000	.117	-12°	1.18	WBG□52□R	BFTX0203A	TRX06	

Maximum overhang = 5 x D

Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



SUMI-UFO Boring Bars Nomenclature

The SUMI-UFO bars feature a wider more rigid cross section for deeper cutting (up to 5 times with steel bars, up to 7 times with carbide bars) without chatter, an ultra high positive cutting edge for freer cutting and a larger chip groove for better chip flow. With these features, SUMI-UFO bars give you the ability to bore deeper holes with better surface finishes and improved chip control.

Boring Bar Identification System

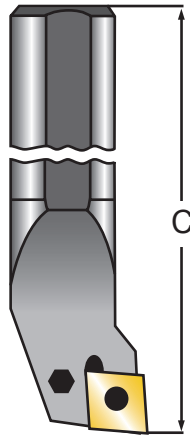
1 Type of Bar

Solid Steel	Solid Carbide
S	C

2 Shank Diameter

	06 = 3/8
	07 = 7/16
	08 = 1/2
	09 = 9/16
	10 = 5/8
	11 = 11/16
	12 = 3/4
	13 = 13/16
	14 = 7/8
	15 = 15/16
	16 = 1

3 Bar Length



C mm	Symbol
(inch) mm	
(3) 80	F
(4) 100	H
(5) 125	K
(6) 150	M
(7) 180	Q
(8) 200	R
(10) 250	S
(12) 300	T
(14) 350	U
(15.75) 400	V
(17.75) 450	W
(19.7) 500	Y
Special	X

4 Clamping System

C Clamp Lock
S Screw Clamp
P Pin Lock

S **06** **K** - **S** **T** **U** **B** **R** **5**

1 2 3 4 5 6 7 8 9

5 Insert Shape

S	T
C	D
K	V
W	

6 Bar Style

L	K
F	U
Q	

7 Insert Clearance Angle

B	C
N	P

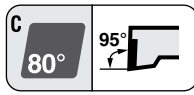
5 = 5/32
6 = 3/16
7 = 7/32
8 = 1/4
0 = 5/16

8 Hand of Tool

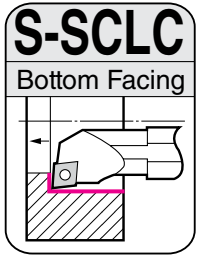
R	L



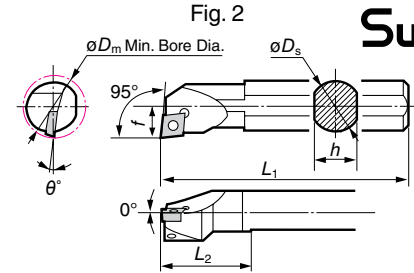
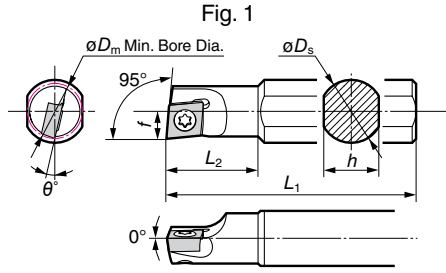
SEC-Boring Bars S-SCLC/B-SCLC Type



Finish-Medium Cut



Steel



Sumi Small

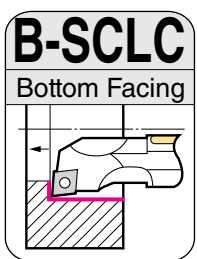
■ Spare Parts

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

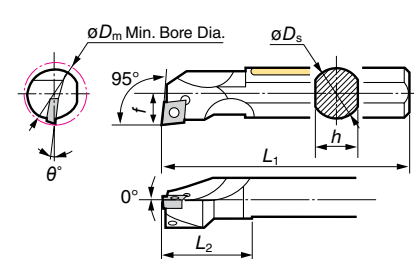
Above figures show right hand tools.

Shank	Cat. No.	Conventional Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
			R	L		ϕD_m	ϕD_s	h	L_1	f	L_2					
Steel	S08H-SCLC R/L03X1-05	—	●	●	5	8	7	100	2.5	24	-15	1	CC □□03X1□□	BFTX016033	0.2	TRX06
	S08H-SCLC R/L03X1-06	—	●	●	6	8	7	100	3.0	28	-13	1	CC □□04X1□□	BFTX0203N	0.5	
	S08H-SCLC R/L04X1-07	—	●	●	7	8	7	100	3.5	32	-13	1	CC □□04X1□□	BFTX0203N	0.5	
	S08H-SCLC R/L04X1-08	—	●	●	8	8	7	100	4.0	37	-11	1	CC □□04X1□□	BFTX0203N	0.5	
	S08H-SCLC R/L0602-10	S08H-SCLC R/L06	●	●	10	8	7	100	5.5	19	-13	2	CC □□0602□□	BFTX02505N	1.1	TRX08
	S10K-SCLC R/L0602-12	S10K-SCLC R/L06-12	●	●	12	10	9	125	6.0	21	-12		CC □□0602□□	BFTX02506N	1.5	
	S10K-SCLC R/L0602-13	S10K-SCLC R/L06	▲	▲	13	10	9	125	7.0	21	-12		CC □□0602□□	BFTX02506N	1.5	
	S12M-SCLC R/L0602-14	S12M-SCLC R/L06-14	●	●	14	12	11	150	7.0	25	-10	2	CC □□09T3□□	BFTX0407N	3.0	TRX15
	S12M-SCLC R/L0602-16	S12M-SCLC R/L06	▲	▲	16	12	11	150	9.0	25	-10		CC □□09T3□□	BFTX0409N	3.4	
	S16R-SCLC R/L0602-18	—	●	●	18	16	15	200	9.0	27	-8		CC □□09T3□□	BFTX0409N	3.4	
	S16R-SCLC R/L09T3-18	—	●	●	18	16	15	200	9.0	30	-10	2	CC □□1204□□	BFTX0511N	5.0	TRX20
	S16R-SCLC R/L09T3-20	S16R-SCLC R/L09	▲	▲	20	16	15	200	11.0	30	-8		CC □□1204□□	BFTX0511N	5.0	
	S20S-SCLC R/L09T3-22	—	●	●	22	20	18	250	11.0	30	-8		CC □□1204□□	BFTX0511N	5.0	
	S20S-SCLC R/L09T3-25	S20S-SCLC R/L09	▲	▲	25	20	18	250	13.0	30	-7	2	CC □□1204□□	BFTX0511N	5.0	
	S25T-SCLC R/L09T3-27	—	●	●	27	25	23	300	13.5	35	-6	2	CC □□1204□□	BFTX0511N	5.0	
S25T-SCLC R/L1204-32	S25T-SCLC R/L12	▲	▲	32	25	23	300	17.0	38	-6	2	CC □□1204□□	BFTX0511N	5.0		

■ Spare Parts



Anti-vibration



SumiTurn

Sumi Small

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

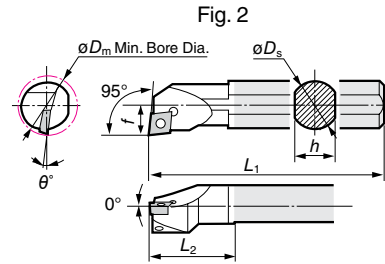
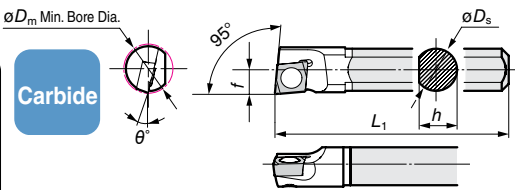
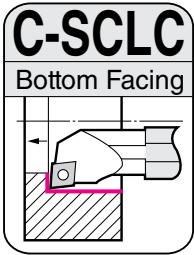
Shank	Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench	
		R	L		ϕD_m	ϕD_s	h	L_1	f	L_2					θ°
Anti-vibration	B08H-SCLC R/L0602-10	●	●	10	8	7	100	5.5	19	-13	CC □□0602□□	BFTX02505N	1.1	TRX08	
	B10K-SCLC R/L0602-12	●	●	12	10	9	125	6.0	21	-12		CC □□0602□□	BFTX02506N		1.5
	B12M-SCLC R/L0602-14	●	●	14	12	11	150	7.0	25	-10		CC □□0602□□	BFTX02506N		1.5
	B12M-SCLC R/L0602-16	●	●	16	12	11	150	9.0	25	-10	CC □□09T3□□	BFTX0407N	3.0	TRX15	
	B16R-SCLC R/L09T3-20	●	●	20	16	15	200	11.0	30	-8		CC □□09T3□□	BFTX0409N		3.4
	B20S-SCLC R/L09T3-25	●	●	25	20	18	250	13.0	30	-7		CC □□09T3□□	BFTX0409N		3.4
	B25T-SCLC R/L1204-32	●	●	32	25	23	300	17.0	38	-6	2	CC □□1204□□	BFTX0511N	5.0	

■ Spare Parts



SEC-Boring Bars C-SCLC/E-SCLC Type

Finish-Medium Cut

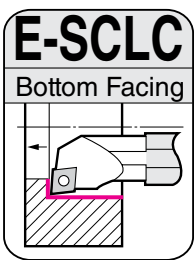


■ Holder Right handed toolholders are applicable with left handed or neutral inserts.

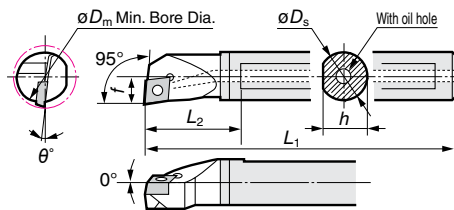
Shank	Cat. No.	Conventional Cat. No.	Stock R	Min. Bore Dia. ϕD_m	Dimensions (mm)							Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
					ϕD_s	h	L_1	f	L_2	θ°						
Carbide	C04G-SCLC R03X1-05*	C04G-SCLC R03X1-05*	●	5	4	3.8	90	2.5	—	-15	1	CC □□03X1□□	BFTX016033	0.2	TRX06	
	C05H-SCLC R03X1-06*	C05H-SCLC R03X1-06*	●	6	5	4.4	100	3.0	—	-13	1	CC □□04X1□□	BFTX0203N	0.5	TRX06	
	C06J-SCLC R04X1-07*	C06J-SCLC R04X1-07*	●	7	6	5.4	110	3.5	—	-13	1	CC □□04X1□□	BFTX0203N	0.5	TRX06	
	C07K-SCLC R04X1-08*	C07K-SCLC R04X1-08*	●	8	7	6.4	125	4.0	—	-11	1	CC □□04X1□□	BFTX0203N	0.5	TRX06	
	C08H-SCLC R0602-10	C08H-SCLC R06	●	10	8	7.0	100	5.5	19	-13	2	CC □□0602□□	BFTX02505N	1.1	TRX08	
	C10K-SCLC R0602-12	C10K-SCLC R06-12	●	12	10	9.0	125	6.0	21	-12	2	CC □□0602□□	BFTX02506N	1.5		
	C10K-SCLC R0602-13	C10K-SCLC R06	●	13	10	9.0	125	7.0	21	-12	2	CC □□0602□□	BFTX02506N	1.5		
	C12M-SCLC R0602-14	C12M-SCLC R06-14	●	14	12	11.0	150	7.0	25	-10	2	CC □□0602□□	BFTX02506N	1.5	TRX08	
	C12M-SCLC R0602-16	C12M-SCLC R06	●	16	12	11.0	150	9.0	25	-10	2	CC □□0602□□	BFTX02506N	1.5	TRX08	
	C16R-SCLC R09T3-20	C16R-SCLC R09	●	20	16	15.0	200	11.0	30	-8	2	CC □□09T3□□	BFTX0407N	3.4	TRX15	
C20S-SCLC R09T3-25	C20S-SCLC R09	●	25	20	18.0	250	13.0	35	-7	2	CC □□09T3□□	BFTX0409N	3.4			

* Requires the separately sold sleeve.

Sleeve	Stock	ϕD_s	Applicable Holder
HBB 416	●	4	C04G-SCLC R03X1-05*
HBB 516	●	5	C05H-SCLC R03X1-06*
HBB 616	●	6	C06J-SCLC R04X1-07*
HBB 716	●	7	C07K-SCLC R04X1-08*



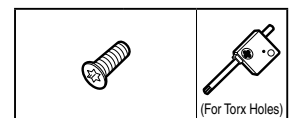
Carbide
Oil Hole



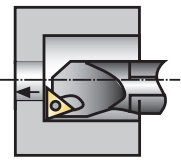
■ Holder Right handed toolholders are applicable with left handed or neutral inserts.

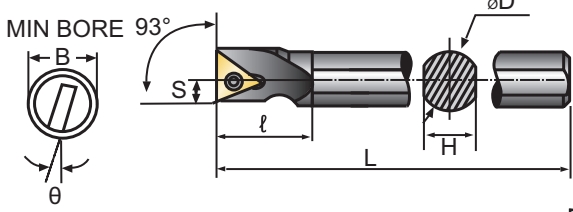
Shank	Cat. No.	Conventional Cat. No.	Stock R	Min. Bore Dia. ϕD_m	Dimensions (mm)							Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
					ϕD_s	h	L_1	f	L_2	θ°					
Carbide with oil hole	E08H-SCLC R0602-10	E08H-SCLC R06	●	10	8	7.5	100	5.5	18	-13	CC □□0602□□	BFTX02505N	1.1	TRX08	
	E10K-SCLC R0602-13	E10K-SCLC R06	●	13	10	9.5	125	7.0	19	-12		BFTX02506N	1.5		
	E12M-SCLC R0602-16	E12M-SCLC R06	●	16	12	11.5	150	9.0	25	-10	CC □□0602□□	BFTX02506N	1.5	TRX08	
	E16R-SCLC R09T3-20	E16R-SCLC R09	●	20	16	15.5	200	11.0	30	-8	CC □□09T3□□	BFTX0407N	3.4	TRX15	

■ Spare Parts




S-STUP Series
For Internal Boring







Steel shank bar



GAGE INSERT
TPGT□□□

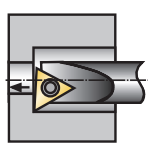
These figures show right hand tools.

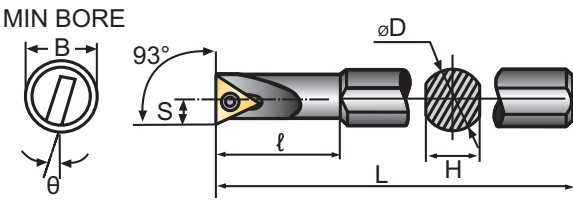



Sumitomo Cat. No.	STKD.		Dimensions							Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	H	S	ℓ	θ°	Shape	Size		
S06K-STUPR/L6	•	•	.375	.375	5.000	.336	.1875	1.250	-10°	TPG□	63□	BFTY02205	TRX06
S06M-STUPR/L8	•	•	.500	.375	6.000	.336	.250	—	-8°	TPG□	21.5□	BFTX02507	TRX08
S08M-STUPR/L8	•	•	.625	.500	6.000	.461	.3125	—	-6°	TPG□	21.5□	BFTX02507	
S10Q-STUPR/L8	•	•	.750	.625	7.000	.591	.625	—	-2°	TPG□	21.5□	BFTX02507	
S12S-STUPR/L8	•	•	1.000	.750	10.000	.669	.500	—	-4°	TPG□	21.5□	BFTX02507	
S16T-STUPR/L8	•	•	11.125	1.000	12.000	.832	.5625	—	-2°	TPG□	21.5□	BFTX02507	


Maximum overhang = 5 x D

S-STUB Series
For Internal Boring







Steel shank bar



GAGE INSERT
TBGT52□

These figures show right hand tools.

Sumitomo Cat. No.	STKD.		Dimensions							Insert		Screw	Wrench
	R	L	Min. Bore B	D	L	H	S	ℓ	θ°	Shape	Size		
S06K-STUBR/L5	•	•	.313	.375	5.000	.336	.156	1.0	-12°	TBG□	52□	BFTX0204A	TRX06

Maximum overhang = 5 x D

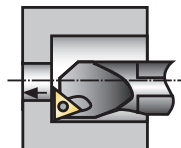
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts

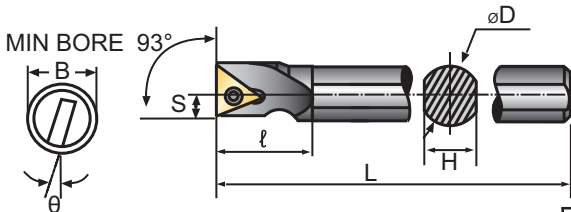
BORING BARS

Series: C-STUP • C-STUB


C-STUP Series

For Internal Boring






Solid carbide bar with fixed steel head



GAGE INSERT
TPGT□□□

These figures show right hand tools.

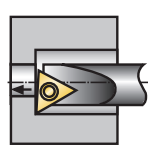


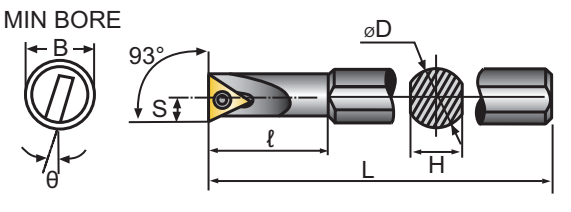
Sumitomo Cat. No.	STKD.		Dimensions							Insert		Screw	Wrench	Replacement Head
	R	L	Min. Bore B	D	L	H	S	ℓ	θ°	Shape	Size			
C06K-STUPR/L6	•	•	.375	.375	5.000	.336	.188	1.800	-10°	TPG□	63□	BFTX0204A	TRX06	RH06STUPR/L6
C06Q-STUPR/L8	•	•	.500	.375	7.000	.336	.250	—	-8°	TPG□	21.5□	BFTX02507	TRX08	RH06STUPR/L8
C08R-STUPR/L8	•	•	.625	.500	8.000	.461	.313	—	-6°	TPG□	21.5□	BFTX02507		RH08STUPR/L8
C10S-STUPR/L8	•	•	.750	.625	10.000	.591	.375	—	-2°	TPG□	21.5□	BFTX02507		RH10STUPR/L8
C12S-STUPR/L8	•	•	1.000	.750	10.000	.669	.500	—	-4°	TPG□	21.5□	BFTX02507		RH12STUPR/L8

Maximum overhang = 7 x D


C-STUB Series

For Internal Boring



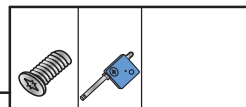


Solid carbide bar with fixed steel head



GAGE INSERT
TBGT52□

These figures show right hand tools.



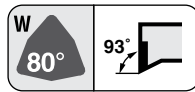
Sumitomo Cat. No.	STKD.		Dimensions							Insert		Screw	Wrench	Replacement Head
	R	L	Min. Bore B	D	L	H	S	ℓ	θ°	Shape	Size			
C06K-STUBR/L5	•	•	.313	.375	5.00	.336	.156	1.800	-12°	TBG□	52□	BFTX0204A	TRX06	RH06STUR/L5

Maximum overhang = 7 x D

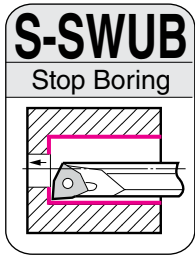
Note: For right-handed boring bars, please use left-handed or neutral inserts. For left-handed boring bars, please use right-handed or neutral inserts



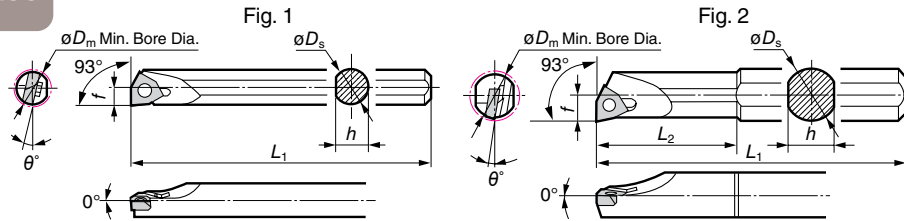
SEC-Boring Bars S-SWUB / C-SWUB Type



Small Hole Finishing



Steel



Sumi Small

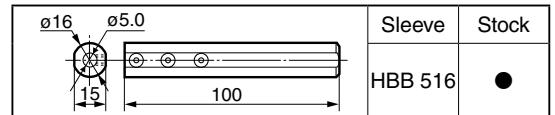
Spare Parts

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

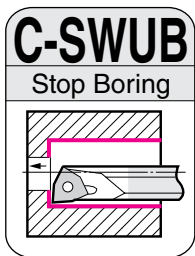
Above figures show right hand tools.

Shank	Cat. No.	Conventional Cat. No.	Stock		Dimensions (mm)							Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench	
			R	L	Min. Bore Dia. ϕD_m	ϕD_s	h	L_1	f	L_2	θ°						
Steel	S05H-SWUB R/L0601-06K	BBPW-508 RK/LK*	●	●	5.5	5	4.7	100	2.75	—	—	12	1	WB □□0601□□	BFTX0203N	0.5	TRX06
	S08H-SWUB R/L0601-06	BBPW-508 R/L	●	●	5.5	8	7.0	100	2.75	18	—	12	2				
	S08H-SWUB R/L0601-08	BBPW-508 R/L08*	●	●	8.0	8	7.0	100	4	30	—	10	2	WB □□0802□□	BFTX02205N	0.5	TRX06
	S08H-SWUB R/L0802-10	BBPW-608 R/L*	●	●	10.0	8	7.0	100	5	18	—	13					
	S10K-SWUB R/L0802-12	BBPW-610 R/L*	●	●	12.0	10	9.0	125	6	20	—	10					

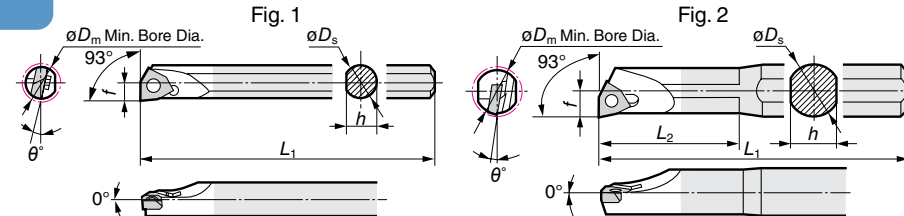
S05H-SWUB R/L0601-06K needs adaptor sleeve (HBB516)
* Product will be marked with ISO Cat. No.



Adaptor sleeve is optional



Carbide



Sumi Small

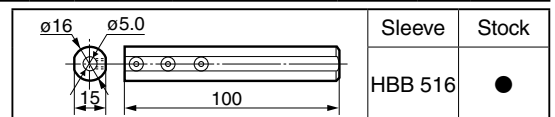
Spare Parts

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

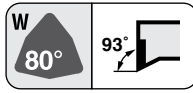
Shank	Cat. No.	Conventional Cat. No.	Stock		Dimensions (mm)							Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench	
			R	L	Min. Bore Dia. ϕD_m	ϕD_s	h	L_1	f	L_2	θ°						
Carbide	C05H-SWUB R/L0601-06K	WBPW-508 RK/LK*	●	●	5.5	5	4.7	100	2.75	—	—	12	1	WB □□0601□□	BFTX0203N	0.5	TRX06
	C08K-SWUB R/L0601-06	WBPW-508 R/L	●	●	5.5	8	7.0	125	2.75	30	—	12	2				

C05H-SWUB R/L0601-06K needs adaptor sleeve (HBB516)
* Product will be marked with ISO Cat. No.



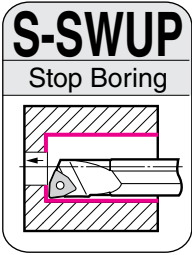
Adaptor sleeve is optional

Boring Bars



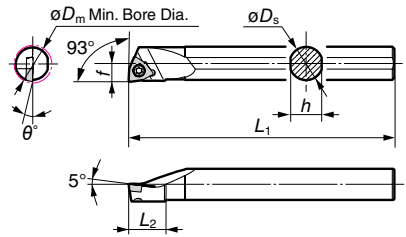
SEC-Boring Bars S-SWUP Type

Small Hole Finishing



Steel

New



Sumi Small

Spare Parts

	(For Torx Holes)

Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

Shank	Cat. No.	Stock		Dimensions (mm)							Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
		R	L	θD_m	θD_s	h	L_1	f	L_2	θ°				
Steel	<i>New</i> S12M-SWUP R/L1102-14	●		14	12	11	150	7	17	-6	WP □□1102□□	BFTX02505N	1.1	TRX08
	<i>New</i> S16Q-SWUP R/L1102-18	●		18	16	15	180	9	18	-3				
	<i>New</i> S16Q-SWUP R/L1603-18	●		18	16	15	180	9	18	-3	WP □□1603□□	BFTX0407N	3.4	TRX15
	<i>New</i> S20R-SWUP R/L1603-22	●		22	20	18	200	11	18	-2				

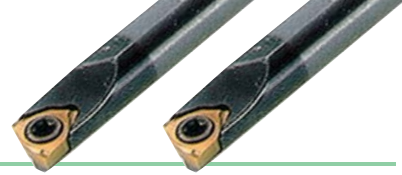
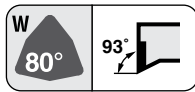
Insert (Coated / Cermet)

11° Relief M-Class

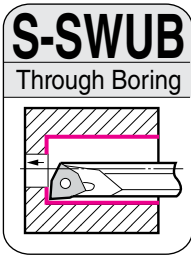
WPMT	LB	Cat. No.	Stock						Dimensions (mm)		
			AC820P	AC830P	AC6030M	AC6040M	T1500Z	T3000Z	T1500A	Inscribed circle	Thickness
<i>New</i>		WPMT 110204N-LB	●	●	●	●	●	●	6.35	2.38	0.4
<i>New</i>		WPMT 160308N-LB	●	●	●	●	●	●	9.525	3.18	0.8

Boring Bars

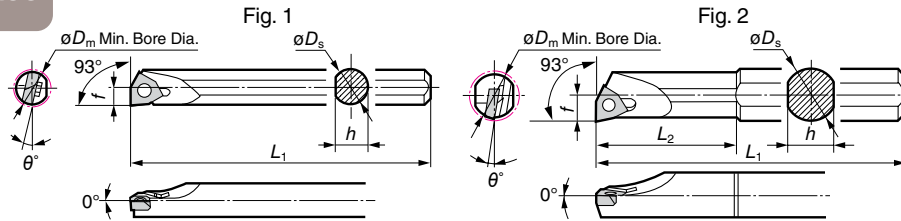
SEC-Boring Bars S-SWUB/C-SWUB Type



Small Hole Finishing



Steel

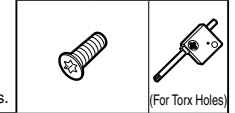


Sumi Small

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

■ Spare Parts

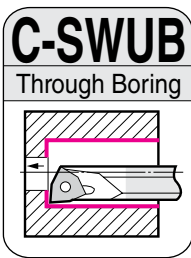


Shank	Cat. No.	Conventional Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
			R	L		ϕD_m	ϕD_s	h	L_1	f	L_2					
Steel	S05H-SWUB R/L0601-06K	BBPW-508 RK/LK*	●	●	5.5	5	4.7	100	2.75	—	-12	1	WB □□0601□□	BFTX0203N	0.5	TRX06
	S08H-SWUB R/L0601-06	BBPW-508 R/L	●	●	5.5	8	7.0	100	2.75	18	-12	2				
	S08H-SWUB R/L0601-08	BBPW-508 R/L08*	●	●	8.0	8	7.0	100	4	30	-10	2	WB □□0802□□	BFTX02205N	0.5	TRX06
	S08H-SWUB R/L0802-10	BBPW-608 R/L*	●	●	10.0	8	7.0	100	5	18	-13					
	S10K-SWUB R/L0802-12	BBPW-610 R/L*	●	●	12.0	10	9.0	125	6	20	-10					

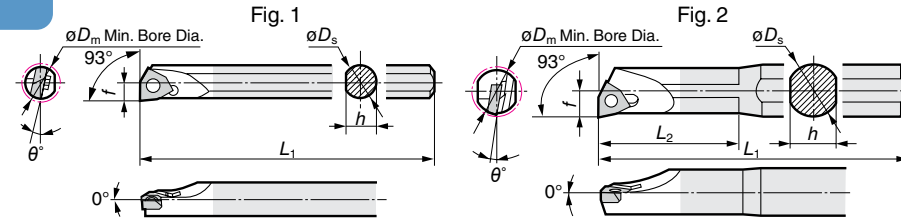
S05H-SWUB R/L0601-06K requires the sold separately sleeve HBB516.
The actual product marked with an asterisk (*) is provided with ISO Cat. No.

Sleeve	Stock
HBB 516	●

The sleeve is sold separately.



Carbide

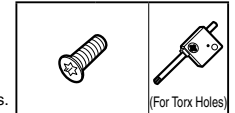


Sumi Small

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

■ Spare Parts



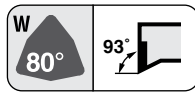
Shank	Cat. No.	Conventional Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Fig.	Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
			R	L		ϕD_m	ϕD_s	h	L_1	f	L_2					
Carbide	C05H-SWUB R/L0601-06K	WBPW-508 RK/LK*	●	●	5.5	5	4.7	100	2.75	—	-12	1	WB □□0601□□	BFTX0203N	0.5	TRX06
	C08K-SWUB R/L0601-06	WBPW-508 R/L	●	●	5.5	8	7.0	125	2.75	30	-12	2				

C05H-SWUB R/L0601-06K requires the sold separately sleeve HBB516.
The actual product marked with an asterisk (*) is provided with ISO Cat. No.

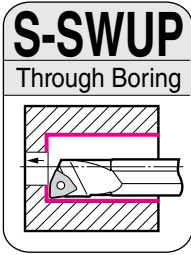
Sleeve	Stock
HBB 516	●

The sleeve is sold separately.

SEC-Boring Bars S-SWUP Type

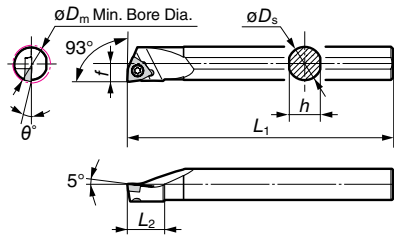


Small Hole Finishing



Steel

New



Sumi Small

■ Holder Right handed toolholders are applicable with left handed or neutral inserts.
Left handed toolholders are applicable with right handed or neutral inserts.

Above figures show right hand tools.

■ Spare Parts

Screw	(For Torx Holes)
Recommended Tightening Torque (N·m)	

Shank	Cat. No.	Stock		Dimensions (mm)							Applicable Insert	Screw	Recommended Tightening Torque (N·m)	Wrench
		R	L	Min. Bore Dia. θD_m	θD_s	h	L_1	f	L_2	θ°				
Steel	<i>New</i> S12M-SWUP R/L1102-14	●		14	12	11	150	7	17	-6	WP □□1102○○	BFTX02505N	1.1	TRX08
	<i>New</i> S16Q-SWUP R/L1102-18	●		18	16	15	180	9	18	-3				
	<i>New</i> S16Q-SWUP R/L1603-18	●		18	16	15	180	9	18	-3	WP □□1603○○	BFTX0407N	3.4	TRX15
	<i>New</i> S20R-SWUP R/L1603-22	●		22	20	18	200	11	18	-2				

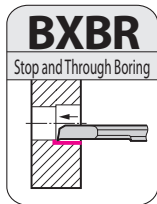
■ Insert (Coated / Cermet)

● 11° Relief M-Class

WPMT LB	Cat. No.	Stock					Dimensions (mm)				
		AC820P	AC830P	AC6030M	AC6040M	T1500Z	T3000Z	T1500A	Inscribed circle	Thickness	Nose Radius
<i>New</i>	WPMT 110204N-LB	●	●	●	●	●	●	●	6.35	2.38	0.4
<i>New</i>	WPMT 160308N-LB	●	●	●	●	●	●	●	9.525	3.18	0.8



Small Hole Finishing



■ **Characteristics**

- Economical, two-cornered insert.
- Maximum boring depth 5D (5 times the shank diameter)
- Usable at any desired overhang.
- Shank size = min. bore diameter for easy selection.
(Available from $\phi 2$ mm to $\phi 5$ mm in 0.5 mm increments.)
- KBMX Type cutting edge used, no breaker versions also available in stock.

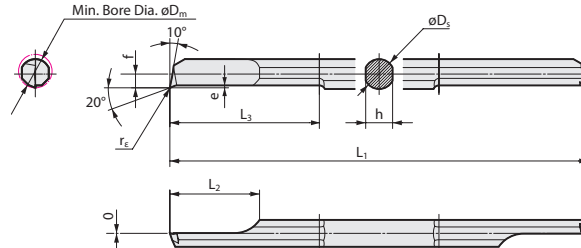
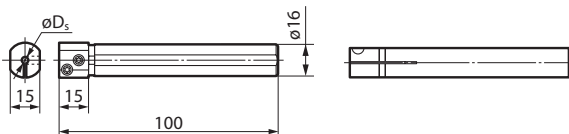


Figure shows tool with breaker.

■ **Brazed Boring Bar**

	Catalog Number	Stock	*Min. Bore Dia.		Dimensions (mm)							Applicable Sleeve
			ACZ150	ϕD_m	ϕD_s	h	L_1	f	L_2	L_3	e	
With Breaker	BXBR 02005R	★	2.0	2.0	1.8	50	0.80	6.0	10.0	0.20	0.05	HBX 2016
	BXBR 02020R	★	2.0	2.0	1.8	50	0.80	6.0	10.0	0.20	0.20	HBX 2016
	BXBR 02505R	★	2.5	2.5	2.2	50	1.05	7.5	12.5	0.20	0.05	HBX 2516
	BXBR 02520R	★	2.5	2.5	2.2	50	1.05	7.5	12.5	0.20	0.20	HBX 2516
	BXBR 03005R	★	3.0	3.0	2.7	50	1.30	9.0	15.0	0.25	0.05	HBX 3016
	BXBR 03020R	★	3.0	3.0	2.7	50	1.30	9.0	15.0	0.25	0.20	HBX 3016
	BXBR 03505R	★	3.5	3.5	3.1	60	1.55	10.5	17.5	0.25	0.05	HBX 3516
	BXBR 03520R	★	3.5	3.5	3.1	60	1.55	10.5	17.5	0.25	0.20	HBX 3516
	BXBR 04005R	★	4.0	4.0	3.6	60	1.80	12.0	20.0	0.35	0.05	HBX 4016
	BXBR 04020R	★	4.0	4.0	3.6	60	1.80	12.0	20.0	0.35	0.20	HBX 4016
	BXBR 04505R	★	4.5	4.5	4.1	70	2.05	13.5	22.5	0.35	0.05	HBX 4516
	BXBR 04520R	★	4.5	4.5	4.1	70	2.05	13.5	22.5	0.35	0.20	HBX 4516
	BXBR 05005R	★	5.0	5.0	4.5	70	2.30	15.0	25.0	0.40	0.05	HBX 5016
	BXBR 05020R	★	5.0	5.0	4.5	70	2.30	15.0	25.0	0.40	0.20	HBX 5016
	No Breaker	BXBR 02005R-NB	★	2.0	2.0	1.8	50	0.80	6.0	10.0	0.20	0.05
BXBR 02020R-NB		★	2.0	2.0	1.8	50	0.80	6.0	10.0	0.20	0.20	HBX 2016
BXBR 02505R-NB		★	2.5	2.5	2.2	50	1.05	7.5	12.5	0.20	0.05	HBX 2516
BXBR 02520R-NB		★	2.5	2.5	2.2	50	1.05	7.5	12.5	0.20	0.20	HBX 2516
BXBR 03005R-NB		★	3.0	3.0	2.7	50	1.30	9.0	15.0	0.25	0.05	HBX 3016
BXBR 03020R-NB		★	3.0	3.0	2.7	50	1.30	9.0	15.0	0.25	0.20	HBX 3016
BXBR 03505R-NB		★	3.5	3.5	3.1	60	1.55	10.5	17.5	0.25	0.05	HBX 3516
BXBR 03520R-NB		★	3.5	3.5	3.1	60	1.55	10.5	17.5	0.25	0.20	HBX 3516
BXBR 04005R-NB		★	4.0	4.0	3.6	60	1.80	12.0	20.0	0.35	0.05	HBX 4016
BXBR 04020R-NB		★	4.0	4.0	3.6	60	1.80	12.0	20.0	0.35	0.20	HBX 4016
BXBR 04505R-NB		★	4.5	4.5	4.1	70	2.05	13.5	22.5	0.35	0.05	HBX 4516
BXBR 04520R-NB		★	4.5	4.5	4.1	70	2.05	13.5	22.5	0.35	0.20	HBX 4516
BXBR 05005R-NB		★	5.0	5.0	4.5	70	2.30	15.0	25.0	0.40	0.05	HBX 5016
BXBR 05020R-NB		★	5.0	5.0	4.5	70	2.30	15.0	25.0	0.40	0.20	HBX 5016

* Boring depth L_3 or less.



■ **Adaptor Sleeve**

Cat. No.	Stock	Dimensions (mm)		Applicable Bar
		ϕD_s		
HBX 2016	★	2.0		BXBR 020SSR(-NB)
HBX 2516	★	2.5		BXBR 025SSR(-NB)
HBX 3016	★	3.0		BXBR 030SSR(-NB)
HBX 3516	★	3.5		BXBR 035SSR(-NB)
HBX 4016	★	4.0		BXBR 040SSR(-NB)
HBX 4516	★	4.5		BXBR 045SSR(-NB)
HBX 5016	★	5.0		BXBR 050SSR(-NB)

* BXB bars can be used with HBB type sleeves. Commercially available sleeves may also be used. Please see page 235 for more information regarding HBX

■ **Spare Parts (For sleeve)**

			Applicable Sleeve
Screw	Setting Screw	Wrench	
BFTX0409N	BT06035T	TRD15	HBX ____

* Adaptor sleeve is optional



BNBX Small Hole Brazed Boring Bar

Catalog No.	Series				Min. Boring Dia.	Dimensions (mm)				Applicable Adapter Sleeve	ød (mm)
	BN250	BN700	BN2000	BN7000		øD	H	L	R		
BNBX020R	★	★	★	★	2.5	2.0	1.7	40	0.2	HBX2016	2.0
BNBX025R	★	★	★	★	3.0	2.5	2.2	40	0.2	HBX2516	2.5
BNBX030R	★	★	★	★	3.5	3.0	2.7	40	0.2	HBX3016	3.0
BNBX035R	★	★	★	★	4.0	3.5	3.2	40	0.2	HBX3516	3.5
BNBX040R	★	★	★	★	4.5	4.0	3.7	40	0.2	HBX4016	4.0
BNBX045R	★	★	★	★	5.0	4.5	4.2	40	0.2	HBX4516	4.5
BNBX050R	★	★	★	★	5.5	5.0	4.7	60	0.2	HBX5016	5.0
BNBX055R	★	★	★	★	6.0	5.5	5.2	60	0.2	HBX5516	5.5
BNBX060R	★	★	★	★	6.5	6.0	5.7	60	0.2	HBX6016	6.0
BNBX065R	★	★			7.0	6.5	6.2	60	0.2	HBB6516	6.5
BNBX070R	★	★			7.5	7.0	6.7	80	0.2	HBB716	7.0
BNBX075R	★	★			8.0	7.5	7.2	80	0.2	HBB7516	7.5
BNBX080R	★	★			8.5	8.0	7.7	80	0.2	HBB816	8.0

Adapter Sleeve Hardware

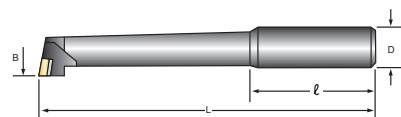
Screw	Setting Screw	Wrench	Applicable Sleeve
BFTX0409N	BT06035T	TRD15	HBX○○○○
-	BT0404	TH020	HBB○○○○

NOTE: BNBX bars can be used with HBB type sleeves, however, HBX type sleeves are recommended for bars below ø6mm

★ = Worldwide Warehouse Item

SUMIBORON Mini Boring Bars SJB Series

Jig Boring Tools



These figures show right hand tools.

Sumitomo Cat. No.	Dimensions (Inches)				Grade
	Min. Bore B	D	L	ℓ	BN250
SJB2416	.250	.375	2.000	1.1875	•
SJB2420	.3125	.375	2.375	1.1875	•
SJB2424	.375	.375	2.750	1.1875	•
SJB2432	.500	.375	2.750	1.1875	•
SJB2440	.625	.375	3.750	1.1875	•

• = USA stocked item

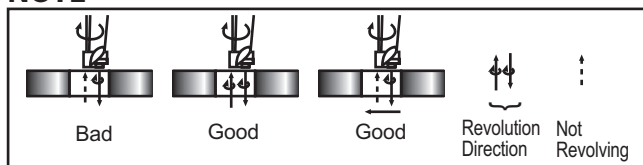
Sumitomo Cat. No.	Dimensions (mm)				Grade
	øD	ød	L	ℓ	BN250
SJB0804	8	4	45	32	★
SJB0805	8	5	45	32	★
SJB0806	8	6	50	30	★
SJB0808	8	8	60	30	★
SJB1006	10	6	50	30	★
SJB1008	10	8	60	30	★
SJB1010	10	10	70	30	★
SJB1012	10	12	70	30	★
SJB1015	10	15	70	30	★

★ = Worldwide Warehouse item

Recommended Cutting Conditions

Rotating speed	800 rpm, or more	Low speed may cause chattering and chipping on the cutting edge
Depth of cut	.001~.012 in./per side	Excessive depth of cut may cause larger tool deflection resulting in deterioration of bore size
Feed rate (f)	.001~.004 in. IPR	—

NOTE

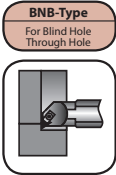
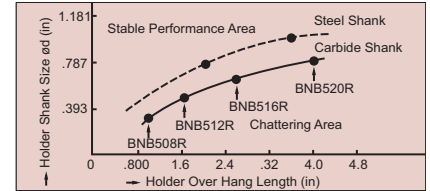
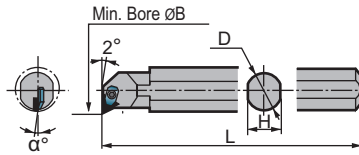


Either rotate the tool when removing or pull the tool away from work piece.



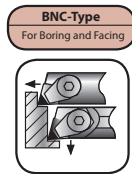
CBN Boring Series

- Solid carbide shank and head adds rigidity.
- Max. overhang, $L = 5 \times D$
- Minimal bar deformation produces excellent boring accuracy.
- Minimal vibration produces a superior surface finish.



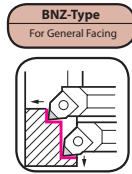
Sumitomo Cat. No.	Dimensions						Hardware				Insert		
	Right Hand	Min. Bore øB	D	L	H	α°	Clamp	Clamp Screw	Wrench	Nut	I.C.	Thick	Cat. No.
BNB508R		.394" (10mm)	.315" (8mm)	5.5" (140mm)	.275" (7mm)	-9°	BNBC	BH0306	TH020	BNB W2	.156	.125	TBGE52-
BNB512R		.591" (15)	.472" (12)	6.3" (160)	.433" (11)	-6°				BNB W4			
BNB516R		.787" (20)	.630" (16)	7" (180)	.551" (14)	-5°				BNB W7			
BNB520R		.984" (25)	.787" (20)	7" (180)	.709" (18)	-4°							

* BNB boring bars are 100% solid carbide (head and shank).



Sumitomo Cat. No.	Dimensions						Hardware				Insert		
	Right Hand	Min. Bore øB	D	L	H	α°	Clamp	Clamp Screw	Wrench	Nut	I.C.	Thick	Cat. No.
BNC508R		.394" (10mm)	.315" (8mm)	5.5" (140mm)	.275" (7mm)	-9°	BNBC	BH0306	TH020	BNB W2	.1875	.125	NU-CCGE62-
BNC510R		.472" (12)	.394" (10)	5.5" (140)	.35" (9)	-8°				BNB W4			
BNC512R		.591" (15)	.472" (12)	6.3" (160)	.433" (11)	-6°				BNB W7			
BNC516R		.787" (20)	.630" (16)	7" (180)	.551" (14)	-5°							
BNC520R		.984" (25)	.787" (20)	7" (180)	.709" (18)	-4°							

* BNC boring bars are 100% solid carbide (head and shank).



Sumitomo Cat. No.	Dimensions (mm)						
	Cat. Number	Stock	Min. Bore øDm	øDs	h	L1	θ°
BNZ606R	★	7.0	6.0	3.0	24	0.2	
BNZ608R	★	9.0	8.0	3.5	2.9	0.2	
BNZ610R	★	11.0	10.0	4.0	3.4	0.2	
BNZ612R	★	13.0	12.0	4.5	3.9	0.2	
BNZ616R	★	17.0	16.0	5.0	4.4	0.2	
BNZ620R	★	21.0	20.0	5.5	4.9	0.2	

Adapter Sleeve for BNZ type

	Sleeve	Stock	øDs	Applicable Holder
	HBB 616	○	6	BNZ 606R
HBB 816	○	8	BNZ 608R	

★ = Worldwide Warehouse item • = USA stocked item ○ = New Product Arriving January 2015



SUMIBORON Small Hole Boring Bars BSME Type

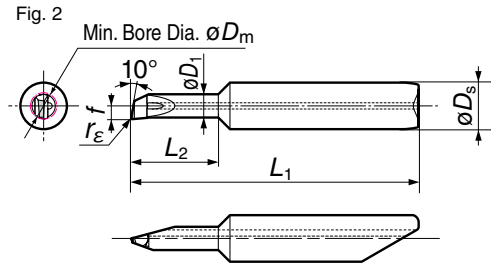
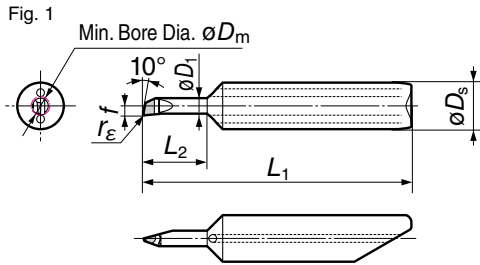
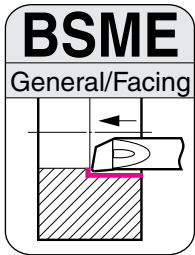
New



■ Characteristics

- Achieves the minimum bore diameter of $\phi 2.5\text{mm}$ in the boring of hardened steel.
- Achieves high-precision cutting edge positioning thanks to the newly-developed clamp mechanism
- Expands the range of small hole boring to achieve more high-efficiency machining requiring no grinding.
- Brazed Type BSME Type
Applicable to bore diameters ranging from $\phi 2.5$ to 5.0mm
- Indexable Insert Type SEXC Type
Applicable to bore diameters ranging from $\phi 4.0$ to 6.0mm

SUMIBORON



■ Brazed Boring Bar

Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Fig.	Applicable Sleeve
	BN2000			ϕD_m	ϕD_s	ϕD_1	L_1	f	L_2		
	R	L									
BSME R/L25020D2S6			2.5	6.0	2.0	32.0	1.20	5.3	0.2	1	HBSM6020
BSME R/L25020D3S6			2.5	6.0	2.0	34.5	1.20	7.8	0.2		
BSME R/L25020D4S6			2.5	6.0	2.0	37.0	1.20	10.3	0.2		
BSME R/L30020D2S6			3.0	6.0	2.5	32.8	1.45	6.3	0.2		
BSME R/L30020D3S6			3.0	6.0	2.5	35.8	1.45	9.3	0.2		
BSME R/L30020D4S6			3.0	6.0	2.5	38.8	1.45	12.3	0.2		
BSME R/L35020D2S6			3.5	6.0	3.0	33.5	1.70	7.3	0.2		
BSME R/L35020D3S6			3.5	6.0	3.0	37.0	1.70	10.8	0.2		
BSME R/L35020D4S6			3.5	6.0	3.0	40.5	1.70	14.3	0.2		
BSME R/L40020D2S6			4.0	6.0	3.5	33.9	1.95	8.3	0.2		
BSME R/L40020D3S6			4.0	6.0	3.5	37.9	1.95	12.3	0.2		
BSME R/L40020D4S6			4.0	6.0	3.5	41.9	1.95	16.3	0.2		
BSME R/L45020D2S6			4.5	6.0	4.0	35.0	2.20	9.3	0.2		
BSME R/L45020D3S6			4.5	6.0	4.0	39.5	2.20	13.8	0.2		
BSME R/L45020D4S6			4.5	6.0	4.0	44.0	2.20	18.3	0.2		
BSME R/L50020D2S6			5.0	6.0	4.5	35.8	2.45	10.3	0.2		
BSME R/L50020D3S6			5.0	6.0	4.5	40.8	2.45	15.3	0.2		
BSME R/L50020D4S6			5.0	6.0	4.5	45.8	2.45	20.3	0.2		

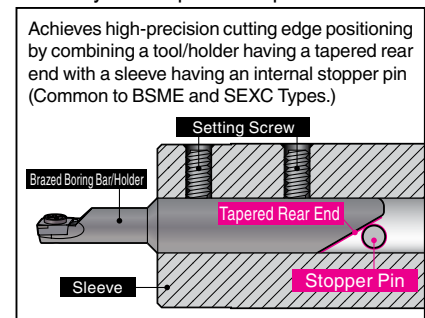
■ Adaptor Sleeve

Cat. No.	Stock	Dimensions (mm)		Setting Screw	Wrench
		ϕD_s	L_1		
		HBSM6020	6.0		

■ Alignment Jig*

Cat. No.	Stock
AFBSM60	

■ Newly Developed Clamp Mechanism

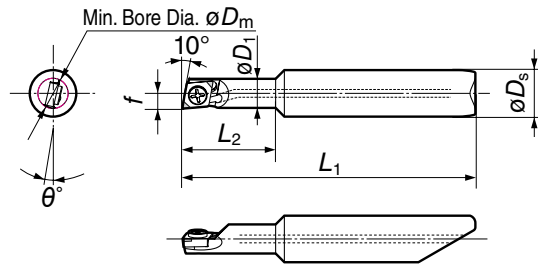
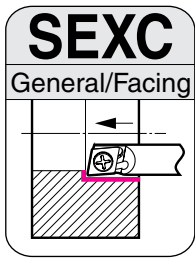


* This jig is used for centering sleeves when setting them into holders.

New

SUMIBORON Small Hole Boring Bars SEXC Type

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■ Spare Parts

Clamp Bolt	Wrench
MIB1.6-2	SDBSM
MIB1.6-2.5	
MIB1.6-3	
Recommended Tightening Torque (N·m)	0.2

■ Holder

Cat. No.	Stock		Min. Bore Dia. ϕD_m	Dimensions (mm)						Applicable Sleeve	Clamp Bolt	Recommended Tightening Torque (N·m)	Wrench
	R	L		ϕD_s	ϕD_1	L_1	f	L_2	θ°				
E06D2-SEXC R/L03-04P			4.0	6.0	3.75	33.75	1.95	8	-13	HBSM6020	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P			4.0	6.0	3.75	37.75	1.95	12	-13				
E06D2-SEXC R/L03-05P			5.0	6.0	4.75	35.25	2.45	10	-12				
E06D3-SEXC R/L03-05P			5.0	6.0	4.75	40.25	2.45	15	-12				
E06D2-SEXC R/L03-06P			6.0	6.0	5.75	36.75	2.95	12	-11				
E06D3-SEXC R/L03-06P			6.0	6.0	5.75	42.75	2.95	18	-11				

■ Insert

Cat. No.	Stock		Dimensions (mm)
	BN2000	BN7000	
2NU-ECXA 030X02LE			Nose Radius r_E 0.2
2NU-ECXA 030X02LF			0.2

LE: Honing, LF: Sharp Edge

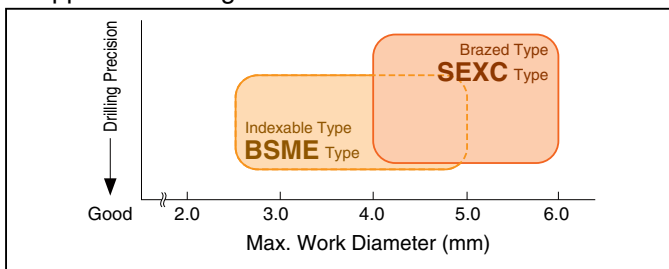
■ Adaptor Sleeve

Cat. No.	Stock	Dimensions (mm)		Setting Screw	Wrench
		ϕD_s	L_1		
HBSM6020		6.0	80	BT0506	TH025

■ Alignment Jig

Cat. No.	Stock
AFBSM60	

■ Application Range



■ Recommended Cutting Conditions

Spindle Speed n	Above 2,000min ⁻¹	May cause chattering or chipping at the cutting edge in low-speed machining.
Depth-of-cut a_p	0.01 to 0.15mm	Excessive cutting depth causes deformation of the tool, which consequently leads to dimensional accuracy deterioration.
Feed Rate f	0.01 to 0.10mm/rev	—

■ Application Example

Hardened Alloy Steel Valve Component **BSME**

The BSME type provides stable machining and a tool life that is over 2 times longer than our competitors' CBN tools.

Tool Type	Output (pcs)
Indexable Type BSME	1,700
Comp. CBN Tool	600

Output (pcs)

Work Material : Hardened Alloy Steel Valve Component (Automotive Component)
 Tool : BSME R50020D2S6 Grade : BN2000
 Cutting Conditions : $v_c=135\text{m/min}$ (7,500rpm) $f=0.02\text{mm/rev}$ $a_p=0.10\text{mm}$ Dry

Bearing Steel Small Automotive Component **SEXC**

The SEXC type provides drastically reduced tool costs and a tool life that is 1.5 times longer than our competitors' brazed CBN tools.

Tool Type	Output (pcs)
Brazed Type SEXC	1,500
Comp. Brazed CBN Tool	1,000

Output (pcs)

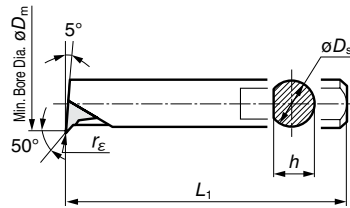
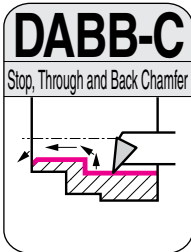
Work Material : Bearing Steel Small Automotive Component (60HRC)
 Holder : E06D2-SEXC R/L03-04P Insert : 2NU-ECXA 030X02LF (BN2000)
 Cutting Conditions : $v_c=50\text{m/min}$ (4,000rpm) $f=0.02\text{mm/rev}$ $a_p=0.02\text{mm}$ Wet

Boring Bars

SUMIDIA Small Hole Boring Bars DABB Type

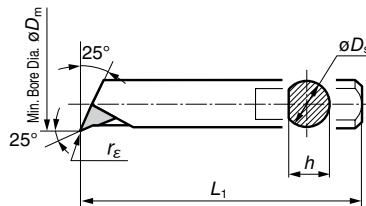
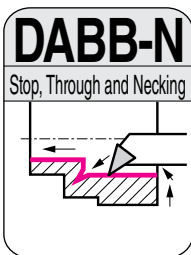
SUMIDIA

Sumi Small



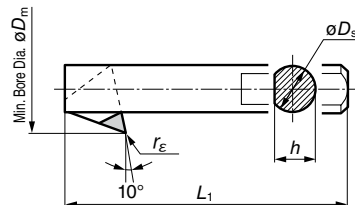
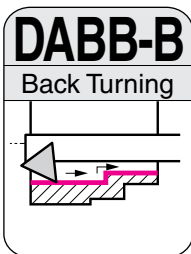
■ Brazed Bite

Cat. No.	Stock	Min. Bore Dia.	Dimensions (mm)				Applicable Sleeve
	DA2200	ϕD_m	ϕD_s	h	L_1	r_ϵ	
DABB 025CR	●	3.0	2.5	2.2	60	0.1	HBB 2516
DABB 035CR	●	4.0	3.5	3.2	60	0.1	HBB 3516
DABB 045CR	●	5.0	4.5	4.1	80	0.1	HBB 4516
DABB 060CR	●	7.0	6.0	5.2	80	0.1	HBB 616



■ Brazed Bite

Cat. No.	Stock	Min. Bore Dia.	Dimensions (mm)				Applicable Sleeve
	DA2200	ϕD_m	ϕD_s	h	L_1	r_ϵ	
DABB 025NR	●	3.0	2.5	2.2	60	0.1	HBB 2516
DABB 035NR	●	4.0	3.5	3.2	60	0.1	HBB 3516
DABB 045NR	●	5.0	4.5	4.1	80	0.1	HBB 4516
DABB 060NR	●	7.0	6.0	5.2	80	0.1	HBB 616



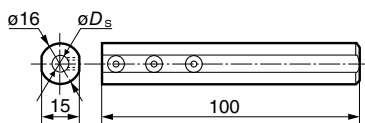
■ Brazed Bite

Cat. No.	Stock	Min. Bore Dia.	Dimensions (mm)				Applicable Sleeve
	DA2200	ϕD_m	ϕD_s	h	L_1	r_ϵ	
DABB 045BR	▲	7.0	4.5	4.0	80	0.1	HBB 4516
DABB 060BR	▲	9.0	6.0	5.5	80	0.1	HBB 616

Sumi Small

■ Spare Parts

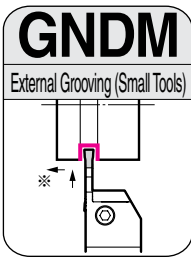
■ Adaptor Sleeve



Cat. No.	Stock	ϕD_s (mm)	Setting Screw	Wrench
HBB 2516	●	2.5	BT 0404	TH 020
HBB 3516	●	3.5		
HBB 4516	●	4.5		
HBB 616	●	6.0		

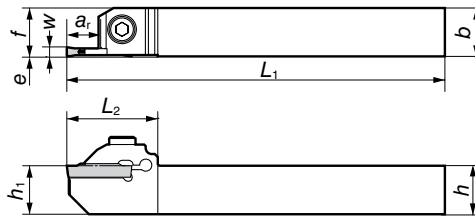
GNDM/GNDL Type (Zero Off-set)

External Multi-purpose Small Tools Type (Grooving, Turning, and Copying)



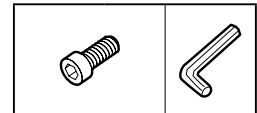
New

* Use the multi-purpose copying insert for turning (wide grooves).



Above figures show right hand tools

Spare Parts

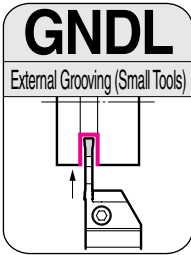


Holders

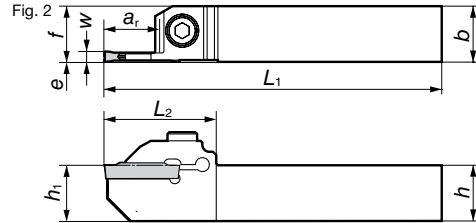
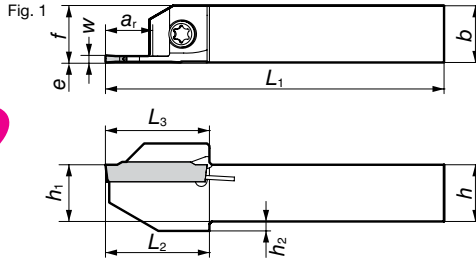
Cat. No.	Stock		Dimensions (mm)							Grooving Width (mm)	Max. Grooving Depth (mm)	Applicable Insert	Cap Screw	Recommended Tightening Torque (N·m)	Spanner
	R	L	h	b	L ₁	f	h ₁	L ₂	e	w	a _r				
GNDM R/L1616JX-1.510	●	●	16	16	120	(16)	16	26	0	1.5	10	GCM N150005-GF	BX0515	4.0	LH040
GNDM R/L1616JX-212	●	●	16	16	120	(16)	16	30	0	2.0	12	GCM □20○○-□□			
GNDM R/L1616JX-312	●	●	16	16	120	(16)	16	30	0	3.0	12	GCM □30○○-□□			

Select holders and inserts with the same grooving widths (w). Refer to F19 for applicable inserts.

External Grooving / Cut-Off Small Tools

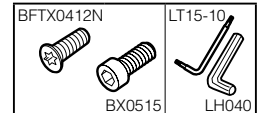


New



Above figures show right hand tools

Spare Parts



Holders

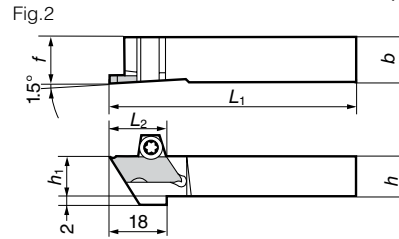
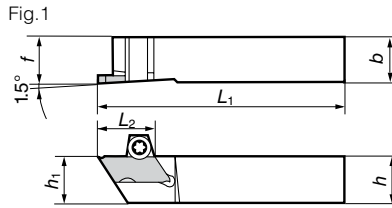
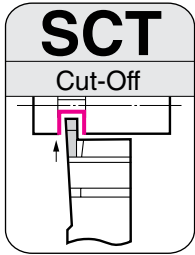
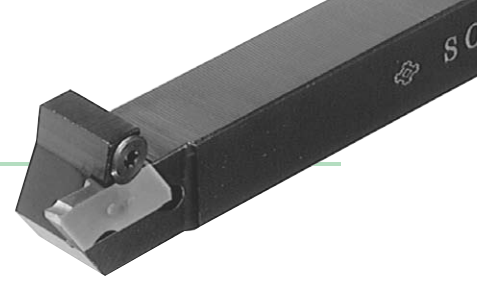
Cat. No.	Stock		Dimensions (mm)										Grooving Width (mm)	Max. Grooving Depth (mm)	Fig.	Applicable Insert	Cap Screw	Recommended Tightening Torque (N·m)	Spanner
	R	L	h	b	L ₁	f	h ₁	h ₂	L ₂	L ₃	e	w	a _r						
GNDL R/L1010JX-1.2510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	1.25	10.0	1	GCM N125005-GF	BFTX0412N	3.0	LT15-10	
GNDL R/L1010JX-1.510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	1.50	10.0		GCM N150005-GF				
GNDL R/L1010JX-210	●	●	10	10	120	(10)	10	2.0	22	22.3	0	2.00	10.0		GCM □20○○-□□				
GNDL R/L1010JX-310	●	●	10	10	120	(10)	10	2.0	22	22.3	0	3.00	10.0		GCM □30○○-□□				
GNDL R/L1212JX-1.2512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	1.25	12.0	1	GCM N125005-GF	BFTX0412N	3.0	LT15-10	
GNDL R/L1212JX-1.512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	1.50	12.0		GCM N150005-GF				
GNDL R/L1212JX-212.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	2.00	12.5		GCM □20○○-□□				
GNDL R/L1212JX-312.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	3.00	12.5		GCM □30○○-□□				
GNDL R/L1616JX-1.512.5	●	●	16	16	120	(16)	16	-	32	-	0	1.50	12.5	2	GCM N150005-GF	BX0515	4.0	LH040	
GNDL R/L1616JX-216	●	●	16	16	120	(16)	16	-	32	-	0	2.00	16.0		GCM □20○○-□□				
GNDL R/L1616JX-316	●	●	16	16	120	(16)	16	-	32	-	0	3.00	16.0		GCM □30○○-□□				

Select holders and inserts with the same grooving widths (w). Refer to F19 for applicable inserts.

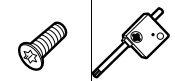
Recommended Cutting Conditions (GNDM(Small Tools)/GNDL(Small Tools)/GNDL)

Work Material	P Carbon Steel / Alloy Steel			M Stainless Steel			K Cast Iron			S Exotic Alloy	
Grade	AC830P	AC520U	AC530U	AC830P	AC520U	AC530U	AC425K	AC520U	AC530U	AC520U	AC530U
Cutting Speed v _c (m/min)	80 to 200	80 to 200	50 to 200	70 to 150	70 to 150	50 to 150	80 to 200	60 to 200	50 to 200	20 to 80	20 to 60

Grooving / Cut-Off	Breaker	Feed Rate f (mm/rev)							Turning	Breaker	MG		ML		RG	
		MG	ML	GG	GL	GF	RG	CG			Feed Rate f (mm/rev)	Depth of Cut a _p (mm)	Feed Rate f (mm/rev)	Depth of Cut a _p (mm)	Feed Rate f (mm/rev)	Depth of Cut a _p (mm)
	Grooving Widths w (mm)	1.25	1.5	2.0	3.0	4.0	5.0	6.0		Grooving Widths w (mm)	3.0	4.0	5.0	6.0	3.0	4.0
		-	-	-	-	0.01 to 0.08	-	-			0.08 to 0.25	0.4 to 1.5	0.05 to 0.18	0.3 to 1.5	0.10 to 0.40	0.3 to 1.2
		-	-	-	-	0.02 to 0.10	-	-			0.10 to 0.30	0.5 to 2.0	0.05 to 0.20	0.4 to 2.0	0.15 to 0.45	0.6 to 1.6
		-	-	0.05 to 0.25	0.03 to 0.15	0.03 to 0.12	-	0.05 to 0.20			0.12 to 0.35	0.8 to 2.5	0.08 to 0.25	0.5 to 2.5	0.20 to 0.50	0.8 to 2.0
		0.08 to 0.20	0.03 to 0.15	0.10 to 0.30	0.05 to 0.18	0.05 to 0.15	0.05 to 0.15	0.08 to 0.25			0.15 to 0.35	1.0 to 3.0	0.10 to 0.30	0.5 to 3.0	0.30 to 0.60	1.0 to 2.2



Spare Parts



Holders (Right Hand)

Above figures show right hand tools.

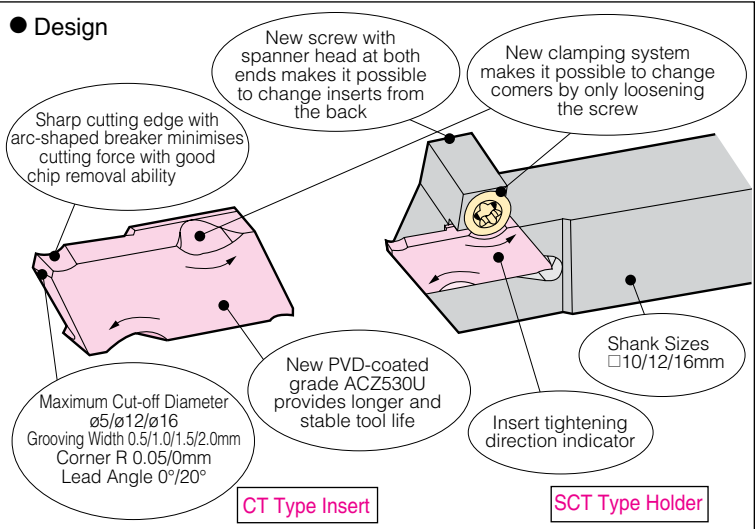
Cat. No.	Stock	Dimensions (mm)						Applicable Insert	Fig.	Screw	Spanner
		h	b	L ₁	f	h ₁	L ₂				
SCT R1010	●	10	10	120	10	10	15	CT R05○○○○(-NB) CT R12○○○○(-NB)	1	BFTX0410T8L	TRX08
SCT R1212	●	12	12	120	12	12	15				
SCT R1616	●	16	16	120	16	16	15	CT R16○○○○(-NB)	2		
SCT R1010-16	●	10	10	120	10	10	18				
SCT R1212-16	●	12	12	120	12	12	18		1		
SCT R1616-16	●	16	16	120	16	16	18				

Holders (Left Hand)

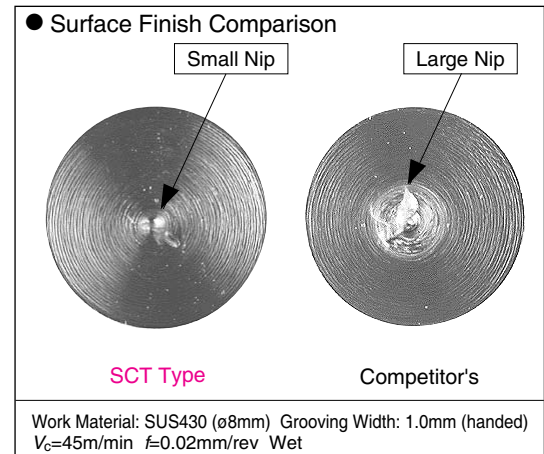
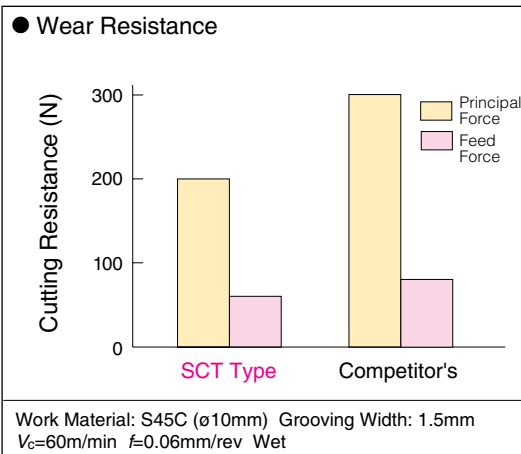
Cat. No.	Stock	Dimensions (mm)						Applicable Insert	Fig.	Screw	Spanner
		h	b	L ₁	f	h ₁	L ₂				
SCT L1010	●	10	10	120	10	10	15	CT L05○○○○(-NB) CT L12○○○○(-NB)	1	BFTX0410T8R	TRX08
SCT L1212	●	12	12	120	12	12	15				
SCT L1616	●	16	16	120	16	16	15	CT L16○○○○(-NB)	2		
SCT L1010-16	●	10	10	120	10	10	18				
SCT L1212-16	●	12	12	120	12	12	18		1		
SCT L1616-16	●	16	16	120	16	16	18				

Characteristics

- **New clamping system**
New clamping system makes it possible to change corners by only loosening the screw from the back.
- **High quality surface finish**
Excellent chip removal with good surface finish even at the centre of the end face.
- **Stable and long tool life**
PVD-coated grade AC530U provides stability and longer tool life.



Comparison Test



■ Insert and Holder Variations (Figures below show inserts with chipbreaker)

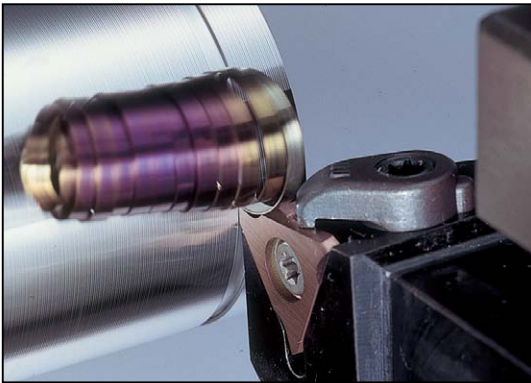
Holder Style	SCTR			SCTL		
Insert	CTROOR	CTROON	CTROOL	CTLOOR	CTLOON	CTLOOL
Orientation						
Insert Shape and Dimensions						

■ Inserts (For Right-handed Holders)

Cat. No.	Coated Carbide			Max. Cut-off Diameter (mm)	Dimensions (mm)				Chipbreaker	Applicable Toolholder			
	AC530U				w	r _ε	ℓ	s					
	R	N	L										
CTR 050505 R/N/L	●	●	●	5	0.5	19	7	Yes	SCT R1010 SCT R1212 SCT R1616				
CTR 050500 R/N/L	●	●	●	5	0								
CTR 121005 R/N/L	●	●	●	12	1.0								
CTR 121505 R/N/L	●	●	●	12	1.5								
CTR 122005 R/N/L	●	●	●	12	2.0								
CTR 121000 R/N/L	●	●	●	12	1.0								
CTR 121500 R/N/L	●	●	●	12	1.5								
CTR 122000 R/N/L	●	●	●	12	2.0								
CTR 161005 R/N/L	●	●	●	16	1.0					23.1	8.3	Yes	SCT R1010-16 SCT R1212-16 SCT R1616-16
CTR 161505 R/N/L	●	●	●	16	1.5								
CTR 162005 R/N/L	●	●	●	16	2.0								
CTR 161000 R/N/L	●	●	●	16	1.0								
CTR 161500 R/N/L	●	●	●	16	1.5								
CTR 162000 R/N/L	●	●	●	16	2.0								
CTR 050500 R/N/L-NB	●	●	●	5	0.5	19	7	No	SCT R1010 SCT R1212 SCT R1616				
CTR 121000 R/N/L-NB	●	●	●	12	1.0								
CTR 121500 R/N/L-NB	●	●	●	12	1.5								
CTR 122000 R/N/L-NB	●	●	●	12	2.0								
CTR 161000 R/N/L-NB	●	●	●	16	1.0					23.1	8.3	No	SCT R1010-16 SCT R1212-16 SCT R1616-16
CTR 161500 R/N/L-NB	●	●	●	16	1.5								
CTR 162000 R/N/L-NB	●	●	●	16	2.0								

■ Inserts (For Left-handed Holders)

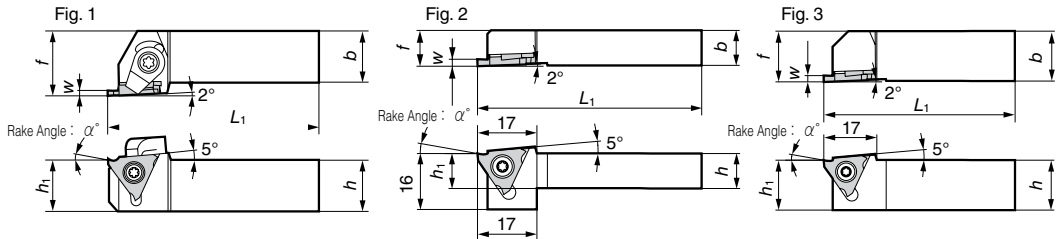
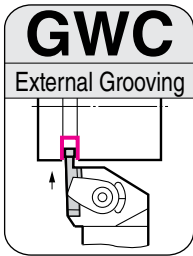
Cat. No.	Coated Carbide			Max. Cut-off Diameter (mm)	Dimensions (mm)				Chipbreaker	Applicable Toolholder			
	AC530U				w	r _ε	ℓ	s					
	R	N	L										
CTL 050505 R/N/L	●	●	●	5	0.5	19	7	Yes	SCT L1010 SCT L1212 SCT L1616				
CTL 050500 R/N/L	●	●	●	5	0								
CTL 121005 R/N/L	●	●	●	12	1.0								
CTL 121505 R/N/L	●	●	●	12	1.5								
CTL 122005 R/N/L	●	●	●	12	2.0								
CTL 121000 R/N/L	●	●	●	12	1.0								
CTL 121500 R/N/L	●	●	●	12	1.5								
CTL 122000 R/N/L	●	●	●	12	2.0								
CTL 161005 R/N/L	●	●	●	16	1.0					23.1	8.3	Yes	SCT L1010-16 SCT L1212-16 SCT L1616-16
CTL 161505 R/N/L	●	●	●	16	1.5								
CTL 162005 R/N/L	●	●	●	16	2.0								
CTL 161000 R/N/L	●	●	●	16	1.0								
CTL 161500 R/N/L	●	●	●	16	1.5								
CTL 162000 R/N/L	●	●	●	16	2.0								
CTL 050500 R/N/L-NB	●	●	●	5	0.5	19	7	No	SCT L1010 SCT L1212 SCT L1616				
CTL 121000 R/N/L-NB	●	●	●	12	1.0								
CTL 121500 R/N/L-NB	●	●	●	12	1.5								
CTL 122000 R/N/L-NB	●	●	●	12	2.0								
CTL 161000 R/N/L-NB	●	●	●	16	1.0					23.1	8.3	No	SCT L1010-16 SCT L1212-16 SCT L1616-16
CTL 161500 R/N/L-NB	●	●	●	16	1.5								
CTL 162000 R/N/L-NB	●	●	●	16	2.0								



Characteristics of GWC Series

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

External Shallow Grooves



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

■ Spare Parts

■ Holders

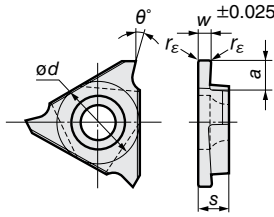
Right handed holders are applicable with right handed inserts.

Cat. No.	Stock		Dimensions (mm)					Fig.	Grooving Width (mm) <i>w</i>	Max. Grooving Depth (mm)	* Group No.	Spare Parts					
	R	L	<i>h</i>	<i>b</i>	<i>L</i> ₁	<i>f</i>	<i>h</i> ₁					Screw	Recommended Tightening Torque (N·m)	Spanner	Clamp	Double Screw	Spanner
GWC R/L1010-3	●	●	10	10	125	10	10	2	0.33 to 2.80	0.8 to 2.5	①						
GWC R/L1212-3	●	●	12	12	125	12	12	2	0.33 to 2.80	0.8 to 2.5	①	BFTX0409N	3.4	TRX15	—	—	—
GWC R/L1616-3	●	●	16	16	125	16	16	3	0.33 to 2.80	0.8 to 2.5	①						
GWC R/L2020-3	●	●	20	20	125	25	20	1	0.33 to 2.80	0.8 to 2.5	①						
GWC R/L2525-3	●	●	25	25	150	30	25	1	0.33 to 2.80	0.8 to 2.5	①	BFTX0409N	3.4	TRX15	CCM6B L/R	WB6-20T/TL	LT20
GWC R/L2020-15	●	●	20	20	125	25	20	1	1.00 to 1.45	2.0	②						
GWC R/L2020-25	●	●	20	20	125	25	20	1	1.50 to 2.30	3.5	③						
GWC R/L2020-35	●	●	20	20	125	25	20	1	2.50 to 4.80	5.0	④						
GWC R/L2525-15	●	●	25	25	150	30	25	1	1.00 to 1.45	2.0	②						
GWC R/L2525-25	●	●	25	25	150	30	25	1	1.50 to 2.30	3.5	③	BFTX0511N	5.0	TRX20	CCM8U L/R	WB8-22T/TL	LT27
GWC R/L2525-35	●	●	25	25	150	30	25	1	2.50 to 4.80	5.0	④						

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

TGA Type

Insert



Above figures show right hand tools.

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

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

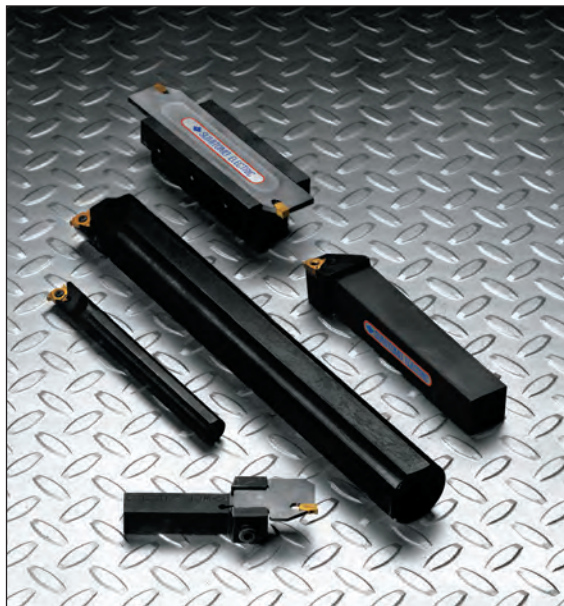
Cat. No. <small>(Add E to the end of the Cat. No. for T1500A and T1200A grades)</small>	Coated Carbide		Carbide		Coated Cermet		Cermet				SUMIBORON		SUMIDIA	Grooving Width (mm) w	Max. Grooving Depth (mm)		Dimensions (mm)			* Group No.		
	AC530U	H1	T3000Z	T1500A	T1200A	BN2000	BN250	DA2200	W	External	Internal	a	re		od	s						
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	W	External	Internal	a	re		od	s
TGA R/L3033(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	0.33	0.8	0.5	1.0	0.05	9.525	3.18	①
TGA R/L3050(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	0.50	1.2	0.8	1.4				
TGA R/L3075(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	0.75	2.0	1.5	2.5	0.1 0.2 for T1500A/ T1200A	9.525	3.18	①
TGA R/L3095(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	0.95							
TGA R/L3100(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.00							
TGA R/L3110(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.10							
TGA R/L3125(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.25							
TGA R/L3135(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.35							
TGA R/L3145(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.45							
TGA R/L3150(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.50							
TGA R/L3165(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.65							
TGA R/L3175(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.75							
TGA R/L3185(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.85							
TGA R/L3200(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.00	2.5	2.0	3.0	0.1 0.2 for T1500A/ T1200A	9.525	3.18	①
TGA R/L3220(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.20							
TGA R/L3230(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.30							
TGA R/L3250(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.50							
TGA R/L3265(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.65							
TGA R/L3270(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.70							
TGA R/L3280(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.80							
TGA R/L4125(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	1.25							
TGA R/L4145(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.45							
TGA R/L4150(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	1.50	3.5	2.5	3.9	0.2 *2	12.70	4.76	③
TGA R/L4165(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.65							
TGA R/L4175(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.75							
TGA R/L4185(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	1.85							
TGA R/L4200(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	2.00							
TGA R/L4220(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.20							
TGA R/L4230(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.30							
TGA R/L4250(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	2.50							
TGA R/L4265(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.65	5.0 *1	2.5	5.4 *1	0.3 *2	12.70	4.76	④
TGA R/L4270(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.70							
TGA R/L4280(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	2.80							
TGA R/L4300(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	3.00							
TGA R/L4320(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	3.20							
TGA R/L4330(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	3.30							
TGA R/L4350(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	3.50							
TGA R/L4370(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	3.70							
TGA R/L4390(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	3.90							
TGA R/L4400(E)	●	●	●	●	●	●	●	●	▲	▲	●	▲	●	—	4.00							
TGA R/L4410(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.10							
TGA R/L4420(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.20							
TGA R/L4430(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.30							
TGA R/L4440(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.40							
TGA R/L4450(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.50							
TGA R/L4480(E)	●	●	●	●	●	●	●	●	▲	▲	—	—	—	—	4.80							

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

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

THREADING, GROOVING, & CUT-OFF HOLDERS

Pages 239-264



Threading,
Grooving,
&
Cut-Off Holders

THREADING, GROOVING, & CUT-OFF

PAGES

GND Series.....	240-253
SumiTurnB-Groove.....	254
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SumiCut-Off™ Steel Toolholders.....	261
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■ SUMINOTCH GROOVING TOOLHOLDERS

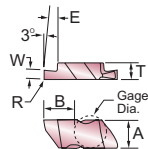
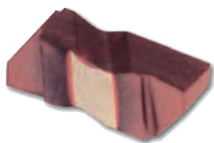
SS Series														
				A	B	C	D	E	F	H				
Sumitomo Cat. No.	Sumitomo Cat. No.	Gage Insert												
Right Hand	Left Hand	R.H.	L.H.											
SSR-82V	SSL-82V	SG-2R	SG-2L	.500	.500	3.500	.140	1.25	.750	.50	TF-74	TF-75	S-310	
SSR-102B	SSL-102B	SG-2R	SG-2L	.625	.625	4.500	.140	1.25	1.000	.50	TF-74	TF-75	S-310	
SSR-122B	SSL-122B	SG-2R	SG-2L	.750	.750	4.500	.140	1.25	1.000	.50	TF-74	TF-75	S-310	
SSR-162C	SSL-162C	SG-2R	SG-2L	1.000	1.000	5.000	.140	1.25	1.250	.50	TF-74	TF-75	S-310	
SSR-123A	SSL-123A	SG-3R	SG-3L	.750	.750	4.000	.210	1.25	1.000	.50	TF72	TF-73	S-412	
SSR-123B	SSL-123B	SG-3R	SG-3L	.750	.750	4.500	.210	1.25	1.000	.50	TF72	TF-73	S-412	
SSR-163C	SSL-163C	SG-3R	SG-3L	1.000	1.000	5.000	.210	1.25	1.250	.50	TF72	TF-73	S-412	
SSR-163D	SSL-163D	SG-3R	SG-3L	1.000	1.000	6.000	.210	1.25	1.250	.50	TF72	TF-73	S-412	
SSR-853D	SSL-853D	SG-3R	SG-3L	1.000	1.250	6.000	.210	1.25	1.500	.50	TF72	TF-73	S-412	
SSR-203D	SSL-203D	SG-3R	SG-3L	1.250	1.250	6.000	.210	1.25	1.500	.50	TF72	TF-73	S-412	

■ SUMINOTCH GROOVING BORING BARS

A-SE Series											
				D	C	F	Min. Bore	A			
Sumitomo Cat. No.	Sumitomo Cat. No.	Gage Insert									
Right Hand	Left Hand	R.H.	L.H.								
A08-SER2	A08-SEL2	SG-2R	SG-2L	.500	8.000	.437	0.730	1/4-18 NPT	TF-74	TF-75	S-310
A10-SER2	A10-SEL2	SG-2R	SG-2L	.625	10.000	.500	1.000	1/4-18 NPT	TF-74	TF-75	S-310
A12-SER2	A12-SEL2	SG-2R	SG-2L	.750	10.000	.562	1.125	1/4-18 NPT	TF-74	TF-75	S-310
A16-SER2	A16-SEL2	SG-2R	SG-2L	1.000	12.000	.688	1.375	1/4-18 NPT	TF-74	TF-75	S-310
A16-SER3	A16-SEL3	SG-3R	SG-3L	1.000	12.000	.688	1.375	1/4-18 NPT	TF72	TF-73	S-412
A20-SER3	A20-SEL3	SG-3R	SG-3L	1.250	14.000	.875	1.750	1/4-18 NPT	TF72	TF-73	S-412
A24-SER3	A24-SEL3	SG-3R	SG-3L	1.500	14.000	1.000	2.000	1/4-18 NPT	TF72	TF-73	S-412

Note: Right-hand boring bars use left-hand inserts. Left-hand boring bars use right-hand inserts.





- USA Stocked Item
- ★ Worldwide Warehouse Item
- ▲ USA Limited Availability Item

SUMINOTCH GROOVING INSERTS

Left				Dimensions (in)							Right			
SG	Coated	CBN		W ±.001	R	E ±.001	T	A	B	Gage Dia.	SG	Coated	CBN	
	EH520V	BN250	BN350									EH520V	BN250	BN350
SG-2031L	●			.031	.002/.005	.050					SG-2031R	●		
SG-2041L	●			.041	.002/.005	.050					SG-2041R	●		
SG-2047L	●			.047	.002/.005	.050					SG-2047R	●		
SG-2058L	●			.058	.005/.010	.050	.150	.219	.2700	.1875	SG-2058R	●		
SG-2062L	●			.062	.005/.010	.110					SG-2062R	●		
SG-2094L	●			.094	.005/.010	.110					SG-2094R	●		
SG-2125L	●			.125	.005/.010	.110					SG-2125R	●		
SG-3047L	●			.047	.005/.010	.120					SG-3047R	●	●	●
SG-3062L	●	●	●	.062	.005/.010	.120					SG-3062R	●	●	●
SG-3072L	●			.072	.005/.010	.120					SG-3072R	●		
SG-3088L	●			.088	.005/.010	.180					SG-3088R	●		
SG-3094L	●	●	●	.094	.005/.010	.180					SG-3094R	●	●	●
SG-3097L	●			.097	.005/.010	.180					SG-3097R	●		
SG-3105L	●			.105	.005/.010	.180					SG-3105R	●		
SG-3110L	●			.110	.005/.010	.180	.195	.344	.4050	.3750	SG-3110R	●		
SG-3122L	●			.122	.005/.010	.180					SG-3122R	●		
SG-3125L	●	●	●	.125	.005/.010	.180					SG-3125R	●	●	●
SG-3142L	●			.142	.005/.010	.180					SG-3142R	●		
SG-3156L	●			.156	.005/.010	.180					SG-3156R	●		
SG-3178L	●			.178	.005/.010	.180					SG-3178R	●		
SG-3185L	●			.185	.020/.025	.180					SG-3185R	●		
SG-3189L	●			.189	.020/.025	.180					SG-3189R	●		●

Left		Dimensions (in)							Right	
SG-CB	Coated	W ±.001	R	E ±.001	T	A	B	Gage Dia.	SG-CB	Coated
	EH520V									EH520V
SG-2047L-CB	●	.047	.002/.005	.050					SG-2047R-CB	●
SG-2062L-CB	●	.062	.005/.010	.110					SG-2062R-CB	●
SG-2078L-CB	●	.078	.005/.010	.110	.150	.219	.2700	.1875	SG-2078R-CB	●
SG-2094L-CB	●	.094	.005/.010	.110					SG-2094R-CB	●
SG-2125L-CB	●	.125	.005/.010	.110					SG-2125R-CB	●
SG-3047L-CB	●	.047	.005/.010	.075					SG-3047R-CB	●
SG-3062L-CB	●	.062	.005/.010	.094					SG-3062R-CB	●
SG-3072L-CB	●	.072	.005/.010	.094					SG-3072R-CB	●
SG-3078L-CB	●	.088	.005/.010	.094					SG-3078R-CB	●
SG-3088L-CB	●	.094	.005/.010	.150	.195	.344	.4050	.3750	SG-3088R-CB	●
SG-3094L-CB	●	.097	.005/.010	.150					SG-3094R-CB	●
SG-3125L-CB	●	.185	.020/.025	.150					SG-3125R-CB	●
SG-3189L-CB	●	.189	.020/.025	.150					SG-3189R-CB	●

RECOMMENDED RUNNING CONDITIONS

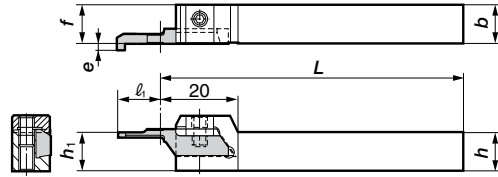
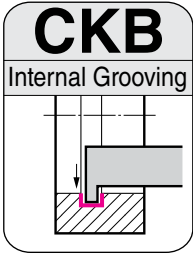
Material		Speed (SFM)	Feed Rate (in/rev)
Steels	free-machining carbon alloys	450-750	
	plain carbon steels	400-700	
	alloy steels 190-330HB	400-700	.004 - .012
	alloy steels 330-450HB	350-600	
Stainless Steels	martensitic/ferritic stainless steel	250-650	
	austenitic stainless steel	175-700	.004 - .009
Cast Iron	gray cast iron 190-330HB	400-700	
	gray cast iron 330-450HB	350-600	.004 - .015
	alloy/ductile irons	250-650	
High Temperature Alloys	high temp alloys 200-260HB	60-250	
	high temp alloys 260-450HB	30-175	.003 - .008
	titanium alloys Ti 6Al-4V	90-250	
Non-Ferrous Materials	free-machining aluminum alloys	600-2500	
	copper/zinc/brass	300-900	.004 - .012
	non-metallics	350-1200	



Threading, Grooving, & Cut-Off Holders

CKB/SGIT Type

Internal Grooving



Please refer to the insert table below for dimensions of e and l_1 .

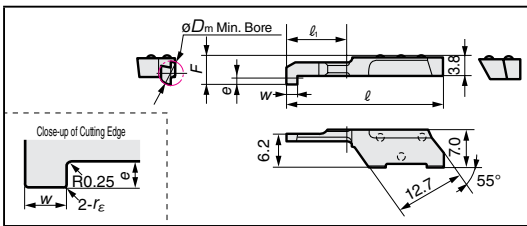
■ Holders

Cat. No.	Stock	Dimensions (mm)					Clamp	Double Screw	Spanner
		h	b	L	f	h_1			
CKB R1010-16	●	10	10	100	10	10	CKBW16	WB4-8	LH020
CKB R1212-16	●	12	12	125	12	12			
CKB R1616-16	●	16	16	125	16	16			
CKB R2020-16	●	20	20	125	20	20			
CKB R2525-16	●	25	25	150	25	25			

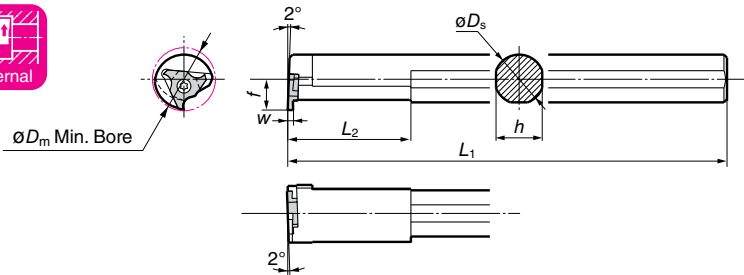
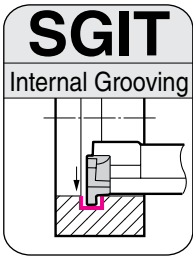
■ Spare Parts



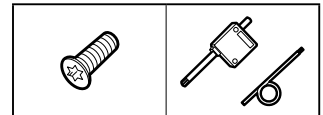
■ Inserts



Cat. No.	Coated Carbide	Min. Bore	Grooving Width (mm)	Dimensions (mm)					
	ACZ310			ϕD_m	w	F	e	r_E	l
KBMG R0411-05	●	4.0	1.00	4.90	1.1	0.05	28.5	11	
KBMG R0411-10	●	4.0	2.00	4.90	1.1	0.10	28.5	11	
KBMG R0511-05	●	5.0	1.00	5.10	1.3	0.05	28.5	11	
KBMG R0511-10	●	5.0	2.00	5.10	1.3	0.10	28.5	11	



■ Spare Parts



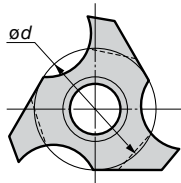
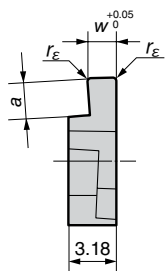
■ Holders

Cat. No.	Stock	Dimensions (mm)					Min. Bore (mm)	Grooving Width (mm)	Max. Grooving Depth (mm)	Applicable Insert	Screw	Spanner
		ϕD_s	h	L_1	f	L_2						
SGIT R08	●	8	7.0	125	5.0	20	10.0	0.50 to 2.00	0.8*	GITL3000	BFTX02506NS	RT08
SGIT R10	●	10	9.0	150	6.0	25	12.0	0.8*				
SGIT R12	●	12	11.0	180	7.0	30	14.0	1.00 to 2.00	1.8	GITL5000	BFTX0307NS	RT10
SGIT R14	●	14	13.0	180	8.0	35	16.0	1.8				
SGIT R16	●	16	15.0	200	10.0	40	20.0	1.50 to 2.00	2.8			
SGIT R20	●	20	19.0	200	12.0	40	25.0	2.8	2.8	GITL6000		

*Maximum grooving depth is 0.5mm when GITL3050 is set.

■ Inserts

Cat. No.	Coated Carbide	Dimensions (mm)				Applicable Holder
	ACZ150	w	a	r_E	ϕd	
GIT L3050	●	0.50	1.2	0.05	5.56	SGIT R08 SGIT R10
GIT L3065	●	0.65	1.2	0.05	5.56	
GIT L3075	●	0.75	1.2	0.05	5.56	
GIT L3100	●	1.00	1.2	0.05	5.56	
GIT L3125	●	1.25	1.2	0.20	5.56	
GIT L3145	●	1.45	1.2	0.20	5.56	
GIT L3150	●	1.50	1.2	0.05	5.56	
GIT L3200	●	2.00	1.2	0.10	5.56	
GIT L5100	●	1.00	2.2	0.05	7.94	SGIT R12 SGIT R14
GIT L5145	●	1.45	2.2	0.20	7.94	
GIT L5150	●	1.50	2.2	0.05	7.94	
GIT L5175	●	1.75	2.2	0.20	7.94	
GIT L5200	●	2.00	2.2	0.10	7.94	
GIT L6150	●	1.50	3.2	0.20	9.525	SGIT R16 SGIT R20
GIT L6175	●	1.75	3.2	0.20	9.525	
GIT L6200	●	2.00	3.2	0.20	9.525	



SOLID CARBIDE ENDMILLS

Pages 347-385



Endmill Series

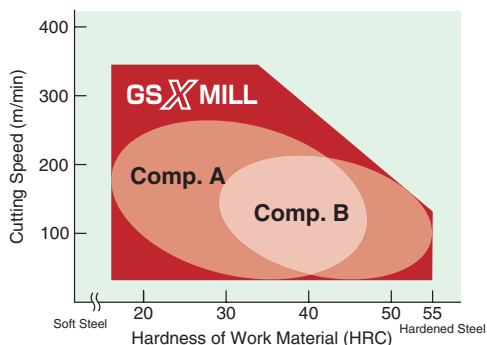
SOLID CARBIDE ENDMILLS	PAGES
GSX Introduction	348-352
GSX Square Inch	353-364
GSX Ballnose Inch	365
GSX Square Metric	366-373, 375-380
GSX Ballnose Metric	374
GSXVL	381-383
ASM	384
SNB	385



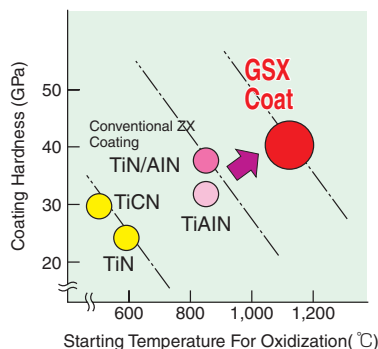
Features & Benefits

- Wide variation of three flute types and four flute lengths enable use in a wide variety of applications.
- Fine carbide substrate provides high traverse rupture strength and excellent thermal shock resistance improving reliability in wet cutting applications.
- **GSX Coat** provides improved reliability and longer tool life.
- Large rake angle and unique flute design improve sharpness and chip evacuation.
- Corner edge with gash land improves cutting edge strength.
- **Sharper edge S** type and **fracture resistant C** type added to the 2D size series.

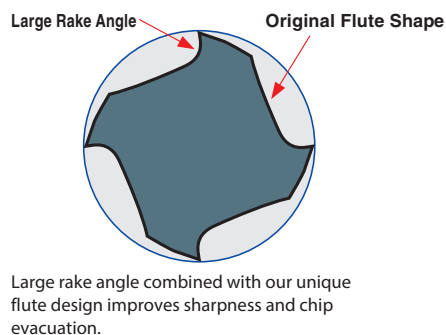
Wear Resistance



Thermal Resistance



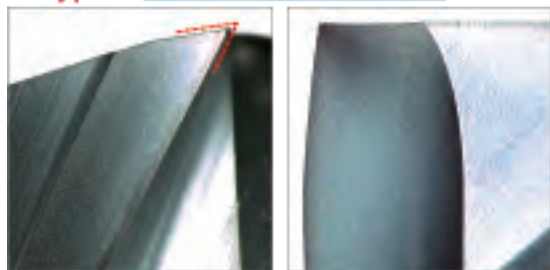
Improved Chip Evacuation



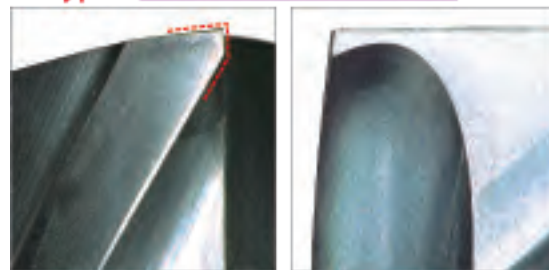
2 cutting edge designs expand machining applications

Sharper edge S type and fracture resistant C type added to the 2D size series.

S Type Sharp Corner, Sharper Edge Design

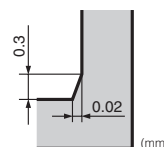


C Type Gash Land, Fracture Resistant Design



Note: When using endmills with gash land, some material remains as shown on the right. If you need sharp corners, use the S Type.

Ex.: Corner on a $\phi 10$ mm hole



Application Range

◎ : Best ○ : Good Blank : Not recommended

	P				H			M	S	K	N				
	General Structure Rolled Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Hardened Steel			Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
					45 to 55 HRC	55 to 60 HRC	60 HRC								
◎	◎	◎	◎	◎	◎			◎	○	○	○				

*1 : GSXSLT30000C is recommended for 50 HRC or less.

Recommended Milling Examples

Application	Surface Milling		Groove Milling		Groove Finishing	
Form						
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
S Type		◎		○*2		◎
C Type	◎	○	◎	◎	◎	○

S Type is best for removing inside corners

*2 : Use with small depth of cut.



Product Range

Application	No. of Teeth	Flute Length					
		1.5D	2D		3D		4D
		C Type	S Type	C Type	S Type	C Type	C Type
General Purpose	2	GSX20000C-1.5D φ1.0 to φ20.0mm	GSX20000S-2D φ0.5 to φ20.0mm	GSX20000C-2D φ0.5 to φ25.0mm	GSX20000S-3D φ0.5 to φ20.0mm	GSX20000C-3D φ1.0 to φ20.0mm	GSX20000C-4D φ1.0 to φ20.0mm
	3	GSX30000C-1.5D φ1.0 to φ20.0mm		GSX30000C-2D φ1.0 to φ20.0mm			
	4	GSX40000C-1.5D φ1.0 to φ20.0mm	GSX40000S-2D φ1.0 to φ20.0mm	GSX40000C-2D φ1.0 to φ25.0mm	GSX40000S-3D φ1.0 to φ20.0mm	GSX40000C-3D φ1.0 to φ20.0mm	GSX40000C-4D φ1.0 to φ20.0mm

*1 C type end cutting edge (gash land) GS MILL Series

High Precision

Diametrical tolerance held to 2/3 of the previous type. Also features reduced variation and does not require tool diameter correction when replacing tools.

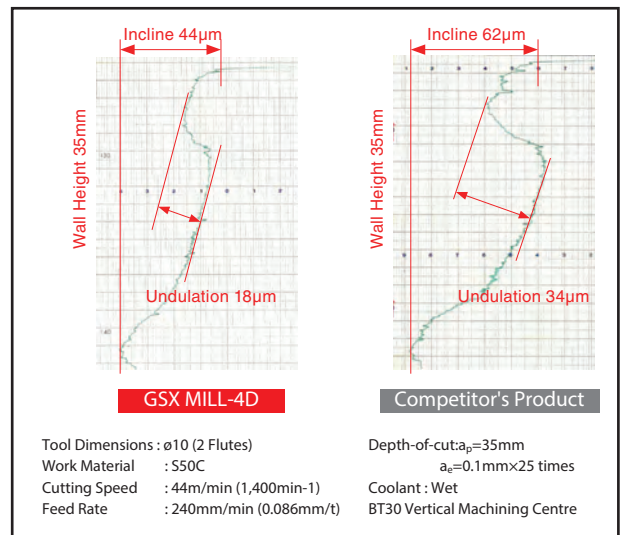
Multi-Purpose

Optimized flute design of slotted 3 flute (short) type reduces cutting resistance.

1. Allows drilling, slot milling and other continuous (compound) applications.
2. Perfect for use on thin walls and small machining centres.



Long, High Rigidity Flutes



Application Examples

Carbon Steel Grooving with GSX20000C

GSX MILL		Gash land for stronger cutting edge.
		Breakage

Tool Dimension	φ6 (2 Flutes)
Work Material	S50C
Cutting Speed	87m/min (4615min ⁻¹)
Feed Rate	553mm/min (0.06mm/t)
Depth-of-cut	a _p =3mm
	a _e =6mm
Coolant	Dry
Vertical Machining Centre	BT50

Cast Iron Grooving with GSX20000C

GSX MILL		GSX Coat for improved wear resistance.
		High Wear

Tool Dimension	φ10 (2 Flutes)
Work Material	Equivalent to FDC600
Cutting Speed	66m/min (2100min ⁻¹)
Feed Rate	302mm/min (0.072mm/t)
Depth-of-cut	a _p =5mm×5 passes
	a _e =10mm
Coolant	Dry
Vertical Machining Centre	BT40

Stainless Steel Machining with GSX20000C

GSX MILL		Improved reliability even under wet machining.
		Coating peel off

Tool Dimension	φ10 (2 Flutes)
Work Material	SUS304
Cutting Speed	50m/min (1591min ⁻¹)
Feed Rate	127mm/min (0.04mm/t)
Depth-of-cut	a _p =10mm
	a _e =0.5mm
Coolant	Wet
Vertical Machining Centre	BT50

Surface Milling S50C with GSX20000S

GSX MILL		S type delivers optimum cutting performance.
		Chipping

Tool Dimension	φ6 (2 Flutes)
Work Material	S50C
Cutting Speed	87m/min (4615min ⁻¹)
Feed Rate	553mm/min (0.06mm/t)
Depth-of-cut	a _p =10mm
	a _e =0.3mm
Coolant	Dry
Vertical Machining Centre	BT50

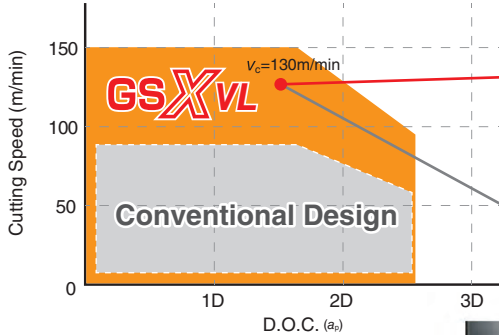




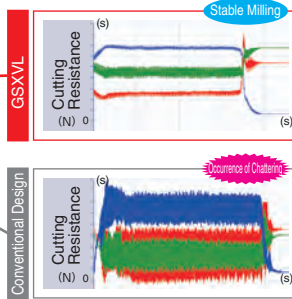
Drastically improved resistance to chattering and breakage

Optimization of irregular pitch and lead design drastically improve vibration and breakage resistance. Achieving high-speed, high efficiency milling by lowering cutting resistance.

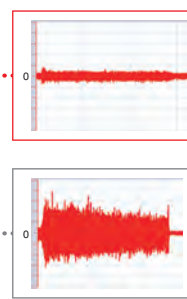
Cutting Area



Cutting Resistance



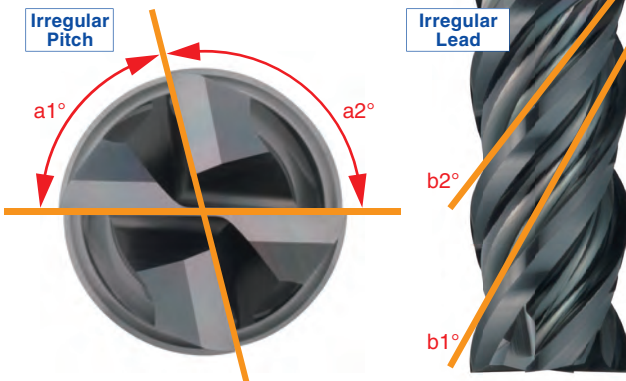
Vibration Data



● Side Milling

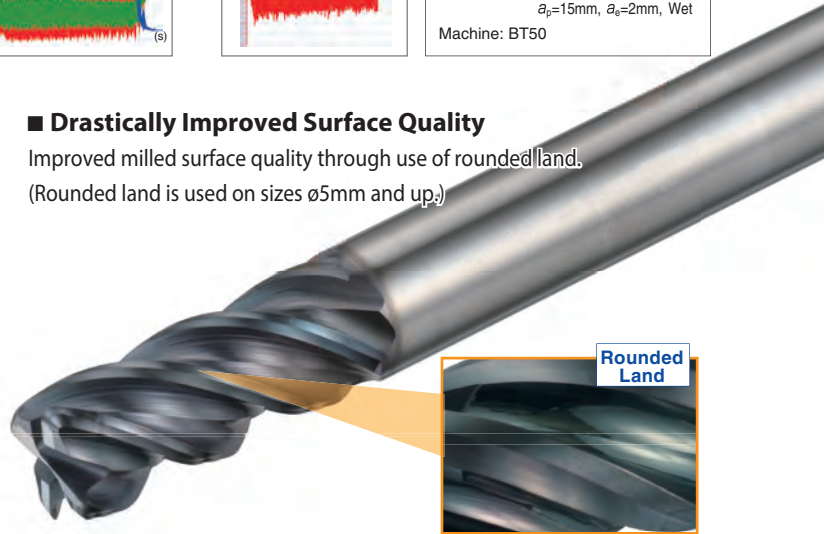
Work Material: S50C Tool diameter: $\phi 10$
Cutting Conditions: $n=4,100\text{min}^{-1}$
 $V_f=1,450\text{mm/min}$
 $a_p=15\text{mm}$, $a_e=2\text{mm}$, Wet
Machine: BT50

Irregular Pitch and Irregular Lead



Drastically Improved Surface Quality

Improved milled surface quality through use of rounded land.
(Rounded land is used on sizes $\phi 5\text{mm}$ and up.)

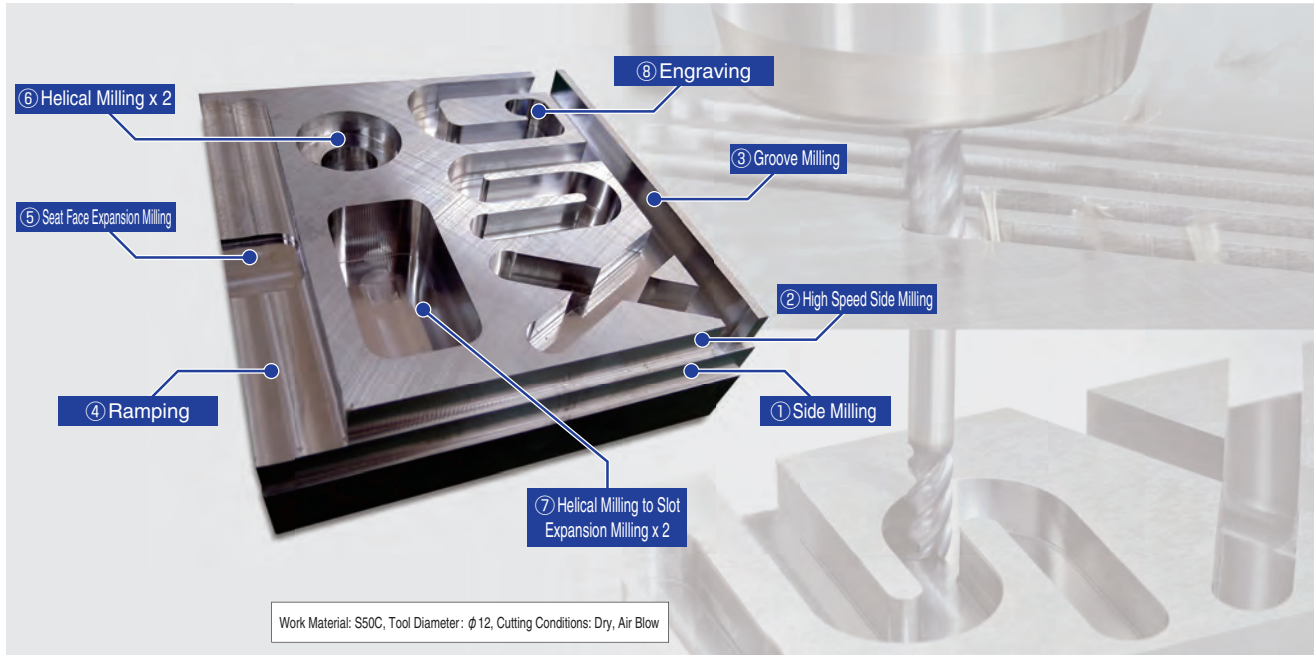


Application Examples (Work Material: SUS304)

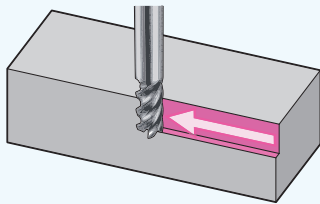
Tool	Cutting Conditions	Surface Finish Quality	Enlarged Machined Surface	Surface Roughness
GSXVL Anti-vibration Type	$n=1,200\text{min}^{-1}$ $V_f=300\text{mm/min}$ $a_p=18\text{mm}$, $a_e=1.2\text{mm}$ Wet	◎ Good		◎ Ideal for finishing
Irregular Pitch Irregular Lead	$n=1,300\text{min}^{-1}$ $V_f=630\text{mm/min}$ $a_p=18\text{mm}$, $a_e=1.2\text{mm}$ Wet	◎ Surface is rough but without chattering		○ Ideal for (high feed) roughing
Competitor's Product	$n=1,200\text{min}^{-1}$ $V_f=300\text{mm/min}$ $a_p=18\text{mm}$, $a_e=1.2\text{mm}$ Wet	✗ Occurrence of chattering		✗ NG due to chattering



Application Examples

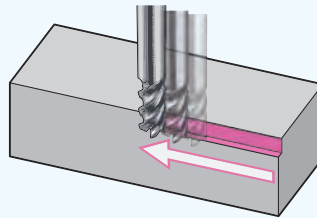


① Side Milling



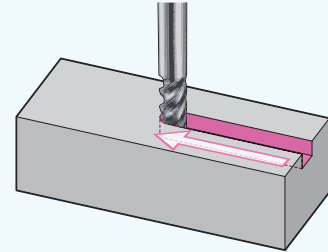
Cutting Conditions: $v_c=102\text{m/min}$ ($n=4,100\text{min}^{-1}$)
 $v_f=1,080\text{mm/min}$ (0.1mm/t)
 $a_p=24\text{mm}$, $a_e=2.0\text{mm}$

② High Speed Side Milling



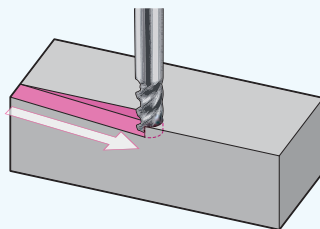
Cutting Conditions: $v_c=151\text{m/min}$ ($n=4,000\text{min}^{-1}$)
 $v_f=4,800\text{mm/min}$ (0.3mm/t)
 $a_p=12\text{mm}$, $a_e=2.0\text{mm}$

③ Groove Milling



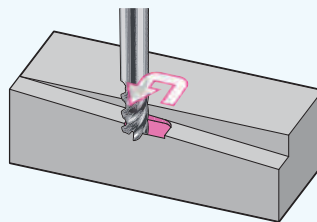
Cutting Conditions: $v_c=90\text{m/min}$ ($n=2,400\text{min}^{-1}$)
 $v_f=960\text{mm/min}$ (0.1mm/t)
 $a_p=12\text{mm}$

④ Ramping



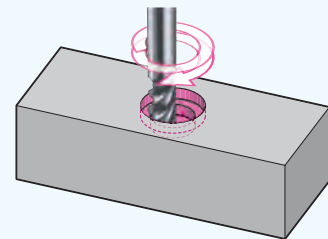
Cutting Conditions: $v_c=90\text{m/min}$ ($n=2,400\text{min}^{-1}$)
 $v_f=480\text{mm/min}$ (0.05mm/t)
 Ramp Angle 5°

⑤ Seat Face Expansion Milling



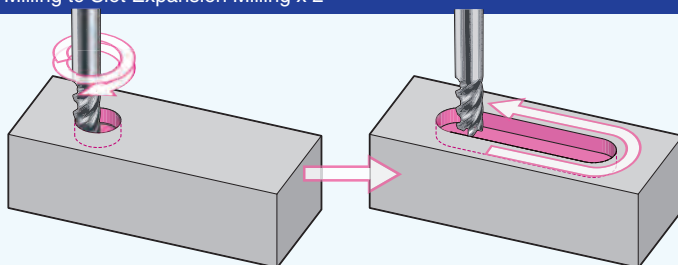
Cutting Conditions: $v_c=90\text{m/min}$ ($n=2,400\text{min}^{-1}$)
 $v_f=960\text{mm/min}$ (0.1mm/t)

⑥ Helical Milling x 2



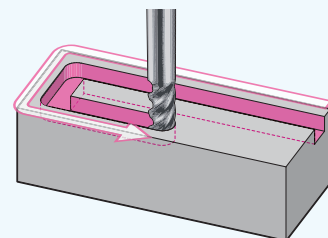
Cutting Conditions: $v_c=90\text{m/min}$ ($n=2,400\text{min}^{-1}$)
 $v_f=480\text{mm/min}$ (0.05mm/t)
 Ramp Angle 3°

⑦ Helical Milling to Slot Expansion Milling x 2



Cutting Conditions: $v_c=90\text{m/min}$ ($n=2,400\text{min}^{-1}$)
 [Helical] $v_f=480\text{mm/min}$ (0.05mm/t) [Slot Expansion] $v_f=672\text{mm/min}$ (0.07mm/t) [Finishing] $v_f=1,920\text{mm/min}$ (0.2mm/t)
 Ramp Angle 3°
 $a_p=24\text{mm}$, $a_e=0.1\text{mm}$

⑧ Engraving



Cutting Conditions: $v_c=79\text{m/min}$ ($n=2,100\text{min}^{-1}$)
 $v_f=588\text{mm/min}$ (0.07mm/t)
 $a_p=12\text{mm}$



Recommended Milling Examples

Application	Radius Milling		Copy Milling		Pocket Milling	
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
Ballnose Type	⊙	⊙	⊙	⊙	⊙	⊙

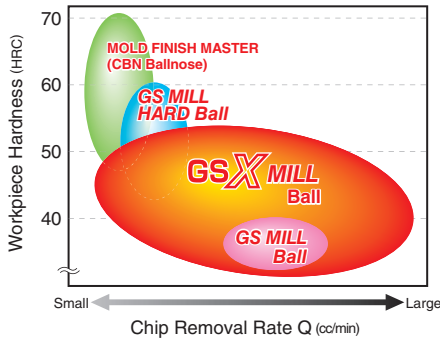
Diameter



Improved Thermal Resistance and Wear Resistance

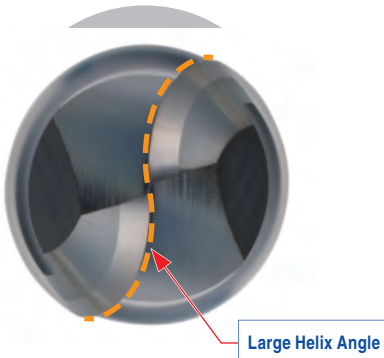
New coating combined with a fine-grained carbide substrate exhibit better thermal and wear resistance.

Application Range



Reduced Cutting Resistance

Large helix angle on cutting edge reduces cutting resistance.

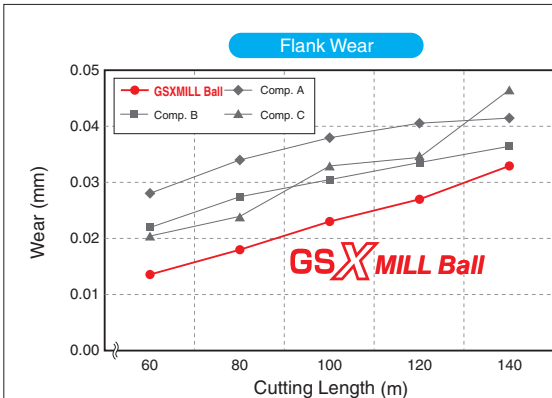


Improved Chip Evacuation

Unique pocket design and expanded pocket area promotes better chip evacuation.



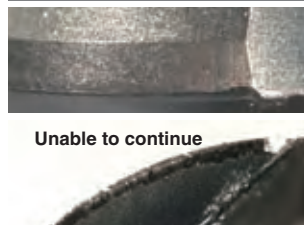
Application Examples



GSX Ball (Cutting Length 140 m)



Conventional Tool (Cutting Length 80 m)

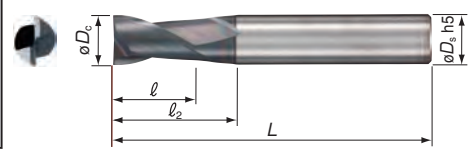


Work Material: SKD61 (50HRC)
Tool Dimensions: R3 (2 Flutes)
Cutting Conditions: $V_c=179\text{m/min}$ ($n=9,500\text{min}^{-1}$), $V_f=2,250\text{mm/min}$ ($f_z=0.12\text{mm/t}$)
 $a_p=0.2$ to 1.0mm , $a_e=0.3\text{mm}$, Wet
Equipment: Vertical Machining Centre BT40



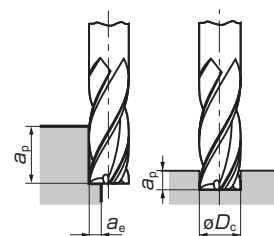
GSX End Mill-INCH 1.5D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX204C-1.5D	○	2	1.5D	0.0625	1.588	0.1250	0.0938	0.1331	1.500	-
GSX206C-1.5D	○	2	1.5D	0.0938	2.381	0.1250	0.1406	0.1800	1.500	-
GSX208C-1.5D	○	2	1.5D	0.1250	3.175	0.1250	0.1875	-	2.000	-
GSX210C-1.5D	○	2	1.5D	0.1563	3.969	0.1875	0.2344	0.2934	2.000	-
GSX212C-1.5D	○	2	1.5D	0.1875	4.763	0.1875	0.2813	-	2.000	-
GSX214C-1.5D	○	2	1.5D	0.2188	5.558	0.2500	0.3282	0.407	2.000	-
GSX216C-1.5D	○	2	1.5D	0.2500	6.350	0.2500	0.3750	-	2.000	-
GSX218C-1.5D	○	2	1.5D	0.2813	7.144	0.3125	0.4219	0.501	2.500	-
GSX220C-1.5D	○	2	1.5D	0.3125	7.938	0.3125	0.4688	-	2.500	-
GSX224C-1.5D	○	2	1.5D	0.3750	9.525	0.3750	0.5625	-	3.000	-
GSX228C-1.5D	○	2	1.5D	0.4375	11.113	0.4375	0.6563	-	3.000	-
GSX232C-1.5D	○	2	1.5D	0.5000	12.700	0.5000	0.7500	-	3.000	-
GSX236C-1.5D	○	2	1.5D	0.5625	14.288	0.5625	0.8438	-	3.500	-
GSX240C-1.5D	○	2	1.5D	0.6250	15.875	0.6250	0.9375	-	3.500	-
GSX244C-1.5D	○	2	1.5D	0.6875	17.463	0.6875	1.0313	-	4.000	-
GSX248C-1.5D	○	2	1.5D	0.7500	19.050	0.7500	1.1250	-	4.000	-
GSX256C-1.5D	○	2	1.5D	0.8750	22.225	0.8750	1.3125	-	4.000	-
GSX264C-1.5D	○	2	1.5D	1.0000	25.400	1.0000	1.5000	-	4.000	-



Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 2 04 C - 1.5D

1 Series Code
2 # of Flutes (4/64 = 0.0625")
3 Diameter in 64ths
4 Cutting Edge (S: Sharp Edge, C: Gash Land)
5 Cutting Edge Length

Recommended Cutting Conditions

Side Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	19,600	9.84	19,600	9.84	19,600	9.84	18,300	7.09	12,700	3.94	9,000	2.36	11,000	2.76	9,000	1.97
< 0.078	11,200	13.39	11,200	13.39	11,200	13.39	10,500	9.45	7,300	5.12	5,300	3.15	6,400	3.54	5,300	2.76
< 0.156	6,400	18.11	6,400	18.11	6,400	18.11	6,000	12.60	4,200	7.09	3,000	4.33	3,600	4.72	3,000	3.54
< 0.236	4,600	22.05	4,600	22.05	4,600	22.05	4,300	15.75	3,000	8.27	2,200	5.12	2,700	5.51	2,200	3.94
< 0.315	3,400	22.05	3,400	22.05	3,400	22.05	3,200	15.75	2,200	8.27	1,600	5.12	2,000	5.51	1,600	3.94
< 0.393	2,800	22.05	2,800	22.05	2,800	22.05	2,600	15.75	1,800	8.27	1,300	5.12	1,600	5.51	1,300	3.94
< 0.472	2,300	22.05	2,300	22.05	2,300	22.05	2,200	15.75	1,500	8.27	1,100	5.12	1,300	5.51	1,100	3.94
< 0.630	1,700	17.72	1,700	17.72	1,700	17.72	1,600	12.60	1,100	7.09	800	3.94	1,000	4.33	800	3.35
< 0.787	1,350	14.96	1,350	14.96	1,350	14.96	1,300	11.02	900	6.30	650	3.54	800	3.94	650	2.95
Standard Depth-of-cut a_p	1.5D _c											1.0D _c				
a_e	0.05D _c											0.02D _c				

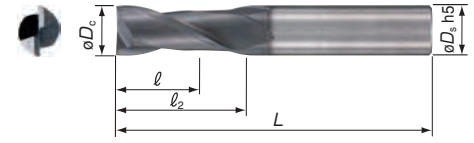
Groove Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	19,600	7.87	19,600	9.84	19,600	9.84	18,300	7.09	12,700	3.94	9,000	2.36	11,000	1.97	4,500	0.79
< 0.078	11,200	10.63	11,200	13.39	11,200	13.39	10,500	9.45	7,300	5.12	5,300	3.15	6,400	2.56	2,650	0.98
< 0.156	6,400	14.57	6,400	18.11	6,400	18.11	6,000	12.60	4,200	7.09	3,000	4.33	3,600	3.15	1,650	1.38
< 0.236	4,600	17.72	4,600	22.05	4,600	22.05	4,300	15.75	3,000	8.27	2,200	5.12	2,700	3.94	1,100	1.57
< 0.315	3,400	17.72	3,400	22.05	3,400	22.05	3,200	15.75	2,200	8.27	1,600	5.12	2,000	3.94	800	1.57
< 0.393	2,800	17.72	2,800	22.05	2,800	22.05	2,600	15.75	1,800	8.27	1,300	5.12	1,600	3.94	650	1.57
< 0.472	2,300	17.72	2,300	22.05	2,300	22.05	2,200	15.75	1,500	8.27	1,100	5.12	1,300	3.94	500	1.57
< 0.630	1,700	14.17	1,700	17.72	1,700	17.72	1,600	12.60	1,100	7.09	800	3.94	1,000	3.15	400	1.38
< 0.787	1,350	11.81	1,350	14.96	1,350	14.96	1,300	11.02	900	6.30	650	3.54	800	2.76	320	1.18
Standard Depth-of-cut a_p	0.2D _c		0.5D _c				0.2D _c		0.05D _c		0.2D _c		0.2D _c			



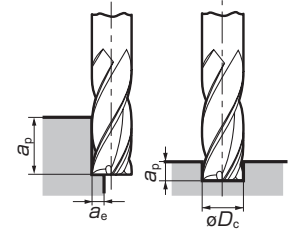
GSX End Mill-INCH 2D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) l	Neck Length (inch) l_2	OAL (inch) L	R (inch)
GSX204C-2D	○	2	2D	0.0625	1.588	0.1250	0.1250	0.1644	1.500	-
GSX206C-2D	○	2	2D	0.0938	2.381	0.1250	0.1875	0.2269	1.500	-
GSX208C-2D	○	2	2D	0.1250	3.175	0.1250	0.2500	-	2.000	-
GSX210C-2D	○	2	2D	0.1563	3.969	0.1875	0.3125	0.3716	2.000	-
GSX212C-2D	○	2	2D	0.1875	4.763	0.1875	0.3750	-	2.000	-
GSX214C-2D	○	2	2D	0.2188	5.558	0.2500	0.4376	0.516	2.000	-
GSX216C-2D	○	2	2D	0.2500	6.350	0.2500	0.5000	-	2.000	-
GSX218C-2D	○	2	2D	0.2813	7.145	0.3125	0.5626	0.641	2.500	-
GSX220C-2D	○	2	2D	0.3125	7.938	0.3125	0.6250	-	2.500	-
GSX224C-2D	○	2	2D	0.3750	9.525	0.3750	0.7500	-	3.000	-
GSX228C-2D	○	2	2D	0.4375	11.113	0.4375	0.8750	-	3.000	-
GSX232C-2D	○	2	2D	0.5000	12.700	0.5000	1.0000	-	3.000	-
GSX236C-2D	○	2	2D	0.5625	14.288	0.5625	1.1250	-	3.500	-
GSX240C-2D	○	2	2D	0.6250	15.875	0.6250	1.2500	-	3.500	-
GSX244C-2D	○	2	2D	0.6875	17.463	0.6875	1.3750	-	4.000	-
GSX248C-2D	○	2	2D	0.7500	19.050	0.7500	1.5000	-	4.000	-
GSX256C-2D	○	2	2D	0.8750	22.225	0.8750	1.7500	-	4.000	-
GSX264C-2D	○	2	2D	1.0000	25.400	1.0000	2.0000	-	4.000	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSX MILL Series Only)

GSX 2 04 C - 2D

1 Series Code 2 # of Flutes 3 Diameter in 64ths (4/64 = 0.0625") 4 Cutting Edge 5 Cutting Length

S: Sharp Edge C: Gash Land

○ - Items Available 1st Quarter 2015

Recommended Cutting Conditions

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	19,600	9.84	19,600	9.84	19,600	9.84	18,300	7.09	12,700	3.94	9,000	2.36	11,000	2.76	9,000	1.97
< 0.078	11,200	13.39	11,200	13.39	11,200	13.39	10,500	9.45	7,300	5.12	5,300	3.15	6,400	3.54	5,300	2.76
< 0.156	6,400	18.11	6,400	18.11	6,400	18.11	6,000	12.60	4,200	7.09	3,000	4.33	3,600	4.72	3,000	3.54
< 0.236	4,600	22.05	4,600	22.05	4,600	22.05	4,300	15.75	3,000	8.27	2,200	5.12	2,700	5.51	2,200	3.94
< 0.315	3,400	22.05	3,400	22.05	3,400	22.05	3,200	15.75	2,200	8.27	1,600	5.12	2,000	5.51	1,600	3.94
< 0.393	2,800	22.05	2,800	22.05	2,800	22.05	2,600	15.75	1,800	8.27	1,300	5.12	1,600	5.51	1,300	3.94
< 0.472	2,300	22.05	2,300	22.05	2,300	22.05	2,200	15.75	1,500	8.27	1,100	5.12	1,300	5.51	1,100	3.94
< 0.630	1,700	17.72	1,700	17.72	1,700	17.72	1,600	12.60	1,100	7.09	800	3.94	1,000	4.33	800	3.35
< 0.787	1,350	14.96	1,350	14.96	1,350	14.96	1,300	11.02	900	6.30	650	3.54	800	3.94	650	2.95
< 1.000	1,000	11.81	1,000	11.81	1,000	11.81	1,000	8.66	700	4.72	500	2.76	640	3.15	500	2.36
Standard Depth-of-cut	$1.5D_c$										$1.0D_c$					
	$0.05D_c$										$0.02D_c$					

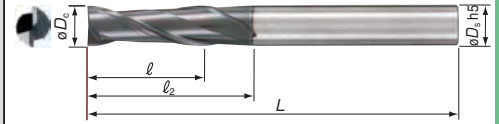
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	19,600	7.87	19,600	9.84	19,600	9.84	18,300	7.09	12,700	3.94	9,000	2.36	11,000	1.97	4,500	0.79
< 0.078	11,200	10.63	11,200	13.39	11,200	13.39	10,500	9.45	7,300	5.12	5,300	3.15	6,400	2.56	2,650	0.98
< 0.156	6,400	14.57	6,400	18.11	6,400	18.11	6,000	12.60	4,200	7.09	3,000	4.33	3,600	3.15	1,500	1.38
< 0.236	4,600	17.72	4,600	22.05	4,600	22.05	4,300	15.75	3,000	8.27	2,200	5.12	2,700	3.94	1,100	1.57
< 0.315	3,400	17.72	3,400	22.05	3,400	22.05	3,200	15.75	2,200	8.27	1,600	5.12	2,000	3.94	800	1.57
< 0.393	2,800	17.72	2,800	22.05	2,800	22.05	2,600	15.75	1,800	8.27	1,300	5.12	1,600	3.94	650	1.57
< 0.472	2,300	17.72	2,300	22.05	2,300	22.05	2,200	15.75	1,500	8.27	1,100	5.12	1,300	3.94	500	1.57
< 0.630	1,700	14.17	1,700	17.72	1,700	17.72	1,600	12.60	1,100	7.09	800	3.94	1,000	3.15	400	1.38
< 0.787	1,350	11.81	1,350	14.96	1,350	14.96	1,300	11.02	900	6.30	650	3.54	800	2.76	320	1.18
< 1.000	1,000	9.45	1,000	11.81	1,000	11.81	1,000	8.66	700	4.72	500	2.76	640	2.17	250	0.98
Standard Depth-of-cut	$0.2D_c$		$0.5D_c$				$0.2D_c$		$0.05D_c$		$0.2D_c$					



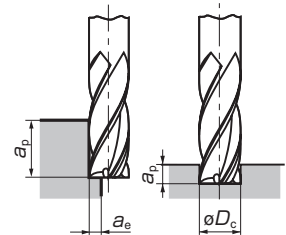
GSX End Mill-INCH 3D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX204C-3D	○	2	3D	0.0625	1.588	0.1250	0.1875	0.2269	1.500	-
GSX206C-3D	○	2	3D	0.0938	2.381	0.1250	0.2813	0.3206	1.500	-
GSX208C-3D	○	2	3D	0.1250	3.175	0.1250	0.3750	-	2.000	-
GSX210C-3D	○	2	3D	0.1563	3.969	0.1875	0.4688	0.5278	2.000	-
GSX212C-3D	○	2	3D	0.1875	4.763	0.1875	0.5625	-	2.000	-
GSX214C-3D	○	2	3D	0.2188	5.558	0.2500	0.6564	0.735	2.000	-
GSX216C-3D	○	2	3D	0.2500	6.350	0.2500	0.7500	-	2.000	-
GSX218C-3D	○	2	3D	0.2813	7.145	0.3125	0.8439	0.923	3.000	-
GSX220C-3D	○	2	3D	0.3125	7.938	0.3125	0.9375	-	3.000	-
GSX224C-3D	○	2	3D	0.3750	9.525	0.3750	1.1250	-	3.500	-
GSX228C-3D	○	2	3D	0.4375	11.113	0.4375	1.3125	-	3.500	-
GSX232C-3D	○	2	3D	0.5000	12.700	0.5000	1.5000	-	3.500	-
GSX236C-3D	○	2	3D	0.5625	14.288	0.5625	1.6875	-	4.500	-
GSX240C-3D	○	2	3D	0.6250	15.875	0.6250	1.8750	-	4.500	-
GSX244C-3D	○	2	3D	0.6875	17.463	0.6875	2.0625	-	4.500	-
GSX248C-3D	○	2	3D	0.7500	19.050	0.7500	2.2500	-	5.000	-
GSX256C-3D	○	2	3D	0.8750	22.225	0.8750	2.6250	-	5.000	-
GSX264C-3D	○	2	3D	1.0000	25.400	1.0000	3.0000	-	5.500	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chatter may occur in early milling stages, dissipating after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 2 04 C - 3D

Series Code: 1
of Flutes: 2
Diameter in 64ths: 4 (4/64 = 0.0625")
Cutting Edge Length: 04
Cutting Length: 3D
S: Sharp Edge
C: Gash Land

Recommended Cutting Conditions

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	16,600	7.48	16,600	7.48	16,600	7.48	15,500	5.51	10,500	2.76	7,500	1.77	9,400	1.97	7,500	1.38
< 0.078	9,500	9.84	9,500	9.84	9,500	9.84	9,000	7.87	6,200	4.72	4,500	2.36	5,200	2.76	4,500	1.97
< 0.156	5,200	12.99	5,200	12.99	5,200	12.99	4,800	7.87	3,400	5.91	2,250	2.95	2,600	3.54	2,250	2.56
< 0.236	3,500	14.17	3,500	14.17	3,500	14.17	3,200	9.84	2,550	6.69	1,500	3.54	1,700	3.94	1,500	3.15
< 0.315	2,600	12.60	2,600	12.60	2,600	12.60	2,400	9.45	1,900	6.69	1,100	3.54	1,300	3.94	1,100	3.15
< 0.393	2,100	11.81	2,100	11.81	2,100	11.81	1,900	9.06	1,500	6.69	900	3.54	1,000	3.94	900	3.15
< 0.472	1,750	11.02	1,750	11.02	1,750	11.02	1,600	9.06	1,250	6.69	750	3.54	850	3.94	750	3.15
< 0.630	1,300	9.45	1,300	9.45	1,300	9.45	1,200	7.87	950	5.91	550	2.95	650	3.35	550	2.56
< 0.787	1,050	8.66	1,050	8.66	1,050	8.66	950	7.09	750	5.51	450	2.76	500	2.95	450	2.36
Standard Depth-of-cut	a_p Below $\phi 3 : 0.05D_c$ $\phi 3$ and above : $0.1D_c$								a_p $2.0D_c$ $0.02D_c$							

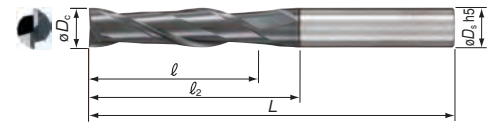
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	16,600	2.76	16,600	3.15	16,600	3.15	15,500	1.97	10,500	1.97	7,500	1.38	9,400	1.18	3,750	0.39
< 0.078	9,500	3.15	9,500	3.94	9,500	3.94	9,000	3.54	6,200	2.36	4,500	1.77	5,200	1.57	2,250	0.59
< 0.156	5,200	4.72	5,200	5.91	5,200	5.91	4,800	4.72	3,400	3.15	2,200	1.97	2,600	1.97	1,250	0.79
< 0.236	3,500	5.51	3,500	6.69	3,500	6.69	3,200	5.12	2,550	3.94	1,500	1.97	1,700	2.36	950	0.98
< 0.315	2,600	5.51	2,600	6.30	2,600	6.30	2,400	5.12	1,900	3.94	1,100	1.97	1,300	2.36	700	0.98
< 0.393	2,100	5.12	2,100	5.91	2,100	5.91	1,900	4.72	1,500	3.54	900	1.97	1,000	2.36	550	0.98
< 0.472	1,750	5.12	1,750	5.91	1,750	5.91	1,600	4.72	1,250	3.54	750	1.97	850	2.36	450	0.98
< 0.630	1,300	4.33	1,300	5.12	1,300	5.12	1,200	4.33	950	3.15	550	1.77	650	1.97	350	0.79
< 0.787	1,050	3.94	1,050	4.72	1,050	4.72	950	3.94	750	2.76	450	1.57	500	1.57	280	0.59
Standard Depth-of-cut	a_p $0.1D_c$		a_p $0.2D_c$				a_p $0.05D_c$				a_p $0.1D_c$					



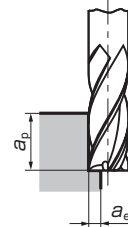
GSX End Mill-INCH 4D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX204C-4D	○	2	4D	0.0625	1.588	0.1250	0.2500	0.2894	1.500	-
GSX206C-4D	○	2	4D	0.0938	2.381	0.1250	0.3750	0.4144	2.000	-
GSX208C-4D	○	2	4D	0.1250	3.175	0.1250	0.5000	-	2.000	-
GSX210C-4D	○	2	4D	0.1563	3.969	0.1875	0.6250	0.6841	2.000	-
GSX212C-4D	○	2	4D	0.1875	4.763	0.1875	0.7500	-	2.500	-
GSX214C-4D	○	2	4D	0.2188	5.558	0.2500	0.8752	0.954	2.500	-
GSX216C-4D	○	2	4D	0.2500	6.350	0.2500	1.0000	-	2.500	-
GSX218C-4D	○	2	4D	0.2813	7.145	0.3125	1.1252	1.204	3.000	-
GSX220C-4D	○	2	4D	0.3125	7.938	0.3125	1.2500	-	3.000	-
GSX224C-4D	○	2	4D	0.3750	9.525	0.3750	1.5000	-	3.500	-
GSX228C-4D	○	2	4D	0.4375	11.113	0.4375	1.7500	-	4.000	-
GSX232C-4D	○	2	4D	0.5000	12.700	0.5000	2.0000	-	4.000	-
GSX236C-4D	○	2	4D	0.5625	14.288	0.5625	2.2500	-	5.000	-
GSX240C-4D	○	2	4D	0.6250	15.875	0.6250	2.5000	-	5.000	-
GSX244C-4D	○	2	4D	0.6875	17.463	0.6875	2.7500	-	5.000	-
GSX248C-4D	○	2	4D	0.7500	19.050	0.7500	3.0000	-	5.500	-
GSX256C-4D	○	2	4D	0.8750	22.225	0.8750	3.5000	-	5.500	-
GSX264C-4D	○	2	4D	1.0000	25.400	1.0000	4.0000	-	6.000	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rear cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for grooving.
7. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 2 04 C - 4D

1 2 3 4 5

Series # of Diameter Cutting Cutting

Code Flutes in 64ths Edge Length

(4/64 = 0.0625") S: Sharp Edge C: Gash Land

Recommended Cutting Conditions

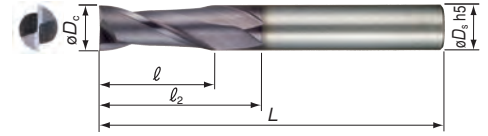
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy			
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)		
< 0.039	9,000	5.12	9,000	5.12	9,000	5.12	7,000	3.74	6,500	1.97	4,500	1.18	5,400	1.57	4,500	0.98		
< 0.078	4,500	7.09	4,500	7.09	4,500	7.09	3,500	4.72	3,200	2.76	2,300	1.57	2,700	1.97	2,300	1.38		
< 0.156	2,250	9.45	2,250	9.45	2,250	9.45	1,750	6.30	1,600	3.74	1,200	2.36	1,350	2.56	1,200	1.57		
< 0.236	1,500	11.81	1,500	11.81	1,500	11.81	1,150	6.69	1,050	4.33	800	2.76	900	2.76	800	1.97		
< 0.315	1,100	10.24	1,100	10.24	1,100	10.24	850	6.69	800	4.33	600	2.76	660	2.76	600	1.97		
< 0.393	900	9.84	900	9.84	900	9.84	700	6.30	650	4.33	460	2.76	540	2.76	460	1.97		
< 0.472	750	9.45	750	9.45	750	9.45	580	6.30	520	4.33	400	2.76	450	2.76	400	1.97		
< 0.630	550	7.87	550	7.87	550	7.87	440	5.51	400	3.74	300	2.17	330	2.36	300	1.77		
< 0.787	450	7.09	450	7.09	450	7.09	350	4.72	320	3.35	240	1.77	270	1.97	240	1.57		
Standard Depth-of-cut	a_p		a_p		a_p		a_p		a_p		a_p		a_p		a_p			
	a_e		a_e		a_e		a_e		a_e		a_e		a_e		a_e			
	0.08D _c						3.5D _c						3.0D _c					
													0.04D _c					



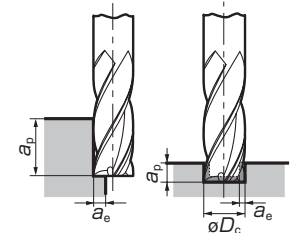
GSX End Mill-INCH 2D Sharp Edge

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) l	Neck Length (inch) l_2	OAL (inch) L	R (inch)
GSX204S-2D	○	2	2D	0.0625	1.588	0.1250	0.1250	0.1644	1.500	-
GSX206S-2D	○	2	2D	0.0938	2.381	0.1250	0.1875	0.2269	1.500	-
GSX208S-2D	○	2	2D	0.1250	3.175	0.1250	0.2500	-	2.000	-
GSX210S-2D	○	2	2D	0.1563	3.969	0.1875	0.3125	0.3716	2.000	-
GSX212S-2D	○	2	2D	0.1875	4.763	0.1875	0.3750	-	2.000	-
GSX214S-2D	○	2	2D	0.2188	5.558	0.2500	0.4376	0.516	2.000	-
GSX216S-2D	○	2	2D	0.2500	6.350	0.2500	0.5000	-	2.000	-
GSX218S-2D	○	2	2D	0.2813	7.145	0.3125	0.5626	0.641	2.500	-
GSX220S-2D	○	2	2D	0.3125	7.938	0.3125	0.6250	-	2.500	-
GSX224S-2D	○	2	2D	0.3750	9.525	0.3750	0.7500	-	3.000	-
GSX228S-2D	○	2	2D	0.4375	11.113	0.4375	0.8750	-	3.000	-
GSX232S-2D	○	2	2D	0.5000	12.700	0.5000	1.0000	-	3.000	-
GSX236S-2D	○	2	2D	0.5625	14.288	0.5625	1.1250	-	3.500	-
GSX240S-2D	○	2	2D	0.6250	15.875	0.6250	1.2500	-	3.500	-
GSX244S-2D	○	2	2D	0.6875	17.463	0.6875	1.3750	-	4.000	-
GSX248S-2D	○	2	2D	0.7500	19.050	0.7500	1.5000	-	4.000	-
GSX256S-2D	○	2	2D	0.8750	22.225	0.8750	1.7500	-	4.000	-
GSX264S-2D	○	2	2D	1.0000	25.400	1.0000	2.0000	-	4.000	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for groove milling.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSX MILL Series Only)

○ - Items Available 1st Quarter 2015

GSX 2 04 S - 2D

1 Series Code
2 # of Flutes
3 Diameter in 64ths (4/64 = 0.0625")
4 Cutting Edge
5 Cutting Edge Length
S: Sharp Edge
C: Gash Land

Recommended Cutting Conditions

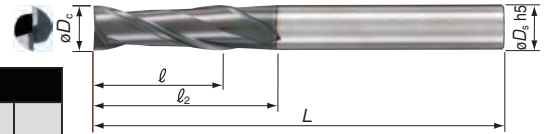
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	22,000	14.17	22,000	14.17	22,000	14.17	19,000	8.66	13,000	5.51	9,500	3.54	11,300	3.54	9,500	2.56
< 0.078	11,500	17.32	11,500	17.32	11,500	17.32	11,000	11.42	7,500	7.09	5,400	4.33	6,500	4.72	5,400	3.35
< 0.156	6,000	22.05	6,000	22.05	6,000	22.05	5,800	14.57	4,000	9.06	2,900	5.91	3,400	6.30	2,900	3.94
< 0.236	4,200	23.62	4,200	23.62	4,200	23.62	4,000	15.75	2,700	9.45	2,000	6.30	2,400	6.69	2,000	4.72
< 0.315	3,000	23.62	3,000	23.62	3,000	23.62	2,800	15.75	2,000	9.45	1,450	6.30	1,800	6.69	1,450	4.72
< 0.393	2,500	23.62	2,500	23.62	2,500	23.62	2,350	15.75	1,600	9.45	1,200	6.30	1,450	6.69	1,200	4.72
< 0.472	2,100	23.62	2,100	23.62	2,100	23.62	2,000	15.75	1,350	9.45	1,000	6.30	1,200	6.69	1,000	4.72
< 0.630	1,500	19.69	1,500	19.69	1,500	19.69	1,450	12.60	1,000	8.27	750	5.12	900	5.51	750	3.54
< 0.787	1,200	18.11	1,200	18.11	1,200	18.11	1,150	11.42	800	7.87	600	4.33	700	4.72	600	2.95
Standard Depth-of-cut a_p a_e	2.0D _c										0.01D _c					
	0.03D _c										0.01D _c					

Groove Finishing

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	22,000	14.17	22,000	14.17	22,000	14.17	19,000	8.66	13,000	5.51	9,500	3.54	11,300	3.54	9,500	2.56
< 0.078	11,500	17.32	11,500	17.32	11,500	17.32	11,000	11.42	7,500	7.09	5,400	4.33	6,500	4.72	5,400	3.35
< 0.156	6,000	22.05	6,000	22.05	6,000	22.05	5,800	14.57	4,000	9.06	2,900	5.91	3,400	6.30	2,900	3.94
< 0.236	4,200	23.62	4,200	23.62	4,200	23.62	4,000	15.75	2,700	9.45	2,000	6.30	2,400	6.69	2,000	4.72
< 0.315	3,000	23.62	3,000	23.62	3,000	23.62	2,800	15.75	2,000	9.45	1,450	6.30	1,800	6.69	1,450	4.72
< 0.393	2,500	23.62	2,500	23.62	2,500	23.62	2,350	15.75	1,600	9.45	1,200	6.30	1,450	6.69	1,200	4.72
< 0.472	2,100	23.62	2,100	23.62	2,100	23.62	2,000	15.75	1,350	9.45	1,000	6.30	1,200	6.69	1,000	4.72
< 0.630	1,500	19.69	1,500	19.69	1,500	19.69	1,450	12.60	1,000	8.27	750	5.12	900	5.51	750	3.54
< 0.787	1,200	18.11	1,200	18.11	1,200	18.11	1,150	11.42	800	7.87	600	4.33	700	4.72	600	2.95
Standard Depth-of-cut a_p a_e	1.5D _c															
	Below 0.02D _c															



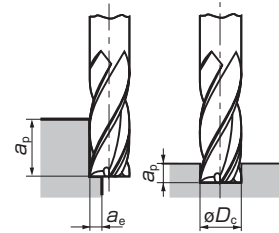


GSX End Mill-INCH 3D Sharp Edge

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX204S-3D	○	2	3D	0.0625	1.588	0.1250	0.1875	0.2269	1.500	-
GSX206S-3D	○	2	3D	0.0938	2.381	0.1250	0.2813	0.3206	1.500	-
GSX208S-3D	○	2	3D	0.1250	3.175	0.1250	0.3750	-	2.000	-
GSX210S-3D	○	2	3D	0.1563	3.969	0.1875	0.4688	0.5278	2.000	-
GSX212S-3D	○	2	3D	0.1875	4.763	0.1875	0.5625	-	2.000	-
GSX214S-3D	○	2	3D	0.2188	5.558	0.2500	0.6564	0.735	2.000	-
GSX216S-3D	○	2	3D	0.2500	6.350	0.2500	0.7500	-	2.000	-
GSX218S-3D	○	2	3D	0.2813	7.145	0.3125	0.8439	0.923	3.000	-
GSX220S-3D	○	2	3D	0.3125	7.938	0.3125	0.9375	-	3.000	-
GSX224S-3D	○	2	3D	0.3750	9.525	0.3750	1.1250	-	3.500	-
GSX228S-3D	○	2	3D	0.4375	11.113	0.4375	1.3125	-	3.500	-
GSX232S-3D	○	2	3D	0.5000	12.700	0.5000	1.5000	-	3.500	-
GSX236S-3D	○	2	3D	0.5625	14.288	0.5625	1.6875	-	4.500	-
GSX240S-3D	○	2	3D	0.6250	15.875	0.6250	1.8750	-	4.500	-
GSX244S-3D	○	2	3D	0.6875	17.463	0.6875	2.0625	-	4.500	-
GSX248S-3D	○	2	3D	0.7500	19.050	0.7500	2.2500	-	5.000	-
GSX256S-3D	○	2	3D	0.8750	22.225	0.8750	2.6250	-	5.000	-
GSX264S-3D	○	2	3D	1.0000	25.400	1.0000	3.0000	-	5.500	-

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 2 04 S - 3D

1 Series Code 2 # of Flutes 3 Diameter in 64ths (4/64 = 0.0625") 4 Cutting Edge 5 Cutting Edge Length
 S: Sharp Edge C: Gash Land

Recommended Cutting Conditions

Side Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	18,500	9.84	18,500	9.84	18,500	9.84	17,000	5.91	11,500	3.94	8,000	2.56	9,400	2.56	8,000	1.77
< 0.078	9,400	9.84	9,400	9.84	9,400	9.84	8,500	7.87	6,700	5.12	4,000	2.56	4,600	3.54	4,000	2.36
< 0.156	4,500	13.78	4,500	13.78	4,500	13.78	4,300	9.84	3,500	8.27	2,000	4.33	2,300	4.33	2,000	2.76
< 0.236	3,100	15.75	3,100	15.75	3,100	15.75	2,800	11.81	2,400	8.66	1,300	4.72	1,500	4.72	1,300	3.54
< 0.315	2,300	14.96	2,300	14.96	2,300	14.96	2,100	11.81	1,800	8.66	950	4.72	1,100	4.72	900	3.54
< 0.393	1,800	13.78	1,800	13.78	1,800	13.78	1,700	11.81	1,400	8.66	700	4.72	900	4.72	800	3.54
< 0.472	1,500	13.78	1,500	13.78	1,500	13.78	1,400	11.81	1,200	8.66	650	4.33	750	4.72	650	3.54
< 0.630	1,100	11.81	1,100	11.81	1,100	11.81	1,000	9.45	900	7.48	480	3.54	550	3.94	490	2.76
< 0.787	900	11.02	900	11.02	900	11.02	850	8.27	700	6.69	400	3.15	440	3.54	400	2.36
Standard Depth-of-cut a_p	2.5D _c										2.0D _c					
a_e	Below ø3: 0.02D _c From ø3 to below ø8: 0.05D _c ø8 and above: 0.07D _c										0.01D _c					

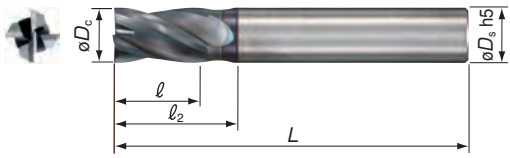
Groove Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	18,500	9.84	18,500	9.84	18,500	9.84	17,000	5.91	11,500	3.94	8,000	2.56	9,400	2.56	8,000	1.77
< 0.078	9,400	9.84	9,400	9.84	9,400	9.84	8,500	7.87	6,700	5.12	4,000	2.56	4,600	3.54	4,000	2.36
< 0.156	4,500	13.78	4,500	13.78	4,500	13.78	4,300	9.84	3,500	8.27	2,000	4.33	2,300	4.33	2,000	2.76
< 0.236	3,100	15.75	3,100	15.75	3,100	15.75	2,800	11.81	2,400	8.66	1,300	4.72	1,500	4.72	1,300	3.54
< 0.315	2,300	14.96	2,300	14.96	2,300	14.96	2,100	11.81	1,800	8.66	950	4.72	1,100	4.72	900	3.54
< 0.393	1,800	13.78	1,800	13.78	1,800	13.78	1,700	11.81	1,400	8.66	700	4.72	900	4.72	800	3.54
< 0.472	1,500	13.78	1,500	13.78	1,500	13.78	1,400	11.81	1,200	8.66	650	4.33	750	4.72	650	3.54
< 0.630	1,100	11.81	1,100	11.81	1,100	11.81	1,000	9.45	900	7.48	480	3.54	550	3.94	490	2.76
< 0.787	900	11.02	900	11.02	900	11.02	850	8.27	700	6.69	400	3.15	440	3.54	400	2.36
Standard Depth-of-cut a_p	0.02D _c Max.															



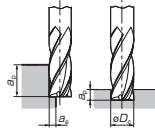
GSX Series Solid Carbide Endmills

SOLID CARBIDE ENDMILLS



Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSX Series Only)

GSX 4 04 C - 1.5D

1 Series Code
2 # of Flutes
3 Diameter in 64ths
4 Cutting Edge
5 Cutting Length

(4/64 = 0.0625")
S: Sharp Edge
C: Gash Land

GSX End Mill- INCH 1.5D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) φD _c	Diam. (mm) φD _c	Shank Diam. (inch) φD _s	Flute Length (inch) ℓ	Neck Length (inch) ℓ ₂	OAL (inch) L	R (inch)
GSX404C-1.5D	○	4	1.5D	0.0625	1.588	0.1250	0.0938	0.1331	1.500	-
GSX406C-1.5D	○	4	1.5D	0.0938	2.381	0.1250	0.1406	0.1800	1.500	-
GSX408C-1.5D	○	4	1.5D	0.1250	3.175	0.1250	0.1875	-	2.000	-
GSX410C-1.5D	○	4	1.5D	0.1563	3.969	0.1875	0.2344	0.2934	2.000	-
GSX412C-1.5D	○	4	1.5D	0.1875	4.763	0.1875	0.2813	-	2.000	-
GSX414C-1.5D	○	4	1.5D	0.2188	5.558	0.2500	0.3282	0.407	2.000	-
GSX416C-1.5D	○	4	1.5D	0.2500	6.350	0.2500	0.3750	-	2.000	-
GSX418C-1.5D	○	4	1.5D	0.2813	7.145	0.3125	0.4220	0.501	2.500	-
GSX420C-1.5D	○	4	1.5D	0.3125	7.938	0.3125	0.4688	-	2.500	-
GSX424C-1.5D	○	4	1.5D	0.3750	9.525	0.3750	0.5625	-	3.000	-
GSX428C-1.5D	○	4	1.5D	0.4375	11.113	0.4375	0.6563	-	3.000	-
GSX432C-1.5D	○	4	1.5D	0.5000	12.700	0.5000	0.7500	-	3.000	-
GSX436C-1.5D	○	4	1.5D	0.5625	14.288	0.5625	0.8438	-	3.500	-
GSX440C-1.5D	○	4	1.5D	0.6250	15.875	0.6250	0.9375	-	3.500	-
GSX444C-1.5D	○	4	1.5D	0.6875	17.463	0.6875	1.0313	-	4.000	-
GSX448C-1.5D	○	4	1.5D	0.7500	19.050	0.7500	1.1250	-	4.000	-
GSX456C-1.5D	○	4	1.5D	0.8750	22.225	0.8750	1.3125	-	4.000	-
GSX464C-1.5D	○	4	1.5D	1.0000	25.400	1.0000	1.5000	-	4.000	-

○ - Items Available 1st Quarter 2015

Recommended Cutting Conditions

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (in)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
< 0.039	24,000	18.50	24,000	18.50	24,000	18.50	21,000	11.42	14,500	7.09	10,500	4.72	12,600	6.30	10,500	3.35
< 0.078	12,800	22.44	12,800	22.44	12,800	22.44	12,000	14.96	8,300	9.06	6,000	5.91	7,200	6.30	6,000	4.33
< 0.156	6,800	28.74	6,800	28.74	6,800	28.74	6,400	19.29	4,400	11.81	3,200	7.87	3,800	8.27	3,200	5.12
< 0.236	4,600	30.71	4,600	30.71	4,600	30.71	4,300	20.47	3,000	12.60	2,200	8.27	2,650	8.66	2,200	5.91
< 0.315	3,400	30.71	3,400	30.71	3,400	30.71	3,200	20.47	2,200	12.60	1,600	8.27	2,000	8.66	1,600	5.91
< 0.393	2,800	30.71	2,800	30.71	2,800	30.71	2,600	20.47	1,800	12.60	1,300	8.27	1,500	8.66	1,300	5.91
< 0.472	2,300	30.71	2,300	30.71	2,300	30.71	2,200	20.47	1,500	12.60	1,100	8.27	1,300	8.66	1,100	5.91
< 0.630	1,700	25.59	1,700	25.59	1,700	25.59	1,600	16.54	1,100	11.02	800	6.69	1,000	7.09	800	4.72
< 0.787	1,350	23.62	1,350	23.62	1,350	23.62	1,300	14.96	900	10.24	650	5.91	800	6.30	650	3.94
Standard Depth-of-cut	a _p	1.5D _c										1.0D _c				
a _e	0.05D _c										0.02D _c					

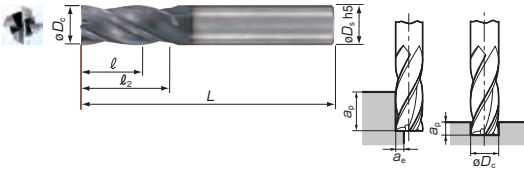
Side Milling (High Speed Machining Center)

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (in)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
< 0.039	60,000	47.24	60,000	47.24	60,000	47.24	60,000	33.46	60,000	28.35	48,000	19.69	32,000	11.81	-	-
< 0.078	47,800	86.61	47,800	86.61	47,800	86.61	47,800	62.99	39,800	47.24	31,800	35.43	15,900	15.75	-	-
< 0.156	23,900	102.36	23,900	102.36	23,900	102.36	23,900	74.80	19,900	55.12	15,900	43.31	8,000	19.29	-	-
< 0.236	16,000	106.30	16,000	106.30	16,000	106.30	16,000	78.74	13,300	59.06	10,600	47.24	5,300	20.47	-	-
< 0.315	12,000	106.30	12,000	106.30	12,000	106.30	12,000	78.74	10,000	59.06	8,000	47.24	4,000	20.47	-	-
< 0.393	9,600	106.30	9,600	106.30	9,600	106.30	9,600	78.74	8,000	59.06	6,400	47.24	3,200	20.47	-	-
< 0.472	8,000	106.30	8,000	106.30	8,000	106.30	8,000	78.74	6,700	59.06	5,300	47.24	2,700	20.47	-	-
< 0.630	6,000	86.61	6,000	86.61	6,000	86.61	6,000	62.99	5,000	47.24	4,000	35.43	2,000	17.72	-	-
< 0.787	4,800	78.74	4,800	78.74	4,800	78.74	4,800	55.12	4,000	43.31	3,200	29.53	1,600	14.96	-	-
Standard Depth-of-cut	a _p	1.5D _c										1.0D _c				
a _e	0.05D _c										0.02D _c					

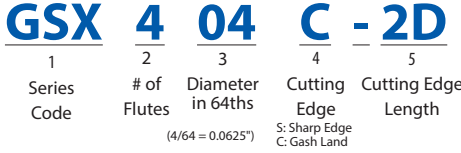
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy		
	D _c (in)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)		
< 0.039	24,000	14.96	24,000	18.50	24,000	18.50	21,000	11.42	14,500	7.09	10,500	4.72	12,600	3.35	5,200	1.18	
< 0.078	12,800	18.11	12,800	22.44	12,800	22.44	12,000	14.96	8,300	9.06	6,000	5.91	7,200	4.33	3,000	1.57	
< 0.156	6,800	22.83	6,800	28.74	6,800	28.74	6,400	19.29	4,400	11.81	3,200	7.87	3,800	5.12	1,600	2.17	
< 0.236	4,600	24.41	4,600	30.71	4,600	30.71	4,300	20.47	3,000	12.60	2,200	8.27	2,650	6.30	1,100	2.56	
< 0.315	3,400	24.41	3,400	30.71	3,400	30.71	3,200	20.47	2,200	12.60	1,600	8.27	2,000	6.30	800	2.56	
< 0.393	2,800	24.41	2,800	30.71	2,800	30.71	2,600	20.47	1,800	12.60	1,300	8.27	1,600	6.30	650	2.56	
< 0.472	2,300	24.41	2,300	30.71	2,300	30.71	2,200	20.47	1,500	12.60	1,100	8.27	1,300	6.30	550	2.56	
< 0.630	1,700	20.47	1,700	22.05	1,700	22.05	1,600	16.54	1,100	11.02	800	6.69	1,000	5.12	400	2.17	
< 0.787	1,350	18.90	1,350	23.62	1,350	23.62	1,300	14.96	900	10.24	650	5.91	800	4.33	320	1.97	
Standard Depth-of-cut	a _p	0.2D _c				0.5D _c				0.2D _c		0.05D _c		0.2D _c			





■ Endmill Identification (GSX Series Only)



■ Recommended Cutting Conditions

- For stable machining performance use rigid, high precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

GSX End Mill- INCH 2D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX404C-2D	○	4	2D	0.0625	1.588	0.1250	0.1250	0.1644	1.500	-
GSX406C-2D	○	4	2D	0.0938	2.381	0.1250	0.1875	0.2269	1.500	-
GSX408C-2D	○	4	2D	0.1250	3.175	0.1250	0.2500	-	2.000	-
GSX410C-2D	○	4	2D	0.1563	3.969	0.1875	0.3125	0.3716	2.000	-
GSX412C-2D	○	4	2D	0.1875	4.763	0.1875	0.3750	-	2.000	-
GSX414C-2D	○	4	2D	0.2188	5.558	0.2500	0.4376	0.516	2.000	-
GSX416C-2D	○	4	2D	0.2500	6.350	0.2500	0.5000	-	2.000	-
GSX418C-2D	○	4	2D	0.2813	7.145	0.3125	0.5626	0.641	2.500	-
GSX420C-2D	○	4	2D	0.3125	7.938	0.3125	0.6250	-	2.500	-
GSX424C-2D	○	4	2D	0.3750	9.525	0.3750	0.7500	-	3.000	-
GSX428C-2D	○	4	2D	0.4375	11.113	0.4375	0.8750	-	3.000	-
GSX432C-2D	○	4	2D	0.5000	12.700	0.5000	1.0000	-	3.000	-
GSX436C-2D	○	4	2D	0.5625	14.288	0.5625	1.1250	-	3.500	-
GSX440C-2D	○	4	2D	0.6250	15.875	0.6250	1.2500	-	3.500	-
GSX444C-2D	○	4	2D	0.6875	17.463	0.6875	1.3750	-	4.000	-
GSX448C-2D	○	4	2D	0.7500	19.050	0.7500	1.5000	-	4.000	-
GSX456C-2D	○	4	2D	0.8750	22.225	0.8750	1.7500	-	4.000	-
GSX464C-2D	○	4	2D	1.0000	25.400	1.0000	2.0000	-	4.000	-

○ - Items Available 1st Quarter 2015

■ Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy					
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)				
< 0.039	24,000	18.50	24,000	18.50	24,000	18.50	21,000	11.42	14,500	7.09	10,500	4.72	12,600	4.72	10,500	3.35				
< 0.078	12,800	22.44	12,800	22.44	12,800	22.44	12,000	14.96	8,300	9.06	6,000	5.91	7,200	6.30	6,000	4.33				
< 0.156	6,800	28.74	6,800	28.74	6,800	28.74	6,400	19.29	4,400	11.81	3,200	7.87	3,800	8.27	3,200	5.12				
< 0.236	4,600	30.71	4,600	30.71	4,600	30.71	4,300	20.47	3,000	12.60	2,200	8.27	2,650	8.66	2,200	5.91				
< 0.315	3,400	30.71	3,400	30.71	3,400	30.71	3,200	20.47	2,200	12.60	1,600	8.27	2,000	8.66	1,600	5.91				
< 0.393	2,800	30.71	2,800	30.71	2,800	30.71	2,600	20.47	1,800	12.60	1,300	8.27	1,500	8.66	1,300	5.91				
< 0.472	2,300	30.71	2,300	30.71	2,300	30.71	2,200	20.47	1,500	12.60	1,100	8.27	1,300	8.66	1,100	5.91				
< 0.630	1,700	25.59	1,700	25.59	1,700	25.59	1,600	16.54	1,100	11.02	800	6.69	1,000	7.09	800	4.72				
< 0.787	1,350	23.62	1,350	23.62	1,350	23.62	1,300	14.96	900	10.24	650	5.91	800	6.30	650	3.94				
< 1.000	1,000	18.90	1,000	18.90	1,000	18.90	1,000	11.81	700	7.87	500	4.72	640	4.72	500	3.15				
Standard Depth-of-cut	a_p		a_e		1.5D _c				0.05D _c				1.0D _c				0.02D _c			

■ Side Milling (High Speed Machining Center)

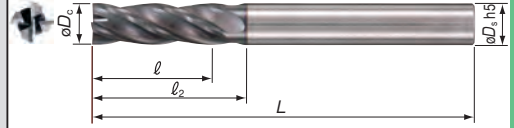
Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy					
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)				
< 0.039	60,000	47.24	60,000	47.24	60,000	47.24	60,000	33.46	60,000	28.35	48,000	19.69	32,000	11.81	-	-				
< 0.078	47,800	86.61	47,800	86.61	47,800	86.61	47,800	62.99	39,800	47.24	31,800	35.43	15,900	15.75	-	-				
< 0.156	23,900	102.36	23,900	102.36	23,900	102.36	23,900	74.80	19,900	55.12	15,900	43.31	8,000	19.29	-	-				
< 0.236	16,000	106.30	16,000	106.30	16,000	106.30	16,000	78.74	13,300	59.06	10,600	47.24	5,300	20.47	-	-				
< 0.315	12,000	106.30	12,000	106.30	12,000	106.30	12,000	78.74	10,000	59.06	8,000	47.24	4,000	20.47	-	-				
< 0.393	9,600	106.30	9,600	106.30	9,600	106.30	9,600	78.74	8,000	59.06	6,400	47.24	3,200	20.47	-	-				
< 0.472	8,000	106.30	8,000	106.30	8,000	106.30	8,000	78.74	6,700	59.06	5,300	47.24	2,700	20.47	-	-				
< 0.630	6,000	86.61	6,000	86.61	6,000	86.61	6,000	62.99	5,000	47.24	4,000	35.43	2,000	17.72	-	-				
< 0.787	4,800	78.74	4,800	78.74	4,800	78.74	4,800	55.12	4,000	43.31	3,200	29.53	1,600	14.96	-	-				
< 1.000	3,800	59.06	3,800	59.06	3,800	59.06	3,800	43.31	3,200	35.43	2,500	23.62	1,300	11.81	-	-				
Standard Depth-of-cut	a_p		a_e		1.5D _c				0.05D _c				1.0D _c				0.02D _c			

■ Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy					
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)				
< 0.039	24,000	14.96	24,000	18.50	24,000	18.50	21,000	11.42	14,500	7.09	10,500	4.72	12,600	3.35	5,200	1.18				
< 0.078	12,800	18.11	12,800	22.44	12,800	22.44	12,000	14.96	8,300	9.06	6,000	5.91	7,200	4.33	3,000	1.57				
< 0.156	6,800	22.83	6,800	28.74	6,800	28.74	5,400	19.29	4,400	11.81	3,200	7.87	3,800	5.12	1,600	2.17				
< 0.236	4,600	24.41	4,600	30.71	4,600	30.71	4,300	20.47	3,000	12.60	2,200	8.27	2,650	6.30	1,100	2.56				
< 0.315	3,400	24.41	3,400	30.71	3,400	30.71	3,200	20.47	2,200	12.60	1,600	8.27	2,000	6.30	800	2.56				
< 0.393	2,800	24.41	2,800	30.71	2,800	30.71	2,600	20.47	1,800	12.60	1,300	8.27	1,600	6.30	650	2.56				
< 0.472	2,300	24.41	2,300	30.71	2,300	30.71	2,200	20.47	1,500	12.60	1,100	8.27	1,300	6.30	550	2.56				
< 0.630	1,700	20.47	1,700	22.05	1,700	22.05	1,600	16.54	1,100	11.02	800	6.69	1,000	5.12	400	2.17				
< 0.787	1,350	18.90	1,350	23.62	1,350	23.62	1,300	14.96	900	10.24	650	5.91	800	4.33	320	1.97				
< 1.000	1,000	14.96	1,000	17.72	1,000	17.72	1,000	11.81	700	7.87	500	4.72	640	3.15	250	1.57				
Standard Depth-of-cut	a_p		a_e		0.5D _c				0.2D _c				0.05D _c				0.2D _c			

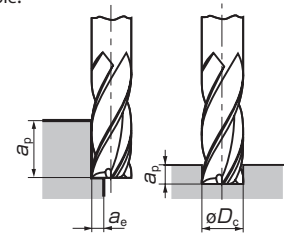
GSX End Mill-INCH 3DGash Land

Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) l	Neck Length (inch) l_2	OAL (inch) L	R (inch)
GSX404C-3D	○	4	3D	0.0625	1.588	0.1250	0.1875	0.2269	1.500	-
GSX406C-3D	○	4	3D	0.0938	2.381	0.1250	0.2813	0.3206	1.500	-
GSX408C-3D	○	4	3D	0.1250	3.175	0.1250	0.3750	-	2.000	-
GSX410C-3D	○	4	3D	0.1563	3.969	0.1875	0.4688	0.5278	2.000	-
GSX412C-3D	○	4	3D	0.1875	4.763	0.1875	0.5625	-	2.000	-
GSX414C-3D	○	4	3D	0.2188	5.558	0.2500	0.6564	0.735	2.000	-
GSX416C-3D	○	4	3D	0.2500	6.350	0.2500	0.7500	-	2.000	-
GSX418C-3D	○	4	3D	0.2813	7.145	0.3125	0.8439	0.923	3.000	-
GSX420C-3D	○	4	3D	0.3125	7.938	0.3125	0.9375	-	3.000	-
GSX424C-3D	○	4	3D	0.3750	9.525	0.3750	1.1250	-	3.500	-
GSX428C-3D	○	4	3D	0.4375	11.113	0.4375	1.3125	-	3.500	-
GSX432C-3D	○	4	3D	0.5000	12.700	0.5000	1.5000	-	3.500	-
GSX436C-3D	○	4	3D	0.5625	14.288	0.5625	1.6875	-	4.500	-
GSX440C-3D	○	4	3D	0.6250	15.875	0.6250	1.8750	-	4.500	-
GSX444C-3D	○	4	3D	0.6875	17.463	0.6875	2.0625	-	4.500	-
GSX448C-3D	○	4	3D	0.7500	19.050	0.7500	2.2500	-	5.000	-
GSX456C-3D	○	4	3D	0.8750	22.225	0.8750	2.6250	-	5.000	-
GSX464C-3D	○	4	3D	1.0000	25.400	1.0000	3.0000	-	5.500	-



Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 4 04 C - 3D

1 Series Code 2 # of Flutes 3 Diameter in 64ths 4 Cutting Edge 5 Cutting Length
 (4/64 = 0.0625")
 S: Sharp Edge
 C: Gash Land

Recommended Cutting Conditions

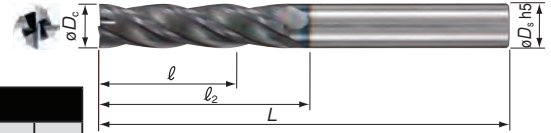
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	21,000	14.17	21,000	14.17	21,000	14.17	19,000	8.66	13,000	5.51	9,000	3.54	10,500	3.54	9,000	2.56
< 0.078	10,500	14.17	10,500	14.17	10,500	14.17	9,600	11.42	7,500	7.09	4,500	4.33	5,200	4.72	4,500	3.35
< 0.156	5,200	19.69	5,200	19.69	5,200	19.69	4,800	14.57	4,000	11.02	2,250	5.91	2,600	6.30	2,250	3.94
< 0.236	3,500	22.05	3,500	22.05	3,500	22.05	3,200	15.75	2,700	11.81	1,500	6.30	1,700	6.69	1,500	4.72
< 0.315	2,600	20.47	2,600	20.47	2,600	20.47	2,400	15.75	2,000	11.81	1,100	6.30	1,300	6.69	1,100	4.72
< 0.393	2,100	19.69	2,100	19.69	2,100	19.69	1,900	15.75	1,600	11.81	900	6.30	1,000	6.30	900	4.72
< 0.472	1,750	19.69	1,750	19.69	1,750	19.69	1,600	15.75	1,350	11.81	750	5.91	850	6.30	750	4.72
< 0.630	1,300	16.54	1,300	16.54	1,300	16.54	1,200	12.99	1,000	10.24	550	4.72	650	5.51	550	3.94
< 0.787	1,050	14.96	1,050	14.96	1,050	14.96	950	11.42	800	9.06	450	4.33	500	4.72	450	3.54
Standard Depth-of-cut	2.5D _c								2.0D _c							
a _p	Below ø3: 0.05D _c From ø3 to below ø8: 0.1D _c ø8 and above: 0.15D _c								0.02D _c							

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	16,600	5.51	16,600	5.51	16,600	5.51	15,500	3.94	10,500	3.94	7,500	2.76	9,400	2.36	3,750	0.79
< 0.078	9,500	6.30	9,500	6.30	9,500	6.30	9,000	7.09	6,200	4.72	4,500	3.54	5,200	3.15	2,250	1.18
< 0.156	5,200	6.30	5,200	7.09	5,200	7.09	4,800	6.30	3,400	4.33	2,200	2.56	2,600	2.76	1,250	0.98
< 0.236	3,500	6.30	3,500	7.87	3,500	7.87	3,200	6.30	2,550	4.72	1,500	2.56	1,700	2.76	950	0.98
< 0.315	2,600	6.30	2,600	7.87	2,600	7.87	2,400	6.30	1,900	4.72	1,100	2.56	1,300	2.76	700	0.98
< 0.393	2,100	6.30	2,100	7.87	2,100	7.87	1,900	6.30	1,500	4.72	900	2.56	1,000	2.76	550	0.98
< 0.472	1,750	6.30	1,750	7.87	1,750	7.87	1,600	6.30	1,250	4.72	750	2.56	850	2.76	450	0.98
< 0.630	1,300	6.30	1,300	7.87	1,300	7.87	1,200	6.30	950	4.72	550	2.56	650	2.76	350	0.98
< 0.787	1,050	6.30	1,050	7.87	1,050	7.87	950	6.30	750	4.72	450	2.56	500	2.76	280	0.98
Standard Depth-of-cut	0.1D _c		0.2D _c								0.05D _c		0.1D _c			



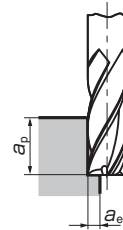


GSX End Mill-INCH 4D Gash Land

Item	Stock	Flutes	Length	Diam. (inch) φD _C	Diam. (mm) φD _C	Shank Diam. (inch) φD _S	Flute Length (inch) ℓ	Neck Length (inch) ℓ ₂	OAL (inch) L	R (inch)
GSX404C-4D	○	4	4D	0.0625	1.588	0.1250	0.2500	0.2894	1.500	-
GSX406C-4D	○	4	4D	0.0938	2.381	0.1250	0.3750	0.4144	1.500	-
GSX408C-4D	○	4	4D	0.1250	3.175	0.1250	0.5000	-	2.000	-
GSX410C-4D	○	4	4D	0.1563	3.969	0.1875	0.6250	0.6841	2.000	-
GSX412C-4D	○	4	4D	0.1875	4.763	0.1875	0.7500	-	2.500	-
GSX414C-4D	○	4	4D	0.2188	5.558	0.2500	0.8752	0.954	2.500	-
GSX416C-4D	○	4	4D	0.2500	6.350	0.2500	1.0000	-	2.500	-
GSX418C-4D	○	4	4D	0.2813	7.145	0.3125	1.1252	1.204	3.000	-
GSX420C-4D	○	4	4D	0.3125	7.938	0.3125	1.2500	-	3.000	-
GSX424C-4D	○	4	4D	0.3750	9.525	0.3750	1.5000	-	3.500	-
GSX428C-4D	○	4	4D	0.4375	11.113	0.4375	1.7500	-	4.000	-
GSX432C-4D	○	4	4D	0.5000	12.700	0.5000	2.0000	-	4.000	-
GSX436C-4D	○	4	4D	0.5625	14.288	0.5625	2.2500	-	5.000	-
GSX440C-4D	○	4	4D	0.6250	15.875	0.6250	2.5000	-	5.000	-
GSX444C-4D	○	4	4D	0.6875	17.463	0.6875	2.7500	-	5.000	-
GSX448C-4D	○	4	4D	0.7500	19.050	0.7500	3.0000	-	5.500	-
GSX456C-4D	○	4	4D	0.8750	22.225	0.8750	3.5000	-	5.500	-
GSX464C-4D	○	4	4D	1.0000	25.400	1.0000	4.0000	-	6.000	-

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for grooving.
7. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



○ - Items Available 1st Quarter 2015

Endmill Identification (GSX MILL Series Only)

GSX 4 04 C - 4D

1 Series Code 2 # of Flutes 3 Diameter in 64ths (4/64 = 0.0625") 4 Cutting Edge 5 Cutting Length
S: Sharp Edge C: Gash Land

Recommended Cutting Conditions

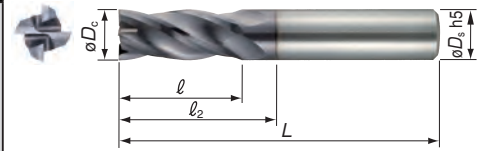
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c mm	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
< 0.039	9,000	5.51	9,000	5.51	9,000	5.51	7,000	3.15	6,500	2.36	4,500	1.57	5,400	1.57	4,500	1.57
< 0.078	4,500	5.51	4,500	5.51	4,500	5.51	3,500	3.94	3,200	3.15	2,300	2.17	2,700	2.17	2,300	1.57
< 0.156	2,250	7.87	2,250	7.87	2,250	7.87	1,750	4.72	1,600	3.94	1,200	2.36	1,350	1.97	1,200	1.38
< 0.236	1,500	9.84	1,500	9.84	1,500	9.84	1,150	6.30	1,050	5.51	800	2.56	900	1.77	800	1.38
< 0.315	1,100	8.66	1,100	8.66	1,100	8.66	850	6.30	800	5.12	600	2.56	660	1.77	600	1.38
< 0.393	900	8.27	900	8.27	900	8.27	700	5.51	650	4.72	460	2.56	540	1.77	460	1.38
< 0.472	750	7.87	750	7.87	750	7.87	580	5.51	520	4.33	400	2.56	450	1.77	400	1.38
< 0.630	550	6.69	550	6.69	550	6.69	440	4.72	400	3.74	300	2.17	330	1.77	300	1.38
< 0.787	450	5.91	450	5.91	450	5.91	350	3.94	320	3.15	240	1.97	270	1.77	240	1.38
Standard Depth-of-cut	a _p	3.5D _c										3.0D _c		0.02D _c		
	a _e	Below ø3: 0.04D _c From ø3 to below ø8: 0.08D _c ø8 and above: 0.1D _c														



GSX End Mill-INCH 2DSharp Edge

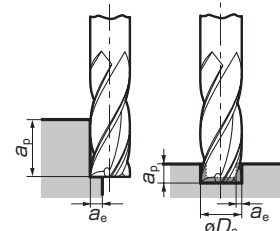
Item	Stock	Flutes	Length	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSX404S-2D	○	4	2D	0.0625	1.588	0.1250	0.1250	0.1644	1.500	-
GSX406S-2D	○	4	2D	0.0938	2.381	0.1250	0.1875	0.2269	1.500	-
GSX408S-2D	○	4	2D	0.1250	3.175	0.1250	0.2500	-	2.000	-
GSX410S-2D	○	4	2D	0.1563	3.969	0.1875	0.3125	0.3716	2.000	-
GSX412S-2D	○	4	2D	0.1875	4.763	0.1875	0.3750	-	2.000	-
GSX414S-2D	○	4	2D	0.2188	5.558	0.2500	0.4376	0.516	2.000	-
GSX416S-2D	○	4	2D	0.2500	6.350	0.2500	0.5000	-	2.000	-
GSX418S-2D	○	4	2D	0.2813	7.145	0.3125	0.5626	0.641	2.500	-
GSX420S-2D	○	4	2D	0.3125	7.938	0.3125	0.6250	-	2.500	-
GSX424S-2D	○	4	2D	0.3750	9.525	0.3750	0.7500	-	3.000	-
GSX428S-2D	○	4	2D	0.4375	11.113	0.4375	0.8750	-	3.000	-
GSX432S-2D	○	4	2D	0.5000	12.700	0.5000	1.0000	-	3.000	-
GSX436S-2D	○	4	2D	0.5625	14.288	0.5625	1.1250	-	3.500	-
GSX440S-2D	○	4	2D	0.6250	15.875	0.6250	1.2500	-	3.500	-
GSX444S-2D	○	4	2D	0.6875	17.463	0.6875	1.3750	-	4.000	-
GSX448S-2D	○	4	2D	0.7500	19.050	0.7500	1.5000	-	4.000	-
GSX456S-2D	○	4	2D	0.8750	22.225	0.8750	1.7500	-	4.000	-
GSX464S-2D	○	4	2D	1.0000	25.400	1.0000	2.0000	-	4.000	-



■ Endmill Identification (GSX Series Only)

GSX 4 04 S - 2D

1 Series Code 2 # of Flutes 3 Diameter in 64ths (4/64 = 0.0625") 4 Cutting Edge C: Sharp Edge 5 Cutting Length



■ Recommended Cutting Conditions

○ - Items Available 1st Quarter 2015

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- This series is not recommended for groove milling.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

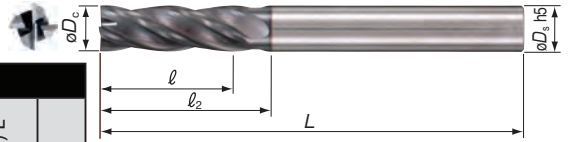
■ Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy			
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)		
< 0.039	22,000	14.173	22,000	14.173	22,000	14.173	19,000	8.661	13,000	5.512	9,500	3.543	11,300	3.543	9,500	2.559		
< 0.078	11,500	17.323	11,500	17.323	11,500	17.323	11,000	11.417	7,500	7.087	5,400	4.331	6,500	4.724	5,400	3.346		
< 0.156	6,000	22.047	6,000	22.047	6,000	22.047	5,800	14.567	4,000	9.055	2,900	5.906	3,400	6.299	2,900	3.937		
< 0.236	4,200	23.622	4,200	23.622	4,200	23.622	4,000	15.748	2,700	9.449	2,000	6.299	2,400	6.693	2,000	4.724		
< 0.312	3,000	23.622	3,000	23.622	3,000	23.622	2,800	15.748	2,000	9.449	1,450	6.299	1,800	6.693	1,450	4.724		
< 0.393	2,500	23.622	2,500	23.622	2,500	23.622	2,350	15.748	1,600	9.449	1,200	6.299	1,450	6.693	1,200	4.724		
< 0.472	2,100	23.622	2,100	23.622	2,100	23.622	2,000	15.748	1,350	9.449	1,000	6.299	1,200	6.693	1,000	4.724		
< 0.630	1,500	19.685	1,500	19.685	1,500	19.685	1,450	12.598	1,000	8.268	750	5.118	900	5.512	750	3.543		
< 0.787	1,200	18.110	1,200	18.110	1,200	18.110	1,150	11.417	800	7.874	600	4.331	700	4.724	600	2.953		
Standard Depth-of-cut a_p	2.0D _c										0.01D _c							
a_e	0.03D _c																	

■ Groove Finishing

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)
< 0.039	22,000	14.173	22,000	14.173	22,000	14.173	19,000	8.661	13,000	5.512	9,500	3.543	11,300	3.543	9,500	2.559
< 0.078	11,500	17.323	11,500	17.323	11,500	17.323	11,000	11.417	7,500	7.087	5,400	4.331	6,500	4.724	5,400	3.346
< 0.156	6,000	22.047	6,000	22.047	6,000	22.047	5,800	14.567	4,000	9.055	2,900	5.906	3,400	6.299	2,900	3.937
< 0.236	4,200	23.622	4,200	23.622	4,200	23.622	4,000	15.748	2,700	9.449	2,000	6.299	2,400	6.693	2,000	4.724
< 0.312	3,000	23.622	3,000	23.622	3,000	23.622	2,800	15.748	2,000	9.449	1,450	6.299	1,800	6.693	1,450	4.724
< 0.393	2,500	23.622	2,500	23.622	2,500	23.622	2,350	15.748	1,600	9.449	1,200	6.299	1,450	6.693	1,200	4.724
< 0.472	2,100	23.622	2,100	23.622	2,100	23.622	2,000	15.748	1,350	9.449	1,000	6.299	1,200	6.693	1,000	4.724
< 0.630	1,500	19.685	1,500	19.685	1,500	19.685	1,450	12.598	1,000	8.268	750	5.118	900	5.512	750	3.543
< 0.787	1,200	18.110	1,200	18.110	1,200	18.110	1,150	11.417	800	7.874	600	4.331	700	4.724	600	2.953
Standard Depth-of-cut a_p	1.5D _c															
a_e	Below 0.02D _c															





GSX End Mill-INCH 3D Sharp Edge

Item	Stock	Flutes	Length	Diam. (inch) φD _c	Diam. (mm) φD _c	Shank Diam. (inch) φD _s	Flute Length (inch) l	Neck Length (inch) l ₂	OAL (inch) L	R (inch)
GSX404S-3D	○	4	3D	0.0625	1.588	0.1250	0.1875	0.2269	1.500	-
GSX406S-3D	○	4	3D	0.0938	2.381	0.1250	0.2813	0.3206	1.500	-
GSX408S-3D	○	4	3D	0.1250	3.175	0.1250	0.3750	-	2.000	-
GSX410S-3D	○	4	3D	0.1563	3.969	0.1875	0.4688	0.5278	2.000	-
GSX412S-3D	○	4	3D	0.1875	4.763	0.1875	0.5625	-	2.000	-
GSX414S-3D	○	4	3D	0.2188	5.558	0.2500	0.6564	0.735	2.000	-
GSX416S-3D	○	4	3D	0.2500	6.350	0.2500	0.7500	-	2.000	-
GSX418S-3D	○	4	3D	0.2813	7.145	0.3125	0.8439	0.923	3.000	-
GSX420S-3D	○	4	3D	0.3125	7.938	0.3125	0.9375	-	3.000	-
GSX424S-3D	○	4	3D	0.3750	9.525	0.3750	1.1250	-	3.500	-
GSX428S-3D	○	4	3D	0.4375	11.113	0.4375	1.3125	-	3.500	-
GSX432S-3D	○	4	3D	0.5000	12.700	0.5000	1.5000	-	3.500	-
GSX436S-3D	○	4	3D	0.5625	14.288	0.5625	1.6875	-	4.500	-
GSX440S-3D	○	4	3D	0.6250	15.875	0.6250	1.8750	-	4.500	-
GSX444S-3D	○	4	3D	0.6875	17.463	0.6875	2.0625	-	4.500	-
GSX448S-3D	○	4	3D	0.7500	19.050	0.7500	2.2500	-	5.000	-
GSX456S-3D	○	4	3D	0.8750	22.225	0.8750	2.6250	-	5.000	-
GSX464S-3D	○	4	3D	1.0000	25.400	1.0000	3.0000	-	5.500	-

Endmill Identification (GSX Series Only)

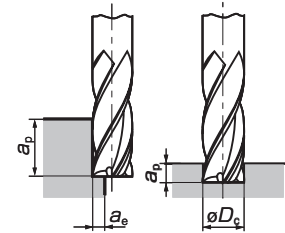
GSX 4 04 S - 3D

1 Series Code 2 # of Flutes 3 Diameter in 64ths (4/64 = 0.0625") 4 Cutting Edge (S: Sharp Edge, C: Gash Land) 5 Cutting Length

Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- In rare cases, chatter may occur in early milling stages, dissipating after 2m of cutting.
- If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

○ - Items Available 1st Quarter 2015



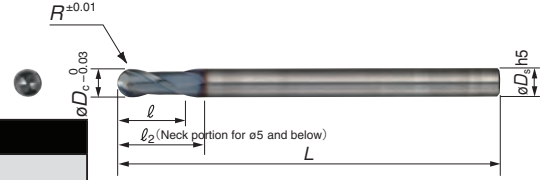
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (in)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
< 0.039	18,500	9.843	18,500	9.843	18,500	9.843	17,000	5.906	11,500	3.937	8,000	2.559	9,400	2.559	8,000	1.772
< 0.078	9,400	9.843	9,400	9.843	9,400	9.843	8,500	7.874	6,700	5.118	4,000	2.559	4,600	3.543	4,000	2.362
< 0.156	4,500	13.780	4,500	13.780	4,500	13.780	4,300	9.843	3,500	8.268	2,000	4.331	2,300	4.331	2,000	2.756
< 0.236	3,100	15.748	3,100	15.748	3,100	15.748	2,800	11.811	2,400	8.661	1,300	4.724	1,500	4.724	1,300	3.543
< 0.312	2,300	14.961	2,300	14.961	2,300	14.961	2,100	11.811	1,800	8.661	950	4.724	1,100	4.724	900	3.543
< 0.393	1,800	13.780	1,800	13.780	1,800	13.780	1,700	11.811	1,400	8.661	700	4.724	900	4.724	800	3.543
< 0.472	1,500	13.780	1,500	13.780	1,500	13.780	1,400	11.811	1,200	8.661	650	4.331	750	4.724	650	3.543
< 0.630	1,100	11.811	1,100	11.811	1,100	11.811	1,000	9.449	900	7.480	480	3.543	550	3.937	490	2.756
< 0.787	900	11.024	900	11.024	900	11.024	850	8.268	700	6.693	400	3.150	440	3.543	400	2.362
Standard Depth-of-cut	a _p 2.5D _c								2.0D _c							
Depth-of-cut	a _e Below ø3: 0.02D _c From ø3 to below ø8: 0.05D _c ø8 and above: 0.07D _c								0.01D _c							

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (in)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
< 0.039	18,500	9.843	18,500	9.843	18,500	9.843	17,000	5.906	11,500	3.937	8,000	2.559	9,400	2.559	8,000	1.772
< 0.078	9,400	9.843	9,400	9.843	9,400	9.843	8,500	7.874	6,700	5.118	4,000	2.559	4,600	3.543	4,000	2.362
< 0.156	4,500	13.780	4,500	13.780	4,500	13.780	4,300	9.843	3,500	8.268	2,000	4.331	2,300	4.331	2,000	2.756
< 0.236	3,100	15.748	3,100	15.748	3,100	15.748	2,800	11.811	2,400	8.661	1,300	4.724	1,500	4.724	1,300	3.543
< 0.312	2,300	14.961	2,300	14.961	2,300	14.961	2,100	11.811	1,800	8.661	950	4.724	1,100	4.724	900	3.543
< 0.393	1,800	13.780	1,800	13.780	1,800	13.780	1,700	11.811	1,400	8.661	700	4.724	900	4.724	800	3.543
< 0.472	1,500	13.780	1,500	13.780	1,500	13.780	1,400	11.811	1,200	8.661	650	4.331	750	4.724	650	3.543
< 0.630	1,100	11.811	1,100	11.811	1,100	11.811	1,000	9.449	900	7.480	480	3.543	550	3.937	490	2.756
< 0.787	900	11.024	900	11.024	900	11.024	850	8.268	700	6.693	400	3.150	440	3.543	400	2.362
Standard Depth-of-cut	a _p 0.02D _c Max.															



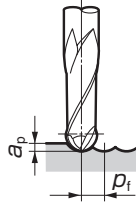


GSX End Mill-INCH Ballnose									
Item	Stock	Flutes	Diam. (inch) ϕD_c	Diam. (mm) ϕD_c	Shank Diam. (inch) ϕD_s	Flute Length (inch) ℓ	Neck Length (inch) ℓ_2	OAL (inch) L	R (inch)
GSXB204	○	2	0.0625	1.588	0.1250	0.0938	0.1331	2.000	0.0313
GSXB206	○	2	0.0938	2.381	0.1250	0.1406	0.1800	2.500	0.0469
GSXB208	○	2	0.1250	3.175	0.1250	0.1875	-	2.500	0.0625
GSXB210	○	2	0.1563	3.969	0.1875	0.2344	0.2934	3.000	0.0781
GSXB212	○	2	0.1875	4.763	0.1875	0.2813	-	3.000	0.0938
GSXB214	○	2	0.2188	5.558	0.2500	0.3282	0.407	3.000	0.1094
GSXB216	○	2	0.2500	6.350	0.2500	0.3750	-	3.000	0.1250
GSXB218	○	2	0.2813	7.145	0.3125	0.4220	0.501	3.500	0.1407
GSXB220	○	2	0.3125	7.938	0.3125	0.4688	-	3.500	0.1563
GSXB224	○	2	0.3750	9.525	0.3750	0.5625	-	4.000	0.1875
GSXB228	○	2	0.4375	11.113	0.4375	0.6563	-	4.000	0.2188
GSXB232	○	2	0.5000	12.700	0.5000	0.7500	-	4.500	0.2500
GSXB236	○	2	0.5625	14.288	0.5625	0.8438	-	4.500	0.2813
GSXB240	○	2	0.6250	15.875	0.6250	0.9375	-	5.500	0.3125
GSXB244	○	2	0.6875	17.463	0.6875	1.0313	-	5.500	0.3438
GSXB248	○	2	0.7500	19.050	0.7500	1.1250	-	6.000	0.3750
GSXB256	○	2	0.8750	22.225	0.8750	1.3125	-	6.500	0.4375
GSXB264	○	2	1.0000	25.400	1.0000	1.5000	-	7.000	0.5000

○ - Items Available 1st Quarter 2015

■ Recommended Cutting Conditions

1. If cutting noise and vibration are present, please change the cutting conditions accordingly.
2. If the machine is not designed to achieve the recommended spindle speed, please use the max. spindle speed available.



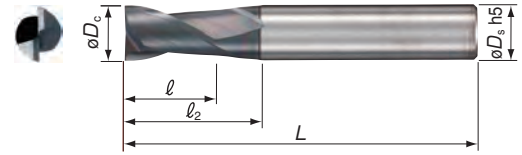
■ Radius Milling

Work Material	Carbon Steel, Alloy Steel (Below 25HRC)		Carbon Steel, Alloy Steel (Below 50HRC)		Cast Iron Special Cast Iron		Stainless Steel Titanium Alloy		
	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	Spindle Speed (min ⁻¹)	Feed Rate (IPM)	
0.20	50,000	2,100	35,000	1,150	50,000	2,100	50,000	1,750	
0.30	50,000	2,500	35,000	1,350	50,000	2,500	50,000	2,100	
0.50	50,000	3,000	35,000	1,600	50,000	3,000	50,000	2,500	
0.75	35,000	3,000	24,000	1,650	35,000	3,200	34,000	2,500	
1.00	27,500	3,000	19,000	1,700	35,000	3,900	26,000	2,500	
1.25	22,500	3,000	15,500	1,700	28,000	3,900	21,000	2,500	
1.50	19,000	3,000	13,000	1,700	24,000	3,900	17,500	2,500	
2.00	17,000	3,800	12,000	2,100	20,000	4,100	15,000	2,700	
2.50	15,500	4,300	11,000	2,200	18,000	4,600	12,000	2,500	
3.00	14,000	4,700	10,500	2,500	16,500	5,300	10,500	2,500	
3.50	12,500	4,200	9,000	2,100	14,000	4,500	9,000	2,200	
4.00	11,000	3,500	7,900	1,900	12,500	4,000	7,800	1,900	
5.00	9,000	2,800	6,300	1,500	10,500	3,300	6,300	1,500	
6.00	7,500	2,400	5,200	1,250	8,700	2,800	5,200	1,250	
7.00	6,400	2,100	4,500	1,100	7,400	2,400	4,500	1,100	
8.00	5,600	1,800	3,900	950	6,500	2,100	3,900	950	
9.00	5,000	1,600	3,500	850	5,800	1,900	3,500	850	
10.00	4,500	1,450	3,100	750	5,200	1,700	3,150	750	
12.50	3,600	1,150	2,500	600	4,200	1,350	2,500	600	
Standard Depth-of-cut	a_p	0.02D _c		0.02D _c		0.02D _c		0.02D _c	
	p_f	0.05D _c		0.05D _c		0.05D _c		0.05D _c	



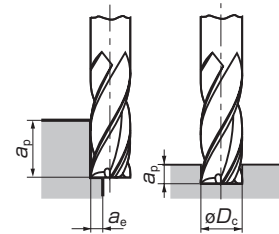
GSX End Mill-METRIC 1.5D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX20100C-1.5D	★	Square	2	1.0	4	1.5	2.5	40	-
GSX20150C-1.5D	★	Square	2	1.5	4	2.3	3.3	40	-
GSX20200C-1.5D	★	Square	2	2.0	4	3.0	4.0	40	-
GSX20250C-1.5D	★	Square	2	2.5	4	3.8	4.8	40	-
GSX20300C-1.5D	★	Square	2	3.0	6	4.5	6.0	45	-
GSX20350C-1.5D	★	Square	2	3.5	6	5.3	6.8	45	-
GSX20400C-1.5D	★	Square	2	4.0	6	6.0	7.5	45	-
GSX20450C-1.5D	★	Square	2	4.5	6	6.8	8.3	50	-
GSX20500C-1.5D	★	Square	2	5.0	6	7.5	9.5	50	-
GSX20550C-1.5D	★	Square	2	5.5	6	8.3	10.3	50	-
GSX20600C-1.5D	★	Square	2	6.0	6	9.0	-	50	-
GSX20700C-1.5D	★	Square	2	7.0	8	11.0	13.0	60	-
GSX20800C-1.5D	★	Square	2	8.0	8	12.0	-	60	-
GSX20900C-1.5D	★	Square	2	9.0	10	14.0	16.0	70	-
GSX21000C-1.5D	★	Square	2	10.0	10	15.0	-	70	-
GSX21200C-1.5D	★	Square	2	12.0	12	18.0	-	75	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



★ - World Wide Warehouse Item

Endmill Identification (GSX MILL Series Only)

GSX 2 1000 C - 1.5D

1 Series Code 2 No. of Teeth 3 Diameter x 100 4 Cutting Edge 5 Cutting Length

(10mm x 100 = 1000) (S: Sharp Edge C: Gash Land)

Recommended Cutting Conditions

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy						
	D_c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)						
1.0	19,600	250	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	70	9,000	50					
2.0	11,200	340	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	90	5,300	70					
4.0	6,400	460	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	120	3,000	90					
6.0	4,600	560	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	140	2,200	100					
8.0	3,400	560	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	140	1,600	100					
10.0	2,800	560	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	140	1,300	100					
12.0	2,300	560	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	140	1,100	100					
16.0	1,700	450	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	110	800	85					
20.0	1,350	380	1,350	380	1,350	380	1,300	280	900	160	650	90	800	100	650	75					
Standard Depth-of-cut	a_p	$1.5D_c$						$0.05D_c$						$1.0D_c$				$0.02D_c$			

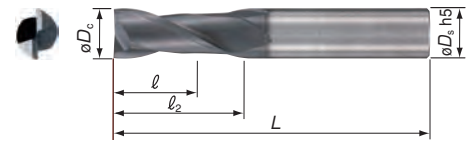
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D_c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
1.0	19,600	200	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	50	4,500	20
2.0	11,200	270	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	65	2,650	25
4.0	6,400	370	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	80	1,500	35
6.0	4,600	450	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	100	1,100	40
8.0	3,400	450	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	100	800	40
10.0	2,800	450	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	100	650	40
12.0	2,300	450	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	100	500	40
16.0	1,700	360	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	80	400	35
20.0	1,350	300	1,350	380	1,350	380	1,300	280	900	160	650	90	800	70	320	30
Standard Depth-of-cut	a_p	$0.2D_c$		$0.5D_c$				$0.2D_c$		$0.05D_c$		$0.2D_c$				



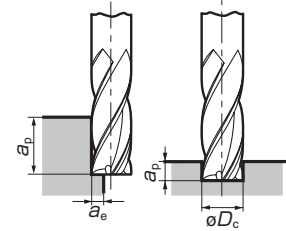
GSX End Mill-METRIC 2D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX20050C-2D	★	Square	2	0.5	4	1.0	1.4	40	-
GSX20100C-2D	★	Square	2	1.0	4	2.0	3.0	40	-
GSX20150C-2D	★	Square	2	1.5	4	3.0	4.0	40	-
GSX20200C-2D	★	Square	2	2.0	4	4.0	5.0	40	-
GSX20250C-2D	★	Square	2	2.5	4	5.0	6.0	40	-
GSX20300C-2D	★	Square	2	3.0	6	6.0	7.5	45	-
GSX20350C-2D	★	Square	2	3.5	6	7.0	8.5	45	-
GSX20400C-2D	★	Square	2	4.0	6	8.0	9.5	45	-
GSX20450C-2D	★	Square	2	4.5	6	9.0	10.5	50	-
GSX20500C-2D	★	Square	2	5.0	6	10.0	12.0	50	-
GSX20550C-2D	★	Square	2	5.5	6	11.0	13.0	50	-
GSX20600C-2D	★	Square	2	6.0	6	12.0	-	50	-
GSX20700C-2D	★	Square	2	7.0	8	14.0	16.0	60	-
GSX20800C-2D	★	Square	2	8.0	8	16.0	-	60	-
GSX20900C-2D	★	Square	2	9.0	10	18.0	20.0	70	-
GSX21000C-2D	★	Square	2	10.0	10	20.0	-	70	-
GSX21200C-2D	★	Square	2	12.0	12	24.0	-	75	-
GSX21600C-2D	★	Square	2	16.0	16	32.0	-	90	-
GSX22000C-2D	★	Square	2	20.0	20	40.0	-	100	-
GSX22500C-2D	★	Square	2	25.0	25	50.0	-	120	-



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSX MILL Series Only)

★ - World Wide Warehouse Item

GSX 2 0050 C - 2D

Series Code	No. of Teeth	Diameter x100	Cutting Edge	Cutting Length
1	2	3	4	5

(10mm x 100 = 1000) S: Sharp Edge
C: Gash Land

Recommended Cutting Conditions

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	19,600	250	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	70	9,000	50
2.0	11,200	340	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	90	5,300	70
4.0	6,400	460	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	120	3,000	90
6.0	4,600	560	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	140	2,200	100
8.0	3,400	560	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	140	1,600	100
10.0	2,800	560	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	140	1,300	100
12.0	2,300	560	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	140	1,100	100
16.0	1,700	450	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	110	800	85
20.0	1,350	380	1,350	380	1,350	380	1,300	280	900	160	650	90	800	100	650	75
25.0	1,000	300	1,000	300	1,000	300	1,000	220	700	120	500	70	640	80	500	60
Standard Depth-of-cut a_p	1.5D _c												1.0D _c			
Depth-of-cut a_e	0.05D _c												0.02D _c			

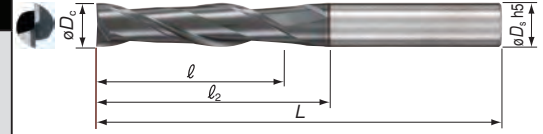
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	19,600	200	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	50	4,500	20
2.0	11,200	270	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	65	2,650	25
4.0	6,400	370	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	80	1,500	35
6.0	4,600	450	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	100	1,100	40
8.0	3,400	450	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	100	800	40
10.0	2,800	450	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	100	650	40
12.0	2,300	450	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	100	500	40
16.0	1,700	360	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	80	400	35
20.0	1,350	300	1,350	380	1,350	380	1,300	280	900	160	650	90	800	70	320	30
25.0	1,000	240	1,000	300	1,000	300	1,000	220	700	120	500	70	640	55	250	25
Standard Depth-of-cut a_p	0.2D _c		0.5D _c				0.2D _c		0.05D _c		0.2D _c					



GSX End Mill-METRIC 3D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX20100C-3D	★	Square	2	1.0	4	3.0	4.0	40	-
GSX20150C-3D	★	Square	2	1.5	4	4.5	5.5	40	-
GSX20200C-3D	★	Square	2	2.0	4	6.0	7.0	40	-
GSX20250C-3D	★	Square	2	2.5	4	7.5	8.5	40	-
GSX20300C-3D	★	Square	2	3.0	6	9.0	10.5	50	-
GSX20400C-3D	★	Square	2	4.0	6	12.0	13.5	50	-
GSX20500C-3D	★	Square	2	5.0	6	15.0	17.0	50	-
GSX20600C-3D	★	Square	2	6.0	6	18.0	-	50	-
GSX20800C-3D	★	Square	2	8.0	8	24.0	-	70	-
GSX21000C-3D	★	Square	2	10.0	10	30.0	-	90	-
GSX21200C-3D	★	Square	2	12.0	12	36.0	-	90	-
GSX21600C-3D	★	Square	2	16.0	16	48.0	-	110	-



Recommended Cutting Conditions

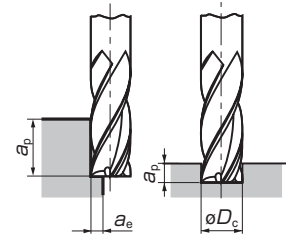
1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

★ - World Wide Warehouse Item

Endmill Identification (GSX MILL Series Only)

GSX 2 0050 C - 3D

1 Series Code 2 No. of Teeth 3 Diameter x100 4 Cutting Edge 5 Cutting Length
 (10mm x 100 = 1000) S: Sharp Edge C: Gash Land



Recommended Cutting Conditions
Side Milling

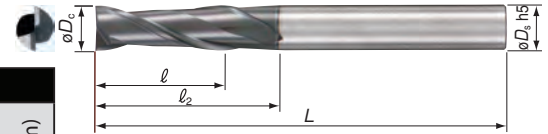
Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D_c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
1.0	16,600	190	16,600	190	16,600	190	15,500	140	10,500	70	7,500	45	9,400	50	7,500	35
2.0	9,500	250	9,500	250	9,500	250	9,000	200	6,200	120	4,500	60	5,200	70	4,500	50
4.0	5,200	330	5,200	330	5,200	330	4,800	200	3,400	150	2,250	75	2,600	90	2,250	65
6.0	3,500	360	3,500	360	3,500	360	3,200	250	2,550	170	1,500	90	1,700	100	1,500	80
8.0	2,600	320	2,600	320	2,600	320	2,400	240	1,900	170	1,100	90	1,300	100	1,100	80
10.0	2,100	300	2,100	300	2,100	300	1,900	230	1,500	170	900	90	1,000	100	900	80
12.0	1,750	280	1,750	280	1,750	280	1,600	230	1,250	170	750	90	850	100	750	80
16.0	1,300	240	1,300	240	1,300	240	1,200	200	950	150	550	75	650	85	550	65
20.0	1,050	220	1,050	220	1,050	220	950	180	750	140	450	70	500	75	450	60
Standard Depth-of-cut a_p	2.5 D_c										2.0 D_c					
a_e	Below $\phi 3$ 0.05 D_c and above 0.1 D_c										0.02 D_c					

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D_c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
1.0	16,600	70	16,600	80	16,600	80	15,500	50	10,500	50	7,500	35	9,400	30	3,750	10
2.0	9,500	80	9,500	100	9,500	100	9,000	90	6,200	60	4,500	45	5,200	40	2,250	15
4.0	5,200	120	5,200	150	5,200	150	4,800	120	3,400	80	2,200	50	2,600	50	1,250	20
6.0	3,500	140	3,500	170	3,500	170	3,200	130	2,550	100	1,500	50	1,700	60	950	25
8.0	2,600	140	2,600	160	2,600	160	2,400	130	1,900	100	1,100	50	1,300	60	700	25
10.0	2,100	130	2,100	150	2,100	150	1,900	120	1,500	90	900	50	1,000	60	550	25
12.0	1,750	130	1,750	150	1,750	150	1,600	120	1,250	90	750	50	850	60	450	25
16.0	1,300	110	1,300	130	1,300	130	1,200	110	950	80	550	45	650	50	350	20
20.0	1,050	100	1,050	120	1,050	120	950	100	750	70	450	40	500	40	280	15
Standard Depth-of-cut a_p	0.1 D_c		0.2 D_c				0.05 D_c				0.1 D_c					



GSX End Mill-METRIC 4D Gash Land									
ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX20100C-4D	★	Square	2	1.0	4	4.0	5.0	40	-
GSX20150C-4D	★	Square	2	1.5	4	6.0	7.0	40	-
GSX20200C-4D	★	Square	2	2.0	4	8.0	9.0	40	-
GSX20250C-4D	★	Square	2	2.5	4	10.0	11.0	50	-
GSX20300C-4D	★	Square	2	3.0	6	12.0	13.5	50	-
GSX20400C-4D	★	Square	2	4.0	6	16.0	17.5	50	-
GSX20500C-4D	★	Square	2	5.0	6	20.0	22.0	60	-
GSX20600C-4D	★	Square	2	6.0	6	24.0	-	60	-
GSX20800C-4D	★	Square	2	8.0	8	32.0	-	80	-
GSX21000C-4D	★	Square	2	10.0	10	40.0	-	90	-
GSX21200C-4D	★	Square	2	12.0	12	48.0	-	100	-



Recommended Cutting Conditions

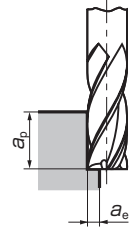
1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rear cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for grooving.
7. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

Endmill Identification (GSX MILL Series Only)

★ - World Wide Warehouse Item

GSX 2 0050 C - 4D

1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Length
		(10mm x 100 = 1000)	S: Sharp Edge C: Gash Land	



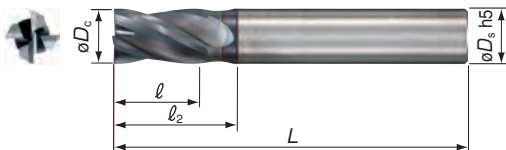
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy			
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		
1.0	9,000	130	9,000	130	9,000	130	7,000	95	6,500	50	4,500	30	5,400	40	4,500	25		
2.0	4,500	180	4,500	180	4,500	180	3,500	120	3,200	70	2,300	40	2,700	50	2,300	35		
4.0	2,250	240	2,250	240	2,250	240	1,750	160	1,600	95	1,200	60	1,350	65	1,200	40		
6.0	1,500	300	1,500	300	1,500	300	1,150	170	1,050	110	800	70	900	70	800	50		
8.0	1,100	260	1,100	260	1,100	260	850	170	800	110	600	70	660	70	600	50		
10.0	900	250	900	250	900	250	700	160	650	110	460	70	540	70	460	50		
12.0	750	240	750	240	750	240	580	160	520	110	400	70	450	70	400	50		
16.0	550	200	550	200	550	200	440	140	400	95	300	55	330	60	300	45		
20.0	450	180	450	180	450	180	350	120	320	85	240	45	270	50	240	40		
Standard Depth-of-cut	a_p		$3.5D_c$				$3.0D_c$				$0.08D_c$				$0.04D_c$			



GSX End Mill-METRIC 1.5D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX40100C-1.5D	★	Square	4	1.0	4	1.5	2.5	40	-
GSX40150C-1.5D	★	Square	4	1.5	4	2.3	3.3	40	-
GSX40200C-1.5D	★	Square	4	2.0	4	3.0	4.0	40	-
GSX40250C-1.5D	★	Square	4	2.5	4	3.8	4.8	40	-
GSX40300C-1.5D	★	Square	4	3.0	6	4.5	6.0	45	-
GSX40350C-1.5D	★	Square	4	3.5	6	5.3	6.8	45	-
GSX40400C-1.5D	★	Square	4	4.0	6	6.0	7.5	45	-
GSX40450C-1.5D	★	Square	4	4.5	6	6.8	8.3	50	-
GSX40500C-1.5D	★	Square	4	5.0	6	7.5	9.5	50	-
GSX40550C-1.5D	★	Square	4	5.5	6	8.3	10.3	50	-
GSX40600C-1.5D	★	Square	4	6.0	6	9.0	-	50	-
GSX40700C-1.5D	★	Square	4	7.0	8	11.0	13.0	60	-
GSX40800C-1.5D	★	Square	4	8.0	8	12.0	-	60	-
GSX40900C-1.5D	★	Square	4	9.0	10	14.0	16.0	70	-
GSX41000C-1.5D	★	Square	4	10.0	10	15.0	-	70	-
GSX41200C-1.5D	★	Square	4	12.0	12	18.0	-	75	-



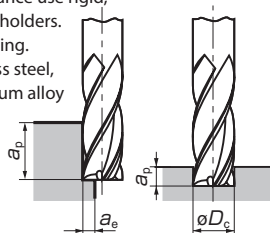
Endmill Identification (GSX MILL Series Only)

GSX 4 0100 C - 1.5D

1 Series Code 2 No. of Teeth 3 Diameter x 100 4 Cutting Edge 5 Cutting Length

Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Side Milling

★ - World Wide Warehouse Item

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	24,000	470	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	120	10,500	85
2.0	12,800	570	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	160	6,000	110
4.0	6,800	730	6,800	730	6,800	730	6,400	490	4,400	300	3,200	200	3,800	210	3,200	130
6.0	4,600	780	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	220	2,200	150
8.0	3,400	780	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	220	1,600	150
10.0	2,800	780	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,500	220	1,300	150
12.0	2,300	780	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	220	1,100	150
16.0	1,700	650	1,700	650	1,700	650	1,600	420	1,100	280	800	170	1,000	180	800	120
20.0	1,350	600	1,350	600	1,350	600	1,300	380	900	260	650	150	800	160	650	100
Standard Depth-of-cut	1.5D _c								1.0D _c							
ae	0.05D _c								0.02D _c							

Side Milling (High Speed Machining Center)

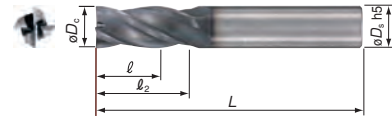
Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	60,000	1,200	60,000	1,200	60,000	1,200	60,000	850	60,000	720	48,000	500	32,000	300	-	-
2.0	47,800	2,200	47,800	2,200	47,800	2,200	47,800	1,600	39,800	1,200	31,800	900	15,900	400	-	-
4.0	23,900	2,600	23,900	2,600	23,900	2,600	23,900	1,900	19,900	1,400	15,900	1,100	8,000	490	-	-
6.0	16,000	2,700	16,000	2,700	16,000	2,700	16,000	2,000	13,300	1,500	10,600	1,200	5,300	520	-	-
8.0	12,000	2,700	12,000	2,700	12,000	2,700	12,000	2,000	10,000	1,500	8,000	1,200	4,000	520	-	-
10.0	9,600	2,700	9,600	2,700	9,600	2,700	9,600	2,000	8,000	1,500	6,400	1,200	3,200	520	-	-
12.0	8,000	2,700	8,000	2,700	8,000	2,700	8,000	2,000	6,700	1,500	5,300	1,200	2,700	520	-	-
16.0	6,000	2,200	6,000	2,200	6,000	2,200	6,000	1,600	5,000	1,200	4,000	900	2,000	450	-	-
20.0	4,800	2,000	4,800	2,000	4,800	2,000	4,800	1,400	4,000	1,100	3,200	750	1,600	380	-	-
Standard Depth-of-cut	1.5D _c								1.0D _c							
ae	0.05D _c								0.02D _c							

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy			
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		
1.0	24,000	380	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	85	5,200	30		
2.0	12,800	460	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	110	3,000	40		
4.0	6,800	580	6,800	730	6,800	730	5,400	490	4,400	300	3,200	200	3,800	130	1,600	55		
6.0	4,600	620	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	160	1,100	65		
8.0	3,400	620	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	160	800	65		
10.0	2,800	620	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,600	160	650	65		
12.0	2,300	620	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	160	550	65		
16.0	1,700	520	1,700	560	1,700	560	1,600	420	1,100	280	800	170	1,000	130	400	55		
20.0	1,350	480	1,350	600	1,350	600	1,300	380	900	260	650	150	800	110	320	50		
Standard Depth-of-cut	0.2D _c		0.5D _c				0.2D _c				0.05D _c				0.2D _c			

GSX End Mill-METRIC 2D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX40100C-2D	★	Square	4	1.0	4	2.0	3.0	40	-
GSX40150C-2D	★	Square	4	1.5	4	3.0	4.0	40	-
GSX40200C-2D	★	Square	4	2.0	4	4.0	5.0	40	-
GSX40250C-2D	★	Square	4	2.5	4	5.0	6.0	40	-
GSX40300C-2D	★	Square	4	3.0	6	6.0	7.5	45	-
GSX40350C-2D	★	Square	4	3.5	6	7.0	8.5	45	-
GSX40400C-2D	★	Square	4	4.0	6	8.0	9.5	45	-
GSX40450C-2D	★	Square	4	4.5	6	9.0	10.5	50	-
GSX40500C-2D	★	Square	4	5.0	6	10.0	12.0	50	-
GSX40550C-2D	★	Square	4	5.5	6	11.0	13.0	50	-
GSX40600C-2D	★	Square	4	6.0	6	12.0	-	50	-
GSX40700C-2D	★	Square	4	7.0	8	14.0	16.0	60	-
GSX40800C-2D	★	Square	4	8.0	8	16.0	-	60	-
GSX40900C-2D	★	Square	4	9.0	10	18.0	20.0	70	-
GSX41000C-2D	★	Square	4	10.0	10	20.0	-	70	-
GSX41200C-2D	★	Square	4	12.0	12	24.0	-	75	-
GSX41600C-2D	★	Square	4	16.0	16	32.0	-	90	-
GSX42000C-2D	★	Square	4	20.0	20	40.0	-	100	-
GSX42500C-2D	★	Square	4	25.0	25	50.0	-	120	-



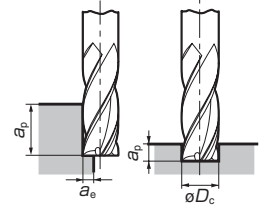
■ Endmill Identification (GSX MILL Series Only)

GSX 4 0100 C - 2D

Series Code	No. of Teeth	Diameter (mm)	Cutting Edge (mm)	Cutting Length (mm)
1	2	3	4	5
		x 100	Edge	Length
		(10mm x 100 = 1000)		

■ Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



■ Side Milling

★ - World Wide Warehouse Item

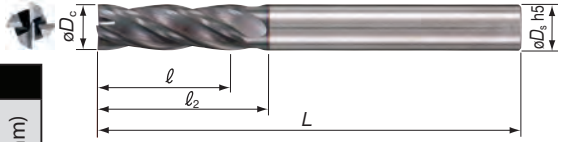
Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	24,000	470	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	120	10,500	85
2.0	12,800	570	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	160	6,000	110
4.0	6,800	730	6,800	730	6,800	730	6,400	490	4,400	300	3,200	200	3,800	210	3,200	130
6.0	4,600	780	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	220	2,200	150
8.0	3,400	780	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	220	1,600	150
10.0	2,800	780	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,500	220	1,300	150
12.0	2,300	780	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	220	1,100	150
16.0	1,700	650	1,700	650	1,700	650	1,600	420	1,100	280	800	170	1,000	180	800	120
20.0	1,350	600	1,350	600	1,350	600	1,300	380	900	260	650	150	800	160	650	100
25.0	1,000	480	1,000	480	1,000	480	1,000	300	700	200	500	120	640	120	500	80
Standard Depth-of-cut	ap															
	ae															

■ Side Milling (High Speed Machining Center)

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	60,000	1,200	60,000	1,200	60,000	1,200	60,000	850	60,000	720	48,000	500	32,000	300	Q	Q
2.0	47,800	2,200	47,800	2,200	47,800	2,200	47,800	1,600	39,800	1,200	31,800	900	15,900	400	Q	Q
4.0	23,900	2,600	23,900	2,600	23,900	2,600	23,900	1,900	19,900	1,400	15,900	1,100	8,000	490	Q	Q
6.0	16,000	2,700	16,000	2,700	16,000	2,700	16,000	2,000	13,300	1,500	10,600	1,200	5,300	520	Q	Q
8.0	12,000	2,700	12,000	2,700	12,000	2,700	12,000	2,000	10,000	1,500	8,000	1,200	4,000	520	Q	Q
10.0	9,600	2,700	9,600	2,700	9,600	2,700	9,600	2,000	8,000	1,500	6,400	1,200	3,200	520	Q	Q
12.0	8,000	2,700	8,000	2,700	8,000	2,700	8,000	2,000	6,700	1,500	5,300	1,200	2,700	520	Q	Q
16.0	6,000	2,200	6,000	2,200	6,000	2,200	6,000	1,600	5,000	1,200	4,000	900	2,000	450	Q	Q
20.0	4,800	2,000	4,800	2,000	4,800	2,000	4,800	1,400	4,000	1,100	3,200	750	1,600	380	Q	Q
25.0	3,800	1,500	3,800	1,500	3,800	1,500	3,800	1,100	3,200	900	2,500	600	1,300	300	Q	Q
Standard Depth-of-cut	ap															
	ae															

■ Groove Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	24,000	380	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	85	5,200	30
2.0	12,800	460	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	110	3,000	40
4.0	6,800	580	6,800	730	6,800	730	6,400	490	4,400	300	3,200	200	3,800	130	1,600	55
6.0	4,600	620	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	160	1,100	65
8.0	3,400	620	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	160	800	65
10.0	2,800	620	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,600	160	650	65
12.0	2,300	620	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	160	550	65
16.0	1,700	520	1,700	560	1,700	560	1,600	420	1,100	280	800	170	1,000	130	400	55
20.0	1,350	480	1,350	600	1,350	600	1,300	380	900	260	650	150	800	110	320	50
25.0	1,000	380	1,000	450	1,000	450	1,000	300	700	200	500	120	640	80	250	40
Standard Depth-of-cut	ap															
		0.2Dc				0.5Dc				0.2Dc		0.05Dc			0.2Dc	



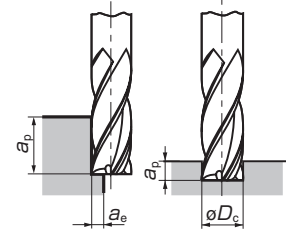
GSX End Mill-METRIC 3D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX40100C-3D	★	Square	4	1.0	4	3.0	4.0	40	-
GSX40150C-3D	★	Square	4	1.5	4	4.5	5.5	40	-
GSX40200C-3D	★	Square	4	2.0	4	6.0	7.0	40	-
GSX40250C-3D	★	Square	4	2.5	4	7.5	8.5	40	-
GSX40300C-3D	★	Square	4	3.0	6	9.0	10.5	50	-
GSX40400C-3D	★	Square	4	4.0	6	12.0	13.5	50	-
GSX40500C-3D	★	Square	4	5.0	6	15.0	17.0	50	-
GSX40600C-3D	★	Square	4	6.0	6	18.0	-	50	-
GSX40800C-3D	★	Square	4	8.0	8	24.0	-	70	-
GSX41000C-3D	★	Square	4	10.0	10	30.0	-	90	-
GSX41200C-3D	★	Square	4	12.0	12	36.0	-	90	-
GSX41600C-3D	★	Square	4	16.0	16	48.0	-	110	-

★ - World Wide Warehouse Item

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSX MILL Series Only)

GSX 4 0100 C - 3D

1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Edge Length
		(10mm x 100 = 1000)	S: Sharp Edge C: Gash Land	

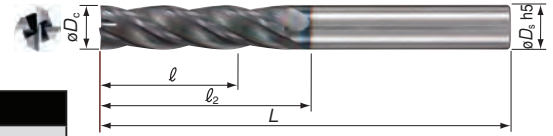
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy					
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)				
1.0	21,000	360	21,000	360	21,000	360	19,000	220	13,000	140	9,000	90	10,500	90	9,000	65				
2.0	10,500	360	10,500	360	10,500	360	9,600	290	7,500	180	4,500	110	5,200	120	4,500	85				
4.0	5,200	500	5,200	500	5,200	500	4,800	370	4,000	280	2,250	150	2,600	160	2,250	100				
6.0	3,500	560	3,500	560	3,500	560	3,200	400	2,700	300	1,500	160	1,700	170	1,500	120				
8.0	2,600	520	2,600	520	2,600	520	2,400	400	2,000	300	1,100	160	1,300	170	1,100	120				
10.0	2,100	500	2,100	500	2,100	500	1,900	400	1,600	300	900	160	1,000	160	900	120				
12.0	1,750	500	1,750	500	1,750	500	1,600	400	1,350	300	750	150	850	160	750	120				
16.0	1,300	420	1,300	420	1,300	420	1,200	330	1,000	260	550	120	650	140	550	100				
20.0	1,050	380	1,050	380	1,050	380	950	290	800	230	450	110	500	120	450	90				
Standard Depth-of-cut	a_p										$2.5D_c$		$2.0D_c$							
	a_e										Below $\phi 3$: $0.05D_c$ From $\phi 3$ to below $\phi 8$: $0.1D_c$ $\phi 8$ and above: $0.15D_c$					$0.02D_c$				

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	16,600	140	16,600	140	16,600	140	15,500	100	10,500	100	7,500	70	9,400	60	3,750	20
2.0	9,500	160	9,500	160	9,500	160	9,000	180	6,200	120	4,500	90	5,200	80	2,250	30
4.0	5,200	160	5,200	180	5,200	180	4,800	160	3,400	110	2,200	65	2,600	70	1,250	25
6.0	3,500	160	3,500	200	3,500	200	3,200	160	2,550	120	1,500	65	1,700	70	950	25
8.0	2,600	160	2,600	200	2,600	200	2,400	160	1,900	120	1,100	65	1,300	70	700	25
10.0	2,100	160	2,100	200	2,100	200	1,900	160	1,500	120	900	65	1,000	70	550	25
12.0	1,750	160	1,750	200	1,750	200	1,600	160	1,250	120	750	65	850	70	450	25
16.0	1,300	160	1,300	200	1,300	200	1,200	160	950	120	550	65	650	70	350	25
20.0	1,050	160	1,050	200	1,050	200	950	160	750	120	450	65	500	70	280	25
Standard Depth-of-cut	a_p		$0.1D_c$		$0.2D_c$		$0.05D_c$		$0.1D_c$		$0.05D_c$		$0.1D_c$		$0.1D_c$	





GSX End Mill-METRIC 4D Gash Land									
ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) l	Neck Length (mm) l_2	OAL (mm) L	Corner Radius (mm)
GSX40100C-4D	★	Square	4	1.0	4	4.0	5.0	40	-
GSX40150C-4D	★	Square	4	1.5	4	6.0	7.0	40	-
GSX40200C-4D	★	Square	4	2.0	4	8.0	9.0	40	-
GSX40250C-4D	★	Square	4	2.5	4	10.0	11.0	50	-
GSX40300C-4D	★	Square	4	3.0	6	12.0	13.5	50	-
GSX40400C-4D	★	Square	4	4.0	6	16.0	17.5	50	-
GSX40500C-4D	★	Square	4	5.0	6	20.0	22.0	60	-
GSX40600C-4D	★	Square	4	6.0	6	24.0	-	60	-
GSX40800C-4D	★	Square	4	8.0	8	32.0	-	80	-
GSX41000C-4D	★	Square	4	10.0	10	40.0	-	90	-
GSX41200C-4D	★	Square	4	12.0	12	48.0	-	100	-
GSX41600C-4D	★	Square	4	16.0	16	64.0	-	120	-

★ - World Wide Warehouse Item

■ Endmill Identification (GSXMILL Series Only)

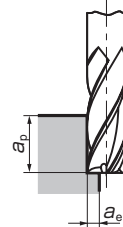
GSX 4 0100 C - 4D

1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Edge Length
GSX	4	0100	C	4D

(10mm x 100 = 1000) S: Sharp Edge
C: Gash Land

■ Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- This series is not recommended for grooving.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



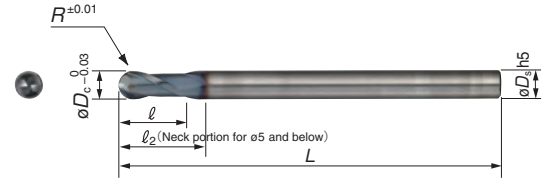
■ Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	9,000	140	9,000	140	9,000	140	7,000	80	6,500	60	4,500	40	5,400	40	4,500	40
2.0	4,500	140	4,500	140	4,500	140	3,500	100	3,200	80	2,300	55	2,700	55	2,300	40
4.0	2,250	200	2,250	200	2,250	200	1,750	120	1,600	100	1,200	60	1,350	50	1,200	35
6.0	1,500	250	1,500	250	1,500	250	1,150	160	1,050	140	800	65	900	45	800	35
8.0	1,100	220	1,100	220	1,100	220	850	160	800	130	600	65	660	45	600	35
10.0	900	210	900	210	900	210	700	140	650	120	460	65	540	45	460	35
12.0	750	200	750	200	750	200	580	140	520	110	400	65	450	45	400	35
16.0	550	170	550	170	550	170	440	120	400	95	300	55	330	45	300	35
20.0	450	150	450	150	450	150	350	100	320	80	240	50	270	45	240	35
Standard Depth-of-cut	a_p	3.5D _c										3.0D _c				
	a_e	Below $\phi 3$: 0.04D _c From $\phi 3$ to below $\phi 8$: 0.08D _c $\phi 8$ and above: 0.1D _c										0.02D _c				



GSX End Mill-METRIC BALLNOSE

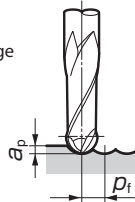
ITEM	Stock	Type	Flutes	Diam. (mm) ϕD_c	Shank Diam. (mm) ϕD_s	Flute Length (mm) ℓ	Neck Length (mm) ℓ_2	OAL (mm) L	Corner Radius (mm)
GSXB20020	○	Ballnose	2	0.4	4	0.6	0.8	50	0.20
GSXB20030	○	Ballnose	2	0.6	4	0.9	1.2	50	0.30
GSXB20050	○	Ballnose	2	1.0	4	1.5	2.0	50	0.50
GSXB20075	○	Ballnose	2	1.5	4	2.3	3.0	50	0.75
GSXB20100	○	Ballnose	2	2.0	6	3.0	4.0	60	1.00
GSXB20125	○	Ballnose	2	2.5	6	4.0	5.0	60	1.25
GSXB20150	○	Ballnose	2	3.0	6	4.5	6.0	60	1.50
GSXB20200	○	Ballnose	2	4.0	6	6.0	8.0	70	2.00
GSXB20250	○	Ballnose	2	5.0	6	7.5	10.0	80	2.50
GSXB20300	○	Ballnose	2	6.0	6	9.0	-	80	3.00
GSXB20350	○	Ballnose	2	7.0	8	11.0	20.0	90	3.50
GSXB20400	○	Ballnose	2	8.0	8	12.0	-	90	4.00
GSXB20500	○	Ballnose	2	10.0	10	15.0	-	100	5.00
GSXB20600	○	Ballnose	2	12.0	12	18.0	-	110	6.00
GSXB20700	○	Ballnose	2	14.0	16	21.0	38.0	110	7.00
GSXB20800	○	Ballnose	2	16.0	16	24.0	-	140	8.00
GSXB20900	○	Ballnose	2	18.0	20	27.0	50.0	140	9.00
GSXB21000	○	Ballnose	2	20.0	20	30.0	-	160	10.00



○ - Items Available 1st Quarter 2015

Recommended Cutting Conditions

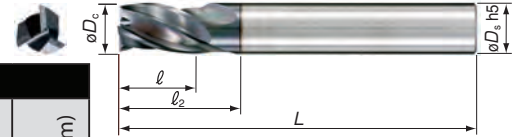
1. If cutting noise and vibration are present, please change the cutting conditions accordingly.
2. If the machine is not designed to achieve the recommended spindle speed, please use the max. spindle speed available.



Radius Milling

Work Material Cutting Conditions R(mm)	Carbon Steel, Alloy Steel (Below 25HRC)		Carbon Steel, Alloy Steel (Below 50HRC)		Cast Iron Special Cast Iron		Stainless Steel Titanium Alloy		
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
0.20	50,000	2,100	35,000	1,150	50,000	2,100	50,000	1,750	
0.30	50,000	2,500	35,000	1,350	50,000	2,500	50,000	2,100	
0.50	50,000	3,000	35,000	1,600	50,000	3,000	50,000	2,500	
0.75	35,000	3,000	24,000	1,650	35,000	3,200	34,000	2,500	
1.00	27,500	3,000	19,000	1,700	35,000	3,900	26,000	2,500	
1.25	22,500	3,000	15,500	1,700	28,000	3,900	21,000	2,500	
1.50	19,000	3,000	13,000	1,700	24,000	3,900	17,500	2,500	
2.00	17,000	3,800	12,000	2,100	20,000	4,100	15,000	2,700	
2.50	15,500	4,300	11,000	2,200	18,000	4,600	12,000	2,500	
3.00	14,000	4,700	10,500	2,500	16,500	5,300	10,500	2,500	
3.50	12,500	4,200	9,000	2,100	14,000	4,500	9,000	2,200	
4.00	11,000	3,500	7,900	1,900	12,500	4,000	7,800	1,900	
5.00	9,000	2,800	6,300	1,500	10,500	3,300	6,300	1,500	
6.00	7,500	2,400	5,200	1,250	8,700	2,800	5,200	1,250	
7.00	6,400	2,100	4,500	1,100	7,400	2,400	4,500	1,100	
8.00	5,600	1,800	3,900	950	6,500	2,100	3,900	950	
9.00	5,000	1,600	3,500	850	5,800	1,900	3,500	850	
10.00	4,500	1,450	3,100	750	5,200	1,700	3,150	750	
12.50	3,600	1,150	2,500	600	4,200	1,350	2,500	600	
Standard Depth-of-cut	a_p	0.02D _c		0.02D _c		0.02D _c		0.02D _c	
	p_f	0.05D _c		0.05D _c		0.05D _c		0.05D _c	





GSX End Mill-METRIC 1.5D Gash Land									
ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSX30100C-1.5D	★	Square	3	1.0	4	1.5	2.5	40	-
GSX30150C-1.5D	★	Square	3	1.5	4	2.3	3.3	40	-
GSX30200C-1.5D	★	Square	3	2.0	4	3.0	4.0	40	-
GSX30250C-1.5D	★	Square	3	2.5	4	3.8	4.8	40	-
GSX30300C-1.5D	★	Square	3	3.0	6	4.5	6.0	45	-
GSX30400C-1.5D	★	Square	3	4.0	6	6.0	7.5	45	-
GSX30500C-1.5D	★	Square	3	5.0	6	7.5	9.5	50	-
GSX30600C-1.5D	★	Square	3	6.0	6	9.0	-	50	-
GSX30700C-1.5D	★	Square	3	7.0	8	11.0	13.0	60	-
GSX30800C-1.5D	★	Square	3	8.0	8	12.0	-	60	-
GSX30900C-1.5D	★	Square	3	9.0	10	14.0	16.0	70	-
GSX31000C-1.5D	★	Square	3	10.0	10	15.0	-	70	-
GSX31200C-1.5D	★	Square	3	12.0	12	18.0	-	75	-

★ - World Wide Warehouse Item

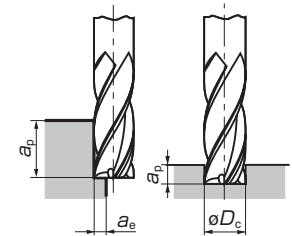
■ Endmill Identification (GSXMILL Series Only)

GSX 3 0100 C - 1.5D

1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Length

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



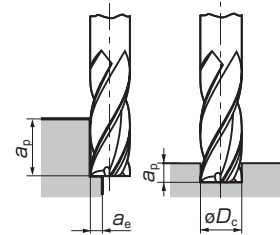
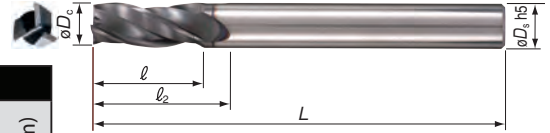
■ Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
1.0	19,600	300	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	90	9,000	65
2.0	11,200	410	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	120	5,300	90
4.0	6,400	550	6,400	550	6,400	550	6,400	370	4,200	230	3,000	140	3,600	150	3,000	120
6.0	4,600	670	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,700	180	2,200	130
8.0	3,400	670	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	180	1,600	130
10.0	2,800	670	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	180	1,300	130
12.0	2,300	670	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	180	1,100	130
16.0	1,700	550	1,700	550	1,700	550	1,600	370	1,100	230	800	140	1,000	150	800	100
20.0	1,350	490	1,350	490	1,350	490	1,300	330	900	210	650	120	800	130	650	90
Standard Depth-of-cut	1.5D _c						1.0D _c						0.02D _c			
	0.05D _c															

■ Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	D _c (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
1.0	19,600	240	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	65	4,500	25
2.0	11,200	320	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	85	2,650	35
4.0	6,400	450	6,400	550	6,400	550	6,400	370	4,200	230	3,000	140	3,600	100	1,500	50
6.0	4,600	540	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,650	130	1,150	55
8.0	3,400	540	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	130	800	55
10.0	2,800	540	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	130	650	55
12.0	2,300	540	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	130	500	55
16.0	1,700	440	1,700	550	1,700	550	1,600	370	1,100	230	800	140	1,000	110	400	45
20.0	1,350	390	1,350	490	1,350	490	1,300	330	900	210	650	120	800	90	320	40
Standard Depth-of-cut	0.2D _c		0.5D _c				0.2D _c				0.05D _c		0.2D _c			





GSX End Mill-METRIC 2D Gash Land

ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSX30100C-2D	★	Square	3	1.0	4	2.5	3.5	40	-
GSX30150C-2D	★	Square	3	1.5	4	3.8	4.8	40	-
GSX30200C-2D	★	Square	3	2.0	4	5.0	6.0	40	-
GSX30250C-2D	★	Square	3	2.5	4	6.3	7.3	40	-
GSX30300C-2D	★	Square	3	3.0	6	7.5	9.0	45	-
GSX30400C-2D	★	Square	3	4.0	6	11.0	12.5	45	-
GSX30500C-2D	★	Square	3	5.0	6	13.0	15.0	50	-
GSX30600C-2D	★	Square	3	6.0	6	13.0	-	50	-
GSX30700C-2D	★	Square	3	7.0	8	16.0	18.0	60	-
GSX30800C-2D	★	Square	3	8.0	8	19.0	-	60	-
GSX30900C-2D	★	Square	3	9.0	10	19.0	21.0	70	-
GSX31000C-2D	★	Square	3	10.0	10	22.0	-	70	-
GSX31200C-2D	★	Square	3	12.0	12	26.0	-	75	-

★ - World Wide Warehouse Item

Endmill Identification (GSXMILL Series Only)

GSX 3 0100 C - 2D

1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Edge Length

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy		
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
D _c (mm)	1.0	19,600	300	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	90	9,000	65
	2.0	11,200	410	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	120	5,300	90
	4.0	6,400	550	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	150	3,000	120
	6.0	4,600	670	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,700	180	2,200	130
	8.0	3,400	670	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	180	1,600	130
	10.0	2,800	670	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	180	1,300	130
	12.0	2,300	670	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	180	1,100	130
	16.0	1,700	550	1,700	550	1,700	550	1,600	370	1,100	230	800	140	1,000	150	800	100
	20.0	1,350	490	1,350	490	1,350	490	1,300	330	900	210	650	120	800	130	650	90
Standard Depth-of-cut a _p	1.5D _c											1.0D _c					
	0.05D _c											0.02D _c					

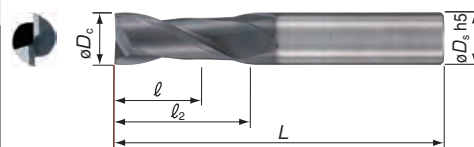
Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy		
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
D _c (mm)	1.0	19,600	240	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	65	4,500	25
	2.0	11,200	320	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	85	2,650	35
	4.0	6,400	450	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	100	1,500	50
	6.0	4,600	540	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,650	130	1,150	55
	8.0	3,400	540	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	130	800	55
	10.0	2,800	540	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	130	650	55
	12.0	2,300	540	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	130	500	55
	16.0	1,700	440	1,700	550	1,700	550	1,600	370	1,100	230	800	140	1,000	110	400	45
	20.0	1,350	390	1,350	490	1,350	490	1,300	330	900	210	650	120	800	90	320	40
Standard Depth-of-cut a _p	0.2D _c		0.5D _c				0.2D _c		0.05D _c		0.2D _c						

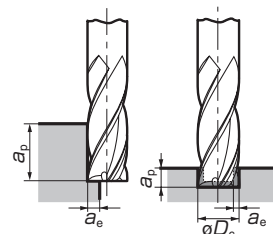


GSX End Mill-METRIC 2D Sharp Edge

ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)	Fig.
GSX20050S-2D	★	Square	2	0.5	4	1.3	1.7	40	-	
GSX20100S-2D	★	Square	2	1.0	4	2.5	3.5	40	-	
GSX20150S-2D	★	Square	2	1.5	4	3.8	4.8	40	-	
GSX20150S-2D-S3	★	Square	2	1.5	3	3.8	4.8	38	-	
GSX20200S-2D	★	Square	2	2.0	4	5.0	6.0	40	-	
GSX20200S-2D-S3	★	Square	2	2.0	3	5.0	6.0	38	-	
GSX20250S-2D	★	Square	2	2.5	4	6.3	7.3	40	-	
GSX20300S-2D	★	Square	2	3.0	6	7.5	9.0	45	-	
GSX20300S-2D-S3	★	Square	2	3.0	3	7.5	-	38	-	
GSX20350S-2D	★	Square	2	3.5	6	8.8	10.3	45	-	
GSX20400S-2D	★	Square	2	4.0	6	11.0	14.0	45	-	
GSX20400S-2D-S4	★	Square	2	4.0	4	11.0	-	45	-	
GSX20450S-2D	★	Square	2	4.5	6	11.3	12.8	50	-	
GSX20500S-2D	★	Square	2	5.0	6	13.0	19.6	50	-	
GSX20550S-2D	★	Square	2	5.5	6	13.0	19.6	50	-	
GSX20600S-2D	★	Square	2	6.0	6	13.0	-	50	-	
GSX20700S-2D	★	Square	2	7.0	8	16.0	21.1	60	-	
GSX20800S-2D	★	Square	2	8.0	8	19.0	-	60	-	
GSX20900S-2D	★	Square	2	9.0	10	19.0	24.1	70	-	
GSX21000S-2D	★	Square	2	10.0	10	22.0	-	70	-	
GSX21200S-2D	★	Square	2	12.0	12	26.0	-	75	-	
GSX21600S-2D	★	Square	2	16.0	16	32.0	-	90	-	
GSX22000S-2D	★	Square	2	20.0	20	40.0	-	100	-	



- Recommended Cutting Conditions
1. For stable machining performance use rigid, high-precision machines and holders.
 2. Use air blow when dry machining.
 3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
 4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
 5. This series is not recommended for groove milling.
 6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



■ Endmill Identification (GSXMILL Series Only)

★ - World Wide Warehouse Item

GSX 2 0150 S - 2D - S3

1 Series Code 2 No. of Teeth 3 Diameter x 100 4 Cutting Edge 5 Cutting Length 6 Shank Diameter

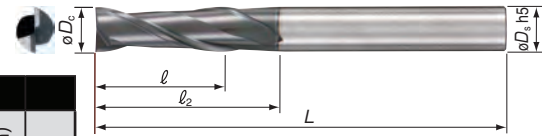
■ Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm)																
1.0	16,600	180	16,600	180	16,600	180	15,500	130	10,500	70	7,500	45	9,400	50	7,500	35
2.0	9,500	250	9,500	250	9,500	250	9,000	200	6,200	100	4,500	60	5,400	70	4,500	50
4.0	5,400	330	5,400	330	5,400	330	5,000	250	3,400	120	2,500	75	3,000	90	2,500	65
6.0	4,000	400	4,000	400	4,000	400	3,700	300	2,550	150	1,900	100	2,300	110	1,900	80
8.0	3,000	400	3,000	400	3,000	400	2,800	300	1,900	150	1,400	100	1,700	110	1,400	80
10.0	2,400	400	2,400	400	2,400	400	2,200	300	1,500	150	1,100	100	1,300	110	1,100	80
12.0	2,000	400	2,000	400	2,000	400	1,850	300	1,300	150	950	100	1,100	110	950	80
16.0	1,500	330	1,500	330	1,500	330	1,400	250	950	120	700	75	850	85	700	60
20.0	1,200	280	1,200	280	1,200	280	1,100	220	750	110	550	65	650	75	550	55
Standard Depth-of-cut	a _p		a _e		0.02D _c		2.0D _c		0.01D _c		0.01D _c					

■ Groove Finishing

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm)																
1.0	16,600	180	16,600	180	16,600	180	15,500	130	10,500	70	7,500	45	9,400	50	7,500	35
2.0	9,500	250	9,500	250	9,500	250	9,000	200	6,200	100	4,500	60	5,400	70	4,500	50
4.0	5,400	330	5,400	330	5,400	330	5,000	250	3,400	120	2,500	75	3,000	90	2,500	65
6.0	4,000	400	4,000	400	4,000	400	3,700	300	2,550	150	1,900	100	2,300	110	1,900	80
8.0	3,000	400	3,000	400	3,000	400	2,800	300	1,900	150	1,400	100	1,700	110	1,400	80
10.0	2,400	400	2,400	400	2,400	400	2,200	300	1,500	150	1,100	100	1,300	110	1,100	80
12.0	2,000	400	2,000	400	2,000	400	1,850	300	1,300	150	950	100	1,100	110	950	80
16.0	1,500	330	1,500	330	1,500	330	1,400	250	950	120	700	75	850	85	700	60
20.0	1,200	280	1,200	280	1,200	280	1,100	220	750	110	550	65	650	75	550	55
Standard Depth-of-cut	a _p		a _e		1.5D _c		0.02D _c Max.									



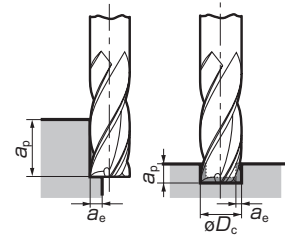


GSX End Mill-METRIC 3D Sharp Edge

ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)	Fig.
GSX20050S-3D	★	Square	2	0.5	4	1.5	1.9	40	-	
GSX20100S-3D	★	Square	2	1.0	4	3.0	4.0	40	-	
GSX20150S-3D	★	Square	2	1.5	4	4.5	5.5	40	-	
GSX20200S-3D	★	Square	2	2.0	4	6.0	7.0	40	-	
GSX20250S-3D	★	Square	2	2.5	4	7.5	8.5	40	-	
GSX20300S-3D	★	Square	2	3.0	6	9.0	10.5	50	-	
GSX20400S-3D	★	Square	2	4.0	6	12.0	13.5	50	-	
GSX20500S-3D	★	Square	2	5.0	6	15.0	17.0	50	-	
GSX20600S-3D	★	Square	2	6.0	6	18.0	-	50	-	
GSX20800S-3D	★	Square	2	8.0	8	24.0	-	70	-	
GSX21000S-3D	★	Square	2	10.0	10	30.0	-	90	-	
GSX21200S-3D	★	Square	2	12.0	12	36.0	-	90	-	
GSX21600S-3D	★	Square	2	16.0	16	48.0	-	110	-	

Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- This series is not recommended for grooving.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



★ - World Wide Warehouse Item

Endmill Identification (GSXMILL Series Only)

GSX 2 0050 S - 3D

1	2	3	4	5
Series Code	No. of Teeth x 100	Diameter (mm)	Cutting Edge	Cutting Edge Length
	(10mm x 100 = 1000)		♠: Sharp Edge	♣: Gash Land

Side Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	14,000	140	14,000	140	14,000	140	13,200	100	8,900	50	6,300	30	8,000	35	6,300	25
2.0	8,100	180	8,100	180	8,100	180	7,600	150	5,300	90	3,700	45	4,400	50	3,800	40
4.0	4,400	240	4,400	240	4,400	240	4,000	150	2,900	110	1,900	55	2,200	65	1,900	50
6.0	2,900	260	2,900	260	2,900	260	2,700	180	2,100	130	1,200	65	1,400	75	1,200	60
8.0	2,200	230	2,200	230	2,200	230	2,000	180	1,600	130	900	65	1,100	75	900	60
10.0	1,800	220	1,800	220	1,800	220	1,600	170	1,300	130	750	65	850	75	750	60
12.0	1,500	200	1,500	200	1,500	200	1,300	170	1,000	130	630	65	700	75	600	60
16.0	1,100	170	1,100	170	1,100	170	1,000	150	800	110	450	55	550	65	450	50
20.0	850	160	850	160	850	160	800	130	600	100	350	50	400	55	350	45
Standard Depth-of-cut	2.5D _c								2.0D _c							
	Below ø3-0.02D _c , ø3 and above 0.05D _c								0.01D _c							

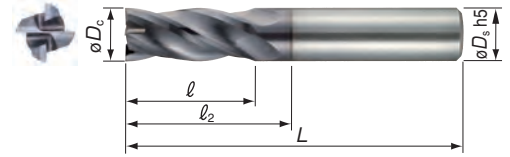
Groove Milling

Work Material	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	14,000	140	14,000	140	14,000	140	13,200	100	8,900	50	6,300	30	8,000	35	6,300	25
2.0	8,100	180	8,100	180	8,100	180	7,600	150	5,300	90	3,700	45	4,400	50	3,800	40
4.0	4,400	240	4,400	240	4,400	240	4,000	150	2,900	110	1,900	55	2,200	65	1,900	50
6.0	2,900	260	2,900	260	2,900	260	2,700	180	2,100	130	1,200	65	1,400	75	1,200	60
8.0	2,200	230	2,200	230	2,200	230	2,000	180	1,600	130	900	65	1,100	75	900	60
10.0	1,800	220	1,800	220	1,800	220	1,600	170	1,300	130	750	65	850	75	750	60
12.0	1,500	200	1,500	200	1,500	200	1,300	170	1,000	130	630	65	700	75	600	60
16.0	1,100	170	1,100	170	1,100	170	1,000	150	800	110	450	55	550	65	450	50
20.0	850	160	850	160	850	160	800	130	600	100	350	50	400	55	350	45
Standard Depth-of-cut	0.02D _c Max.															



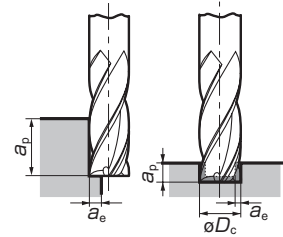
GSX End Mill-METRIC 2D Sharp Edge

ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSX40100S-2D	★	Square	4	1.0	4	2.5	3.5	40	-
GSX40100S-2D-S3	★	Square	4	1.0	3	2.5	3.5	38	-
GSX40150S-2D	★	Square	4	1.5	4	3.8	4.8	40	-
GSX40200S-2D	★	Square	4	2.0	4	5.0	6.0	40	-
GSX40200S-2D-S3	★	Square	4	2.0	3	5.0	6.0	38	-
GSX40250S-2D	★	Square	4	2.5	4	6.3	7.3	40	-
GSX40300S-2D	★	Square	4	3.0	6	7.5	9.0	45	-
GSX40300S-2D-S3	★	Square	4	3.0	3	7.5	-	38	-
GSX40350S-2D	★	Square	4	3.5	6	8.8	10.0	45	-
GSX40400S-2D	★	Square	4	4.0	6	11.0	14.0	45	-
GSX40400S-2D-S4	★	Square	4	4.0	4	11.0	-	45	-
GSX40450S-2D	★	Square	4	4.5	6	11.3	12.8	50	-
GSX40500S-2D	★	Square	4	5.0	6	13.0	19.6	50	-
GSX40550S-2D	★	Square	4	5.5	6	13.0	19.6	50	-
GSX40600S-2D	★	Square	4	6.0	6	13.0	-	50	-
GSX40700S-2D	★	Square	4	7.0	8	16.0	21.1	60	-
GSX40800S-2D	★	Square	4	8.0	8	19.0	-	60	-
GSX40900S-2D	★	Square	4	9.0	10	19.0	24.1	70	-
GSX41000S-2D	★	Square	4	10.0	10	22.0	-	70	-
GSX41200S-2D	★	Square	4	12.0	12	26.0	-	75	-
GSX41600S-2D	★	Square	4	16.0	16	32.0	-	90	-
GSX42000S-2D	★	Square	4	20.0	20	40.0	-	100	-



Recommended Cutting Conditions

- For stable machining performance use rigid, high-precision machines and holders.
- Use air blow when dry machining.
- Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
- If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
- This series is not recommended for groove milling.
- If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Endmill Identification (GSXMILL Series Only)

★ - World Wide Warehouse Item

GSX 4 0100 S - 2D - S3

1	2	3	4	5	6
Series Code	No. of Teeth	Diameter (10mm x 100 = 1000)	Cutting Edge	Cutting Edge Length	Shank Diameter
GSX40100S-2D-S3	4	1000	Square	25	4

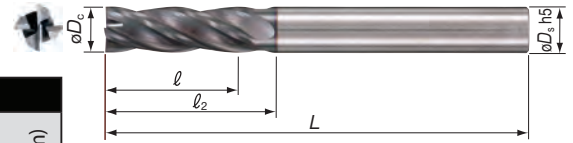
Side Milling

Work Material	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	22,000	360	22,000	360	22,000	360	19,000	220	13,000	140	9,500	90	11,300	90	9,500	65
2.0	11,500	440	11,500	440	11,500	440	11,000	290	7,500	180	5,400	110	6,500	120	5,400	85
4.0	6,000	560	6,000	560	6,000	560	5,800	370	4,000	230	2,900	150	3,400	160	2,900	100
6.0	4,200	600	4,200	600	4,200	600	4,000	400	2,700	240	2,000	160	2,400	170	2,000	120
8.0	3,000	600	3,000	600	3,000	600	2,800	400	2,000	240	1,450	160	1,800	170	1,450	120
10.0	2,500	600	2,500	600	2,500	600	2,350	400	1,600	240	1,200	160	1,450	170	1,200	120
12.0	2,100	600	2,100	600	2,100	600	2,000	400	1,350	240	1,000	160	1,200	170	1,000	120
16.0	1,500	500	1,500	500	1,500	500	1,450	320	1,000	210	750	130	900	140	750	90
20.0	1,200	460	1,200	460	1,200	460	1,150	290	800	200	600	110	700	120	600	75
Standard Depth-of-cut	ap		ae		0.03Dc				2.0Dc				0.01Dc			

Groove Finishing

Work Material	Structural Steel SS		Carbon Steel SC 150 to 250HB		Cast Iron FC		Alloy Steel SCM 25 to 35HRC		Tempered Steel, Hardened Steel NAK, HPM 35 to 45HRC		Hardened Steel 45 to 55HRC		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	22,000	360	22,000	360	22,000	360	19,000	220	13,000	140	9,500	90	11,300	90	9,500	65
2.0	11,500	440	11,500	440	11,500	440	11,000	290	7,500	180	5,400	110	6,500	120	5,400	85
4.0	6,000	560	6,000	560	6,000	560	5,800	370	4,000	230	2,900	150	3,400	160	2,900	100
6.0	4,200	600	4,200	600	4,200	600	4,000	400	2,700	240	2,000	160	2,400	170	2,000	120
8.0	3,000	600	3,000	600	3,000	600	2,800	400	2,000	240	1,450	160	1,800	170	1,450	120
10.0	2,500	600	2,500	600	2,500	600	2,350	400	1,600	240	1,200	160	1,450	170	1,200	120
12.0	2,100	600	2,100	600	2,100	600	2,000	400	1,350	240	1,000	160	1,200	170	1,000	120
16.0	1,500	500	1,500	500	1,500	500	1,450	320	1,000	210	750	130	900	140	750	90
20.0	1,200	460	1,200	460	1,200	460	1,150	290	800	200	600	110	700	120	600	75
Standard Depth-of-cut	ap		ae		1.5Dc				Below 0.02Dc							





GSX End Mill-METRIC 3D Sharp Edge

ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSX40100S-3D	★	Square	4	1.0	4	3.0	4.0	40	-
GSX40200S-3D	★	Square	4	2.0	4	6.0	7.0	40	-
GSX40300S-3D	★	Square	4	3.0	6	9.0	10.5	50	-
GSX40400S-3D	★	Square	4	4.0	6	12.0	13.5	50	-
GSX40500S-3D	★	Square	4	5.0	6	15.0	17.0	50	-
GSX40600S-3D	★	Square	4	6.0	6	18.0	-	50	-
GSX40700S-3D	★	Square	4	7.0	8	21.0	23.0	70	-
GSX40800S-3D	★	Square	4	8.0	8	24.0	-	70	-
GSX41000S-3D	★	Square	4	10.0	10	30.0	-	90	-
GSX41200S-3D	★	Square	4	12.0	12	36.0	-	90	-
GSX41600S-3D	★	Square	4	16.0	16	48.0	-	110	-

★ - World Wide Warehouse Item

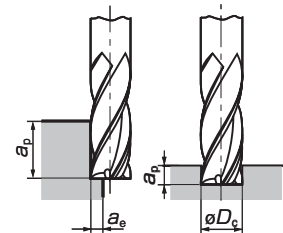
Endmill Identification (GSXMILL Series Only)

GSX 4 0100 S - 3D

1 Series 2 No. of Teeth 3 Diameter (10mm x 100 = 1000) 4 Cutting Edge 5 Cutting Length

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



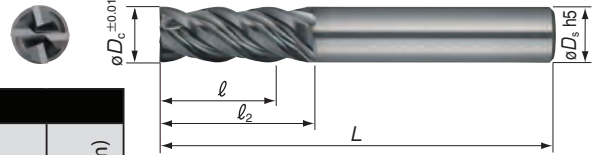
Side Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	18,500	250	18,500	250	18,500	250	17,000	150	11,500	100	8,000	65	9,400	65	8,000	45
2.0	9,400	250	9,400	250	9,400	250	8,500	200	6,700	130	4,000	65	4,600	90	4,000	60
4.0	4,500	350	4,500	350	4,500	350	4,300	250	3,500	210	2,000	110	2,300	110	2,000	70
6.0	3,100	400	3,100	400	3,100	400	2,800	300	2,400	220	1,300	120	1,500	120	1,300	90
8.0	2,300	380	2,300	380	2,300	380	2,100	300	1,800	220	950	120	1,100	120	900	90
10.0	1,800	350	1,800	350	1,800	350	1,700	300	1,400	220	700	120	900	120	800	90
12.0	1,500	350	1,500	350	1,500	350	1,400	300	1,200	220	650	110	750	120	650	90
16.0	1,100	300	1,100	300	1,100	300	1,000	240	900	190	480	90	550	100	490	70
20.0	900	280	900	280	900	280	850	210	700	170	400	80	440	90	400	60
Standard Depth-of-cut	2.5D _c								2.0D _c							
	Below ø3: 0.02D _c From ø3 to below ø8: 0.05D _c ø8 and above: 0.07D _c								0.01D _c							

Groove Milling

Work Material Cond.	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304, SUS316		Heat Resistant Steel Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	18,500	250	18,500	250	18,500	250	17,000	150	11,500	100	8,000	65	9,400	65	8,000	45
2.0	9,400	250	9,400	250	9,400	250	8,500	200	6,700	130	4,000	65	4,600	90	4,000	60
4.0	4,500	350	4,500	350	4,500	350	4,300	250	3,500	210	2,000	110	2,300	110	2,000	70
6.0	3,100	400	3,100	400	3,100	400	2,800	300	2,400	220	1,300	120	1,500	120	1,300	90
8.0	2,300	380	2,300	380	2,300	380	2,100	300	1,800	220	950	120	1,100	120	900	90
10.0	1,800	350	1,800	350	1,800	350	1,700	300	1,400	220	700	120	900	120	800	90
12.0	1,500	350	1,500	350	1,500	350	1,400	300	1,200	220	650	110	750	120	650	90
16.0	1,100	300	1,100	300	1,100	300	1,000	240	900	190	480	90	550	100	490	70
20.0	900	280	900	280	900	280	850	210	700	170	400	80	440	90	400	60
Standard Depth-of-cut	0.02D _c Max.															

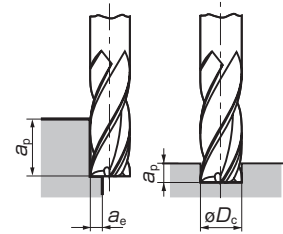




GSX End Mill-METRIC 2D Anti-vibration Type									
ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSXVL4020-2.5D	★	Square	4	2.0	4	5.0	6.5	50	-
GSXVL4030-2.5D	★	Square	4	3.0	6	8.0	9.5	50	-
GSXVL4040-2.5D	★	Square	4	4.0	6	10.0	11.5	50	-
GSXVL4050-2.5D	★	Square	4	5.0	6	13.0	14.5	60	-
GSXVL4060-2.5D	★	Square	4	6.0	6	15.0	-	60	-
GSXVL4070-2.5D	★	Square	4	7.0	8	18.0	20.0	70	-
GSXVL4080-2.5D	★	Square	4	8.0	8	20.0	-	80	-
GSXVL4090-2.5D	★	Square	4	9.0	10	23.0	25.0	90	-
GSXVL4100-2.5D	★	Square	4	10.0	10	25.0	-	90	-
GSXVL4110-2.5D	★	Square	4	11.0	12	28.0	30.5	90	-
GSXVL4120-2.5D	★	Square	4	12.0	12	30.0	-	90	-
GSXVL4140-2.5D	★	Square	4	14.0	16	35.0	37.5	110	-
GSXVL4150-2.5D	★	Square	4	15.0	16	38.0	41.0	110	-
GSXVL4160-2.5D	★	Square	4	16.0	16	40.0	-	115	-
GSXVL4180-2.5D	★	Square	4	18.0	20	45.0	48.0	120	-
GSXVL4200-2.5D	★	Square	4	20.0	20	50.0	-	125	-
GSXVL4250-2.5D	★	Square	4	25.0	25	63.0	-	140	-

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



★ - World Wide Warehouse Item

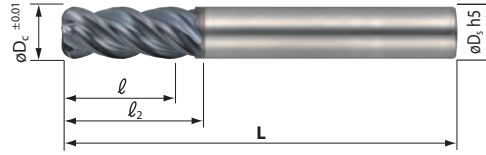
Side Milling

Work Material Cond.	Carbon Steel Cast Iron SS, SC, FC (150 to 250HB)		Cast Iron (25 to 35HRC)		Tempered Steel Hardened Steel NAK HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm) 2.0	13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0	9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0	6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0	5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0	4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0	3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0	3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0	2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0	2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0	2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0	1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth-of-cut a _p	1.5D _c		1.5D _c		1.5D _c		1.5D _c		1.5D _c	
a _e	0.2D _c		0.2D _c		0.05D _c		0.1D _c		0.05D _c	

Groove Milling

Work Material Cond.	Carbon Steel Cast Iron SS, SC, FC (150 to 250HB)		Cast Iron (25 to 35HRC)		Tempered Steel Hardened Steel NAK HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm) 2.0	13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0	8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0	6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0	4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0	3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0	3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0	2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0	2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0	2,000	620	1,300	380	1,100	330	900	200	430	80
20.0	1,900	600	1,200	360	1,000	320	800	180	380	70
25.0	1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth-of-cut a _p	1.0D _c		1.0D _c		0.2D _c		0.5D _c		0.2D _c	





GSX End Mill-METRIC Anti-vibration Type

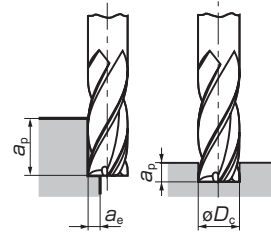
ITEM	Stock	Type	Flutes	Diam. (mm)	Shank Diam. (mm)	Flute Length (mm)	Neck Length (mm)	OAL (mm)	Corner Radius (mm)
GSXVL4030-R02-2.5D	★	Radius	4	3.0	6	8.0	9.5	50	0.2
GSXVL4030-R05-2.5D	★	Radius	4	3.0	6	8.0	9.5	50	0.5
GSXVL4040-R02-2.5D	★	Radius	4	4.0	6	10.0	11.5	50	0.2
GSXVL4040-R05-2.5D	★	Radius	4	4.0	6	10.0	11.5	50	0.5
GSXVL4040-R10-2.5D	★	Radius	4	4.0	6	10.0	11.5	50	1.0
GSXVL4050-R02-2.5D	★	Radius	4	5.0	6	13.0	14.5	60	0.2
GSXVL4050-R05-2.5D	★	Radius	4	5.0	6	13.0	14.5	60	0.5
GSXVL4050-R10-2.5D	★	Radius	4	5.0	6	13.0	14.5	60	1.0
GSXVL4060-R03-2.5D	★	Radius	4	6.0	6	15.0	-	60	0.3
GSXVL4060-R05-2.5D	★	Radius	4	6.0	6	15.0	-	60	0.5
GSXVL4060-R10-2.5D	★	Radius	4	6.0	6	15.0	-	60	1.0
GSXVL4060-R15-2.5D	★	Radius	4	6.0	6	15.0	-	60	1.5
GSXVL4080-R03-2.5D	★	Radius	4	8.0	8	20.0	-	80	0.3
GSXVL4080-R05-2.5D	★	Radius	4	8.0	8	20.0	-	80	0.5
GSXVL4080-R10-2.5D	★	Radius	4	8.0	8	20.0	-	80	1.0
GSXVL4080-R15-2.5D	★	Radius	4	8.0	8	20.0	-	80	1.5
GSXVL4080-R20-2.5D	★	Radius	4	8.0	8	20.0	-	80	2.0
GSXVL4100-R03-2.5D	★	Radius	4	10.0	10	25.0	-	90	0.3
GSXVL4100-R05-2.5D	★	Radius	4	10.0	10	25.0	-	90	0.5
GSXVL4100-R10-2.5D	★	Radius	4	10.0	10	25.0	-	90	1.0
GSXVL4100-R15-2.5D	★	Radius	4	10.0	10	25.0	-	90	1.5
GSXVL4100-R20-2.5D	★	Radius	4	10.0	10	25.0	-	90	2.0
GSXVL4120-R05-2.5D	★	Radius	4	12.0	12	30.0	-	90	0.5
GSXVL4120-R10-2.5D	★	Radius	4	12.0	12	30.0	-	90	1.0
GSXVL4120-R15-2.5D	★	Radius	4	12.0	12	30.0	-	90	1.5
GSXVL4120-R20-2.5D	★	Radius	4	12.0	12	30.0	-	90	2.0
GSXVL4120-R30-2.5D	★	Radius	4	12.0	12	30.0	-	90	3.0
GSXVL4160-R10-2.5D	★	Radius	4	16.0	16	40.0	-	115	1.0
GSXVL4160-R15-2.5D	★	Radius	4	16.0	16	40.0	-	115	1.5
GSXVL4160-R20-2.5D	★	Radius	4	16.0	16	40.0	-	115	2.0
GSXVL4160-R30-2.5D	★	Radius	4	16.0	16	40.0	-	115	3.0
GSXVL4200-R10-2.5D	★	Radius	4	20.0	20	50.0	-	125	1.0
GSXVL4200-R15-2.5D	★	Radius	4	20.0	20	50.0	-	125	1.5
GSXVL4200-R20-2.5D	★	Radius	4	20.0	20	50.0	-	125	2.0
GSXVL4200-R30-2.5D	★	Radius	4	20.0	20	50.0	-	125	3.0
GSXVL4250-R10-2.5D	★	Radius	4	25.0	25	63.0	-	140	1.0
GSXVL4250-R15-2.5D	★	Radius	4	25.0	25	63.0	-	140	1.5
GSXVL4250-R20-2.5D	★	Radius	4	25.0	25	63.0	-	140	2.0
GSXVL4250-R30-2.5D	★	Radius	4	25.0	25	63.0	-	140	3.0

★ - World Wide Warehouse Item



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



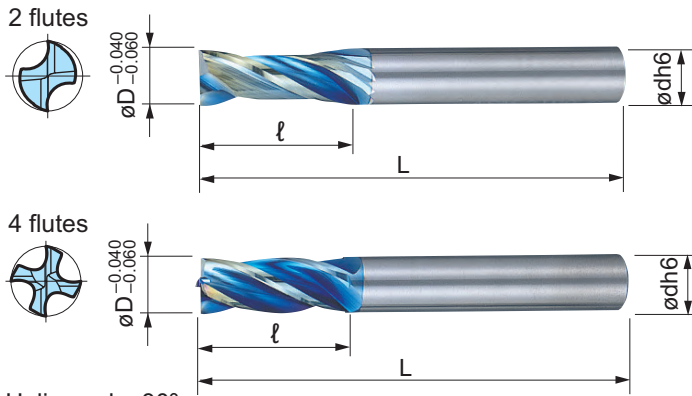
Side Milling

Work Material Cond.	Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Cast Iron (25 to 35HRC)		Tempered Steel Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm)										
2.0	13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0	9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0	6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0	5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0	4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0	3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0	3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0	2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0	2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0	2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0	1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth-of-cut	a _p		1.5D _c							
	a _e		0.2D _c		0.05D _c		0.1D _c		0.05D _c	

Groove Milling

Work Material Cond.	Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Cast Iron (25 to 35HRC)		Tempered Steel Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
D _c (mm)										
2.0	13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0	8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0	6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0	4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0	3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0	3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0	2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0	2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0	2,000	620	1,300	380	1,100	330	900	200	430	80
20.0	1,900	600	1,200	360	1,000	320	800	180	380	70
25.0	1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth-of-cut	a _p		1.0D _c		0.2D _c		0.5D _c		0.2D _c	





Helix angle: 30°
 Corner: Sharp edge
 Dia. Range: $\varnothing 2\sim 16\text{mm}$

Features & Benefits

- Very smooth AURORA COAT provides low adhesion and good surface finish in non-ferrous alloys.
- With lower cutting forces and rigidity, this series is suitable for low rigidity machines.
- Available in two and four flutes in both square and ballnose type endmills (see page 84 for SNB Series Ballnose.)

Endmill Series

Two Flutes - METRIC					
Catalog No.	Stock	Cutter Dia.d \varnothing	Shank Dia.D \varnothing	Flute Length ℓ	Overall Length L
ASM2020DL	★	2.0mm	4.0mm	6.0mm	40.0mm
ASM2030DL	★	3.0mm	6.0mm	10.0mm	45.0mm
ASM2040DL	★	4.0mm	6.0mm	12.0mm	45.0mm
ASM2050DL	★	5.0mm	6.0mm	15.0mm	50.0mm
ASM2060DL	★	6.0mm	6.0mm	15.0mm	50.0mm
ASM2080DL	★	8.0mm	8.0mm	18.0mm	60.0mm
ASM2100DL	★	10.0mm	10.0mm	22.0mm	71.0mm
ASM2120DL	★	12.0mm	12.0mm	25.0mm	75.0mm
ASM2160DL	★	16.0mm	16.0mm	32.0mm	90.0mm

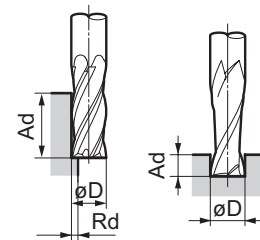
Grade: DL1000

Four Flutes - METRIC					
Catalog No.	Stock	Cutter Dia.d \varnothing	Shank Dia.D \varnothing	Flute Length ℓ	Overall Length L
ASM4020DL	★	2.0mm	4.0mm	6.0mm	40.0mm
ASM4030DL	★	3.0mm	6.0mm	10.0mm	45.0mm
ASM4040DL	★	4.0mm	6.0mm	12.0mm	45.0mm
ASM4050DL	★	5.0mm	6.0mm	15.0mm	50.0mm
ASM4060DL	★	6.0mm	6.0mm	15.0mm	50.0mm
ASM4080DL	★	8.0mm	8.0mm	18.0mm	60.0mm
ASM4100DL	★	10.0mm	10.0mm	22.0mm	71.0mm
ASM4120DL	★	12.0mm	12.0mm	25.0mm	75.0mm
ASM4160DL	★	16.0mm	16.0mm	32.0mm	90.0mm

Grade: DL1000

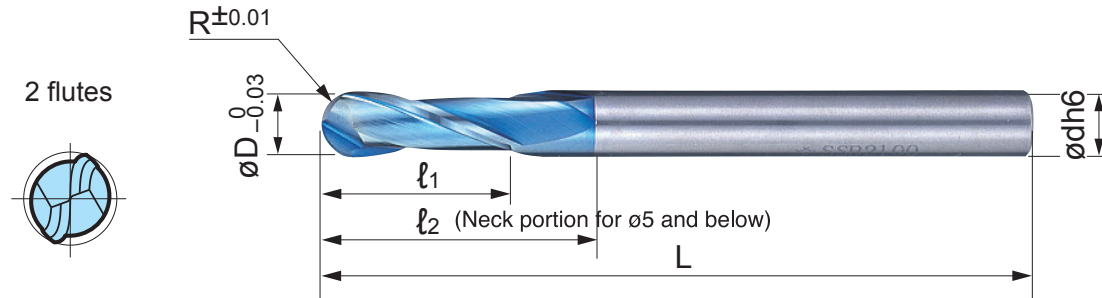
Recommended Running Conditions

Radius mm	Aluminum Alloy								
	Wet (Emulsion)				Dry				
	Side Milling (4 flute)		Groove Milling (2 flute)		Side Milling (4 flute)		Groove Milling (2 flute)		
	RPM	Feed Rate mm/min. (ipt)	RPM	Feed Rate mm/min. (ipt)	RPM	Feed Rate mm/min. (ipt)	RPM	Feed Rate mm/min. (ipt)	
2	40,000	1,400 (55)	28,000	280 (11)	40,000	980 (38)	28,000	200 (7)	
3	32,000	2,000 (80)	22,000	400 (16)	32,000	1,400 (55)	22,000	280 (11)	
4	26,000	2,600 (102)	18,000	520 (20)	26,000	1,800 (70)	18,000	360 (14)	
5	20,000	2,600 (102)	14,000	520 (20)	20,000	1,800 (70)	14,000	360 (14)	
6	17,000	2,700 (106)	12,000	540 (21)	17,000	1,900 (74)	12,000	370 (14)	
8	13,000	2,700 (106)	9,000	540 (21)	13,000	1,900 (74)	9,000	370 (14)	
10	11,000	2,800 (110)	7,200	560 (22)	11,000	2,000 (80)	7,200	390 (15)	
12	8,500	2,800 (110)	6,000	560 (22)	8,500	2,000 (80)	6,000	390 (15)	
16	6,400	2,800 (110)	4,500	560 (22)	6,400	2,000 (80)	4,500	390 (15)	
D.O.C.	Ad	1.5D		1.0D		1.5D		0.5D	
	Pf	0.2D		1.0D		0.2D		1.0D	



- For groove milling of stainless steel, use 60% recommended RPM and 40% feed rate.
- If cutting noise and vibration occur, please reduce the cutting speed accordingly.





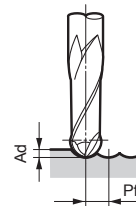
Helix angle :30°

Two Flutes - METRIC							
Sumitomo Catalog No.	Stock	R	øD	ℓ ₁	ℓ ₂	L	ød
SNB2020DL	★	1.0mm	2.0mm	3.0mm	5.0mm	60mm	6.0mm
SNB2030DL	★	1.5mm	3.0mm	4.5mm	8.0mm	80mm	6.0mm
SNB2040DL	★	2.0mm	4.0mm	6.0mm	12.0mm	80mm	6.0mm
SNB2050DL	★	2.5mm	5.0mm	7.5mm	14.0mm	90mm	6.0mm
SNB2060DL	★	3.0mm	6.0mm	9.0mm	-	100mm	6.0mm
SNB2080DL	★	4.0mm	8.0mm	12.0mm	-	100mm	8.0mm
SNB2100DL	★	5.0mm	10.0mm	15.0mm	-	120mm	10.0mm
SNB2120DL	★	6.0mm	12.0mm	18.0mm	-	120mm	12.0mm
SNB2160DL	★	8.0mm	16.0mm	24.0mm	-	160mm	16.0mm

Grade: DL1200

Recommended Running Conditions

Radius. mm	Aluminum Alloy			
	Wet (Emulsion)		Dry	
	RPM	Feed Rate mm/min. (ipt)	RPM	Feed Rate mm/min. (ipt)
2	48,000	1,500 (60)	48,000	1,000 (40)
3	38,000	2,100 (83)	38,000	1,500 (60)
4	31,000	2,800 (110)	31,000	2,000 (80)
5	24,000	2,800 (110)	24,000	2,000 (80)
6	20,000	2,800 (110)	20,000	2,000 (80)
8	15,000	2,800 (110)	15,000	2,000 (80)
10	13,000	3,000 (118)	13,000	2,100 (83)
12	10,000	3,000 (118)	10,000	2,100 (83)
16	7,700	3,000 (118)	7,700	2,100 (83)
D.O.C.	Ad	0.1D		0.1D
	Pf	0.2D		0.2D



- If cutting noise and vibration occur, please reduce the cutting speed accordingly.
- If the machine cannot reach recommended speed, use the maximum speed that can be achieved.





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PCBN & PCD MILLING

Pages 387-394

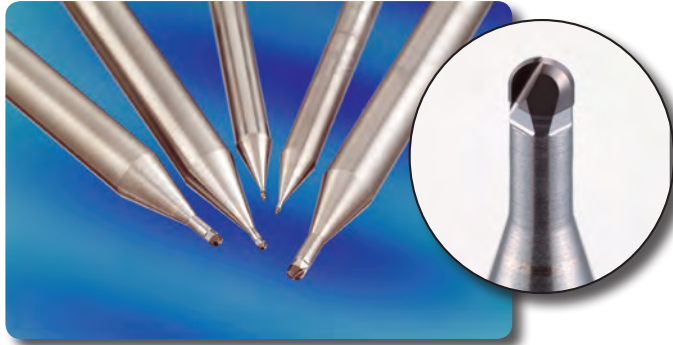


PCBN & PCD
Milling

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PCD CUTTERS	PAGES
RF Type Shell Mills.....	393
SRF Type Shell Mills.....	394

Mold Finish Master BNPB Type

High Speed, High Precision SUMIBORON Mill for Pre-Hardened/Hardened Steel



Features & Benefits

- Longer tool life in high speed, high precision machining of pre-hardened and hardened steel (~HRC70.)
- Uses SUMIBORON BN350 for excellent chipping resistance.
- High precision radial cutting edge profile accuracy of ± 0.0002 in. (0.005mm.)
- Excellent surface finish with a polishing process that is greatly reduced compared to solid carbide endmills.

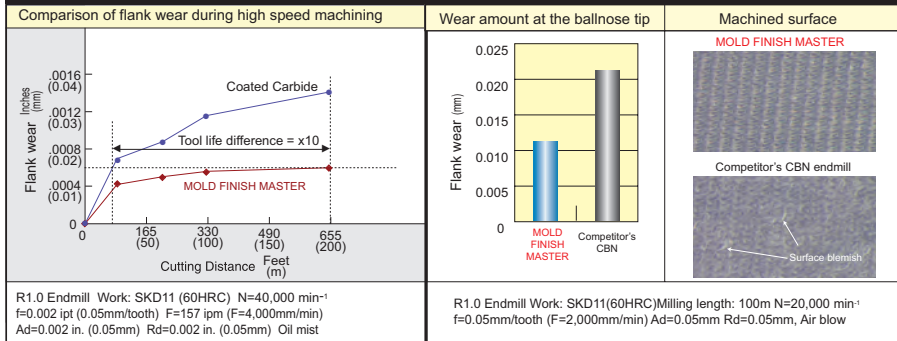
PCBN & PCD Milling

BNPB Endmill Availability - METRIC

Size	Sumitomo Cat. No.	Stock	Dimensions (mm)							
			BN350	R	øD	L	ød1	ød	ℓ1	ℓ2
ø4 Shank	BNBP2R020-0124	●	0.20	0.4	50	0.37	4.0	0.3	1.2	
	BNBP2R030-0154	●	0.30	0.6	50	0.57	4.0	0.4	1.5	
	BNBP2R050-0254	●	0.50	1.0	50	0.97	4.0	0.6	2.5	
	BNBP2R075-0404	●	0.75	1.5	50	1.47	4.0	0.9	4.0	
	BNBP2R100-0554	●	1.00	2.0	50	1.97	4.0	1.4	5.5	
ø6 Shank	BNBP2R020-0126	●	0.20	0.4	50	0.37	4.0	0.3	1.2	
	BNBP2R030-0156	●	0.30	0.6	50	0.57	4.0	0.4	1.5	
	BNBP2R050-0256	●	0.50	1.0	50	0.97	4.0	0.6	2.5	
	BNBP2R075-0406	●	0.75	1.5	50	1.47	4.0	0.9	4.0	
	BNBP2R100-0556	●	1.00	2.0	50	1.97	4.0	1.4	5.5	

BNBP 2 R030-015 4
 MOLD FINISH MASTER # of flutes Length from neck to tip (ℓ2) Radius of ballnose (R) Diameter of shank (ød)

BNPB Performance



Recommended Running Conditions

Ballnose Radius mm (in)	STAVAX, NAK80, SKD61 (~52HRC)				SDK11 (~62HRC)				SKH (~70HRC)			
	RPM	Feedrate mm/tooth (ipt)	D.O.C.		RPM	Feedrate mm/tooth (ipt)	D.O.C.		RPM	Feedrate mm/tooth (ipt)	D.O.C.	
			Ad mm (in)	Rd mm (in)			Ad mm (in)	Rd mm (in)			Ad mm (in)	Rd mm (in)
R0.2 (.008)	20,000~50,000	.02 (.0008)	.03 (.001)	.03 (.001)	20,000~50,000	.02 (.0008)	.01 (.0004)	.02 (.008)	20,000~50,000	.015 (.0006)	.01 (.0004)	.02 (.0008)
R0.3 (.012)	20,000~50,000	.02 (.0008)	.03 (.001)	.03 (.001)	20,000~50,000	.02 (.0008)	.01 (.0004)	.02 (.0008)	20,000~50,000	.015 (.0006)	.01 (.0004)	.02 (.0008)
R0.5 (.020)	20,000~50,000	.03 (.001)	.05 (.002)	.05 (.002)	20,000~50,000	.03 (.001)	.03 (.001)	.04 (.002)	20,000~50,000	.02 (.0008)	.02 (.0008)	.03 (.001)
R0.75 (.030)	20,000~50,000	.04 (.002)	.08 (.003)	0.1 (.004)	20,000~50,000	.04 (.002)	.05 (.002)	.05 (.002)	20,000~50,000	.03 (.001)	.02 (.0008)	.05 (.002)
R1.0 (.040)	20,000~50,000	.05 (.002)	0.1 (.004)	0.1 (.004)	17,000~50,000	.05 (.002)	.05 (.002)	.05 (.002)	17,000~50,000	.03 (.001)	.03 (.001)	.05 (.002)

- NOTES:
- For stable machining, a more rigid machine is recommended.
 - Air blow or oil mist coolant is recommended.
 - Shorten overhang as much as possible.



DRILL SYSTEMS

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Technical
Data

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- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-ferrous
- S** Exotic Materials
- H** Hardened Steel

Type	Series	Coolant		Coating/ Insert Grade	Dia. Min to Max (in / mm)	Drilling Depth	Catalog Number	P		H		M	S	K		N		
		Soft Steel	General Steel					45HRC	60HRC	Stainless Steel	Titanium Alloy	Inconel	Gray Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy		
Solid	GS		●	DEX	.1110-.6250 2.00-16.00	2XD	MDW□□□□GS2	✓	✓	●				✓	✓			
				DEX	.2010-.6250 2.00-16.00	4XD	MDW□□□□GS4											
	HGS		●	DEX	.1094-.6250 1.50-16.00	3XD	MDW□□□□HGS3											
				DEX	.1250-.6250 2.00-16.00	5XD	MDW□□□□HGS5	✓	✓	●	✓	✓	✓	✓	✓	✓	▲	●
				DEX	.1250-.6250 2.00-16.00	8XD	MDW□□□□HGS8											
	MDS-V		●	TiAlN	.1110-.7812 2.80-19.50	2.5XD	MDS□□□□V	✓	✓	●					✓	✓		
				TiAlN	.2460-.7812 6.00-19.50	3.5XD												
	MDS-HV		●	TiAlN	.1094-.7812 1.50-20.00	4XD	MDS□□□□MHV	✓	✓	●	✓	●	●	✓	✓	✓	▲	●
				TiAlN	.1250-.7812 4.00-20.00	5XD	MDS□□□□LHV											
	XHV		●	DEX	.1250-.7500 3.00-14.00	12XD	MDW□□□□XHV12	✓	✓	●					✓	✓	●	●
			DEX	.1250-.5310 3.00-14.00	20XD	MDW□□□□XHV20												
MDUS		●	Special	0.03-0.18	10XD	MDUS□□□□-30C	✓	✓			✓	●					✓	
MDSS		●	Special	0.20-1.00	10XD	MDSS□□□□	✓	✓	✓	●	✓	●	●	✓	✓	●	●	
NHGS		●	DLC	3.00-16.00	5XD	MDW□□□□NHGS5									●	●	✓	✓
Indexable	WDX		●	ACP300	.5620-2.625 13.00-68.00	2XD	WDX□□□□D2S1□□	✓	✓			✓	●	●				
			ACK300	3XD		WDX□□□□D3S1□□												
			ACK300	4XD		WDX□□□□D4S1□□										✓	✓	
	SMD	(MTL, MEL, MTL-C)	●	DEX		.4688-1.2125 12.00-30.80	3XD	SMDH□□□M	✓	✓	●		●		●	✓		●
.4688-1.2125 12.00-30.80						5XD	SMDH□□□L	✓	●		✓	●	●	✓	✓	●	●	
.4688-1.2125 13.50-30.80						8XD	SMDH□□□D								✓	✓		
Brazed	KDS	●	TiAlN		.3750-1.1875 10.00-30.00	3XD	KDS□□□□MAV	✓	✓	●		●		●	✓	▲	●	
					.3750-1.1875 14.00-26.00	5XD	KDS□□□□LAV											

✓: Best ●: Good ▲: Requires sharp edge

■ Drill Identification

MDS 150 M HV
 Drill dia. (φ15.0 mm) | Series name
 Classification code | Length code (S,M,L,D)

MDW 01250 GS 2
 Drill dia. (φ.125 in) | Length code (2,5,8,15,20,25)
 Classification code | Series name



SOLID CARBIDE DRILLS

Pages 403-440



Solid Carbide
Drills

SOLID CARBIDE DRILLS	PAGES
GS • HGS Series	
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MDS Series-Speeds & Feeds	440



Longer flute lengths for deeper hole capability and more material available for regrinding.

Super Drill for Super Alloys!

Newly developed PVD DEX coating provides improved heat and wear resistance at increased speeds.

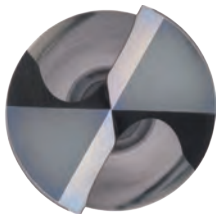
DEX coating



Unique thinning design promotes stable drilling performance.

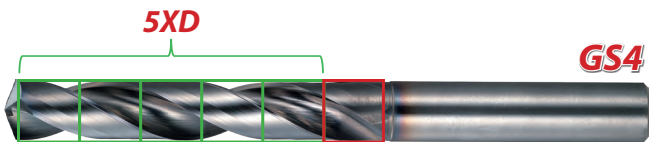


J-Flute design offers a wide chip pocket, producing more compact chips while achieving higher speeds.



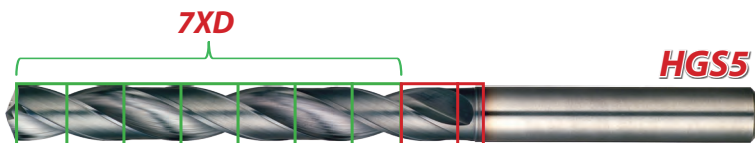
GS Series - External Coolant:

- GS2 (2XD) - Possible to drill to 3XD*
- GS4 (4XD) - Possible to drill to 5XD*



HGS Series - Internal Coolant:

- HGS3 (3XD) - Possible to drill to 4XD*
- HGS5 (5XD) - Possible to drill to 7XD*
- HGS8 (8XD) - Possible to drill to 10XD*



* Not all drills can achieve this depth and some drills may have even deeper capability. Always check for sufficient flute length.

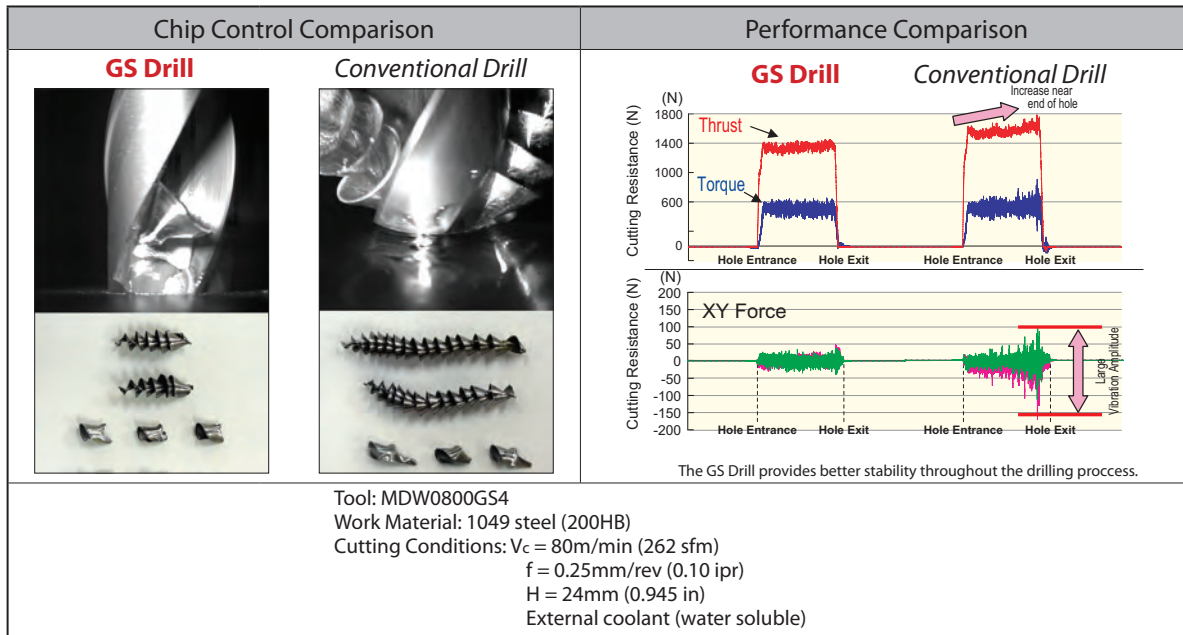




■ **Features & Benefits**

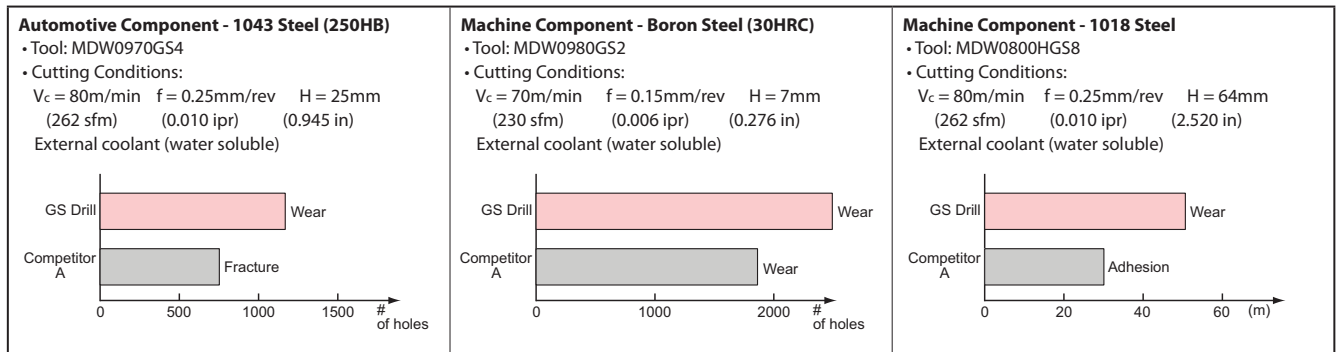
- **Long Tool Life**
 New cutting edge design and special DEX coating provide long tool life in a wide variety of work materials
- **Stable Chip Evacuation**
 New flute design and wide chip pocket allows for excellent chip management and evacuation
- **Quiet Cutting & Stable Cutting**
 Stable drilling with minimal vibration even in small machine applications
- **Environmentally Friendly**
 Compatible with MQL (Minimum Quantity Lubrication) Systems

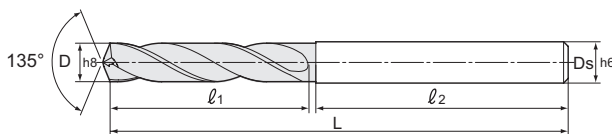
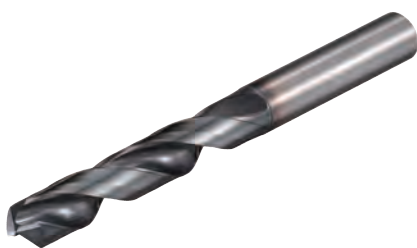
■ **Performance**



The GS Drill provides better stability throughout the drilling process.

■ **Application Examples**





MDW-GS2 2XD drill for excellent chip management and long tool life (External coolant)

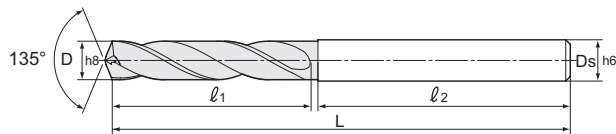
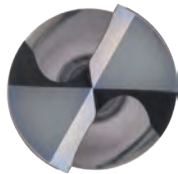
Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0200GS2	●		0.0787	2.00	45.0	8.0	34.0	3.0	
MDW0210GS2	●		0.0827	2.10	45.0	10.0	32.0	3.0	3-5/6
MDW0220GS2	●		0.0866	2.20	45.0	10.0	32.0	3.0	
MDW0230GS2	●		0.0906	2.30	45.0	10.0	32.0	3.0	
MDW00937GS2	●	3/32	0.0940	2.38	1.772	0.394	1.260	0.1250	
MDW0240GS2	●		0.0945	2.40	45.0	10.0	32.0	3.0	
MDW0250GS2	●		0.0984	2.50	45.0	10.0	32.0	3.0	
MDW0260GS2	●		0.1024	2.60	45.0	13.0	30.0	3.0	
MDW0270GS2	●		0.1063	2.70	45.0	13.0	30.0	3.0	6-3/2
MDW0280GS2	●		0.1102	2.80	45.0	13.0	30.0	3.0	
MDW01110GS2	●		0.1110	2.82	1.7717	0.5118	1.1811	0.1250	
MDW01130GS2	●		0.1130	2.87	1.7717	0.5118	1.1811	0.1250	6-4/0
MDW0290GS2	●		0.1142	2.90	45.0	13.0	30.0	3.0	3.5x.6
MDW01160GS2	●		0.1160	2.95	1.7717	0.5118	1.1811	0.1250	
MDW0300GS2	●		0.1181	3.00	45.0	13.0	30.0	3.0	
MDW01200GS2	●		0.1200	3.05	1.7717	0.5118	1.1811	0.1250	
MDW0310GS2	●		0.1220	3.10	54.0	19.0	33.0	4.0	
MDW01250GS2	●	1/8	0.1250	3.18	1.7717	0.5118	1.1811	0.1250	
MDW0320GS2	●		0.1260	3.20	54.0	19.0	33.0	4.0	
MDW01285GS2	●		0.1285	3.26	2.1260	0.7480	1.2992	0.1562	
MDW0330GS2	●		0.1299	3.30	54.0	19.0	33.0	4.0	M4x.7
MDW0340GS2	●		0.1339	3.40	54.0	19.0	33.0	4.0	
MDW01360GS2	●		0.1360	3.45	2.1260	0.7480	1.2992	0.1562	8-3/2/8-3/6
MDW0350GS2	●		0.1378	3.50	54.0	19.0	33.0	4.0	
MDW01405GS2	●		0.1405	3.57	2.1260	0.8268	1.2992	0.1562	
MDW01406GS2	●		0.1406	3.57	2.1260	0.8268	1.2992	0.1562	
MDW0360GS2	●		0.1417	3.60	54.0	21.0	33.0	4.0	
MDW01440GS2	●		0.1440	3.66	2.1260	0.8268	1.2992	0.1562	
MDW0370GS2	●		0.1457	3.70	54.0	21.0	33.0	4.0	M4.5x.7
MDW01470GS2	●		0.1470	3.73	2.1260	0.8268	1.2992	0.1562	
MDW01495GS2	●		0.1495	3.797	2.1260	0.8268	1.2992	0.1562	10-2/4
MDW0380GS2	●		0.1496	3.80	54.0	21.0	33.0	4.0	
MDW01520GS2	●		0.1520	3.86	2.1260	0.8268	1.2992	0.1562	
MDW0390GS2	●		0.1535	3.90	54.0	21.0	33.0	4.0	
MDW01540GS2	●		0.1540	3.91	2.1260	0.8268	1.2992	0.1562	
MDW01562GS2	●	5/32	0.1562	3.97	2.1260	0.8268	1.2992	0.1562	
MDW01570GS2	●		0.1570	3.99	2.4016	0.9055	1.4173	0.1875	
MDW0400GS2	●		0.1575	4.00	54.0	21.0	33.0	4.0	
MDW01590GS2	●	#21	0.1590	4.04	2.4016	0.9055	1.4173	0.1875	10-3/2
MDW01610GS2	●		0.1610	4.09	2.4016	0.9055	1.4173	0.1875	
MDW0410GS2	●		0.1614	4.10	61.0	23.0	36.0	5.0	
MDW0420GS2	●		0.1654	4.20	61.0	23.0	36.0	5.0	M5x.8
MDW01660GS2	●		0.1660	4.22	2.4016	0.9055	1.4173	0.1875	
MDW0430GS2	●		0.1693	4.30	61.0	23.0	36.0	5.0	
MDW01695GS2	●		0.1695	4.31	2.4016	0.9055	1.4173	0.1875	
MDW01719GS2	●	11/64	0.1719	4.37	2.4016	0.9055	1.4173	0.1875	
MDW01730GS2	●		0.1730	4.39	2.4016	0.9055	1.4173	0.1875	
MDW0440GS2	●		0.1732	4.40	61.0	23.0	36.0	5.0	
MDW01770GS2	●		0.1770	4.49	2.4016	0.9055	1.4173	0.1875	12-2/4

● = USA stocked item

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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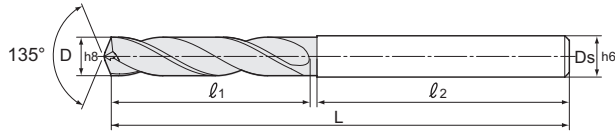
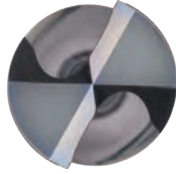
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MDW-GS2 2XD drill for excellent chip management and long tool life (External coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0450GS2	●		0.1772	4.50	61.0	23.0	36.0	5.0	
MDW01800GS2	●		0.1800	4.57	2.4016	0.9843	1.4173	0.1875	
MDW0460GS2	●		0.1811	4.60	61.0	25.0	36.0	5.0	
MDW01820GS2	●		0.1820	4.62	2.4016	0.9843	1.4173	0.1875	12-28
MDW01850GS2	●		0.1850	4.70	2.4016	0.9843	1.4173	0.1875	
MDW0470GS2	●		0.1850	4.70	61.0	25.0	36.0	5.0	
MDW01875GS2	●	3/16	0.1875	4.76	2.4016	0.9843	1.4173	0.1875	
MDW0480GS2	●		0.1890	4.80	61.0	25.0	36.0	5.0	
MDW01890GS2	●		0.1890	4.80	2.5591	0.9843	1.4961	0.2344	
MDW01910GS2	●		0.1910	4.85	2.5591	0.9843	1.4961	0.2344	
MDW0490GS2	●		0.1929	4.90	61.0	25.0	36.0	5.0	
MDW01935GS2	●		0.1935	4.91	2.5591	0.9843	1.4961	0.2344	
MDW01960GS2	●		0.1960	4.98	2.5591	0.9843	1.4961	0.2344	
MDW0500GS2	●		0.1969	5.00	61.0	25.0	36.0	5.0	M6x1
MDW0510GS2	●		0.2008	5.10	65.0	25.0	38.0	6.0	
MDW02010GS2	●	#7	0.2010	5.11	2.5591	0.9843	1.4961	0.2344	1/4-20
MDW02031GS2	●	13/64	0.2031	5.16	2.5591	0.9843	1.4961	0.2344	
MDW02040GS2	●		0.2040	5.18	2.5591	0.9843	1.4961	0.2344	
MDW0520GS2	●		0.2047	5.20	65.0	25.0	38.0	6.0	
MDW02055GS2	●		0.2055	5.22	2.5591	0.9843	1.4961	0.2344	
MDW0530GS2	●		0.2087	5.30	65.0	25.0	38.0	6.0	
MDW02090GS2	●		0.2090	5.31	2.5591	0.9843	1.4961	0.2344	
MDW0540GS2	●		0.2126	5.40	65.0	25.0	38.0	6.0	
MDW02130GS2	●	#3	0.2130	5.41	2.5591	0.9843	1.4961	0.2344	
MDW0550GS2	●		0.2165	5.50	65.0	25.0	38.0	6.0	
MDW02188GS2	●	7/32	0.2188	5.56	2.5591	1.0630	1.4961	0.2344	1/4-28
MDW0560GS2	●		0.2205	5.60	65.0	27.0	38.0	6.0	
MDW02210GS2	●	#2	0.2210	5.61	2.5591	1.0630	1.4961	0.2344	
MDW0570GS2	●		0.2244	5.70	65.0	27.0	38.0	6.0	
MDW02280GS2	●		0.2280	5.79	2.5591	1.0630	1.4961	0.2344	
MDW0580GS2	●		0.2283	5.80	65.0	27.0	38.0	6.0	
MDW0590GS2	●		0.2323	5.90	65.0	27.0	38.0	6.0	
MDW02340GS2	●		0.2340	5.94	2.5591	1.0630	1.4961	0.2344	
MDW02344GS2	●	15/64	0.2344	5.95	2.5591	1.0630	1.4961	0.2344	
MDW0600GS2	●		0.2362	6.00	65.0	27.0	38.0	6.0	M7x1
MDW02380GS2	●		0.2380	6.05	2.8740	1.2205	1.5748	0.2812	
MDW0610GS2	●		0.2402	6.10	73.0	31.0	40.0	7.0	
MDW02420GS2	●	#C	0.2420	6.15	2.8740	1.2205	1.5748	0.2812	
MDW0620GS2	●		0.2441	6.20	73.0	31.0	40.0	7.0	
MDW02460GS2	●		0.2460	6.25	2.8740	1.2205	1.5748	0.2812	
MDW0630GS2	●		0.2480	6.30	73.0	31.0	40.0	7.0	
MDW02500GS2	●	1/4	0.2500	6.35	2.8740	1.2205	1.5748	0.2812	
MDW0640GS2	●		0.2520	6.40	73.0	31.0	40.0	7.0	
MDW0650GS2	●		0.2559	6.50	73.0	31.0	40.0	7.0	
MDW02570GS2	●	#F	0.2570	6.53	2.8740	1.2992	1.5748	0.2812	5/16-18
MDW0660GS2	●		0.2598	6.60	73.0	33.0	40.0	7.0	
MDW02600GS2	●		0.2600	6.604	2.8740	1.2992	1.5748	0.2812	
MDW02610GS2	●		0.2610	6.63	2.8740	1.2992	1.5748	0.2812	

● = USA stocked item ★ = Worldwide Warehouse item available in 10 business days
Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.





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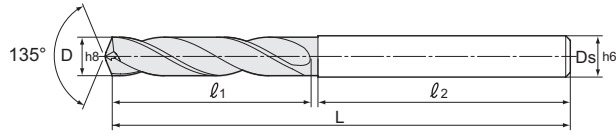
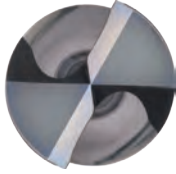
MDW-GS2 2XD drill for excellent chip management and long tool life (External coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0670GS2	●		0.2638	6.70	73.0	33.0	40.0	7.0	
MDW02656GS2	●	17/64	0.2656	6.75	2.8740	1.2992	1.5748	0.2812	
MDW02660GS2	●	#H	0.2660	6.76	2.8740	1.2992	1.5748	0.2812	
MDW02677GS2	●		0.2677	6.80	2.8740	1.2992	1.5748	0.2812	
MDW0680GS2	●		0.2677	6.80	73.0	33.0	40.0	7.0	
MDW0690GS2	●		0.2717	6.90	73.0	33.0	40.0	7.0	
MDW02720GS2	●	#I	0.2720	6.91	2.8740	1.2992	1.5748	0.2812	5/16-24
MDW0700GS2	●		0.2756	7.00	73.0	33.0	40.0	7.0	
MDW02756GS2	●		0.2756	7.00	2.8740	1.2992	1.5748	0.2812	
MDW02770GS2	●	#J	0.2770	7.04	2.8740	1.2992	1.5748	0.2812	
MDW0710GS2	●		0.2795	7.10	78.0	33.0	43.0	8.0	
MDW02810GS2	●		0.2810	7.14	2.8740	1.2992	1.5748	0.2812	
MDW02812GS2	●	9/32	0.2812	7.142	2.8740	1.2992	1.5748	0.2812	
MDW0720GS2	●		0.2835	7.20	78.0	33.0	43.0	8.0	
MDW0730GS2	●		0.2874	7.30	78.0	33.0	43.0	8.0	
MDW02900GS2	●		0.2900	7.37	3.0709	1.2992	1.6929	0.3125	
MDW0740GS2	●		0.2913	7.40	78.0	33.0	43.0	8.0	
MDW02950GS2	●		0.2950	7.49	3.0709	1.2992	1.6929	0.3125	
MDW0750GS2	●		0.2953	7.50	78.0	33.0	43.0	8.0	
MDW02969GS2	●	19/64	0.2969	7.54	3.0709	1.4173	1.6535	0.3125	
MDW0760GS2	●		0.2992	7.60	78.0	36.0	42.0	8.0	
MDW03020GS2	●		0.3020	7.67	3.0709	1.4173	1.6535	0.3125	
MDW0770GS2	●		0.3031	7.70	78.0	36.0	42.0	8.0	
MDW0780GS2	●		0.3071	7.80	78.0	36.0	42.0	8.0	M9x1.25
MDW0790GS2	●		0.3110	7.90	78.0	36.0	42.0	8.0	
MDW03125GS2	●	5/16	0.3125	7.94	3.0709	1.4173	1.6535	0.3125	3/8-16
MDW0800GS2	●		0.3150	8.00	78.0	36.0	42.0	8.0	
MDW03160GS2	●		0.3160	8.03	3.2283	1.4173	1.7323	0.3594	
MDW0810GS2	●		0.3189	8.10	82.0	36.0	44.0	9.0	
MDW0820GS2	●		0.3228	8.20	82.0	36.0	44.0	9.0	
MDW03230GS2	●	#P	0.3230	8.204	3.2283	1.4173	1.7323	0.3594	
MDW0830GS2	●		0.3268	8.30	82.0	36.0	44.0	9.0	
MDW03281GS2	●	21/64	0.3281	8.33	3.2283	1.4173	1.7323	0.3594	
MDW03307GS2	●		0.3307	8.40	3.2283	1.4173	1.7323	0.3594	
MDW0840GS2	●		0.3307	8.40	82.0	36.0	44.0	9.0	
MDW03320GS2	●	#Q	0.3320	8.43	3.2283	1.4173	1.7323	0.3594	
MDW0850GS2	●		0.3346	8.50	82.0	36.0	44.0	9.0	M10x1.5
MDW0860GS2	●		0.3386	8.60	82.0	38.0	44.0	9.0	
MDW03386GS2	●		0.3386	8.60	3.2283	1.4961	1.7323	0.3594	
MDW03390GS2	●		0.3390	8.61	3.2283	1.4961	1.7323	0.3594	3/8-24
MDW0870GS2	●		0.3425	8.70	82.0	38.0	44.0	9.0	
MDW03438GS2	●	11/32	0.3438	8.73	3.2283	1.4961	1.7323	0.3594	
MDW0880GS2	●		0.3465	8.80	82.0	38.0	44.0	9.0	
MDW03475GS2	●		0.3475	8.83	3.2283	1.4961	1.7323	0.3594	
MDW03480GS2	●		0.3480	8.84	3.2283	1.4961	1.7323	0.3594	
MDW0890GS2	●		0.3504	8.90	82.0	38.0	44.0	9.0	
MDW0900GS2	●		0.3543	9.00	82.0	38.0	44.0	9.0	
MDW03580GS2	●		0.3580	9.09	3.2283	1.4961	1.7323	0.3594	

● = USA stocked item
Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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MDW-GS2 2XD drill for excellent chip management and long tool life (External coolant)

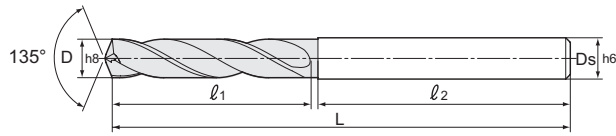
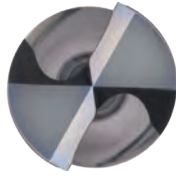
Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0910GS2	●		0.3583	9.10	87.0	38.0	47.0	10.0	
MDW03594GS2	●	23/64	0.3594	9.13	3.2283	1.4961	1.7323	0.3594	
MDW0920GS2	●		0.3622	9.20	87.0	38.0	47.0	10.0	
MDW0930GS2	●		0.3661	9.30	87.0	38.0	47.0	10.0	
MDW03680GS2	●	#U	0.3680	9.35	3.4252	1.4961	1.8504	0.3906	7/16-14
MDW0940GS2	●		0.3701	9.40	87.0	38.0	47.0	10.0	
MDW0950GS2	●		0.3740	9.50	87.0	38.0	47.0	10.0	
MDW03750GS2	●	3/8	0.3750	9.53	3.4252	1.6142	1.8110	0.3906	
MDW03770GS2	●		0.3770	9.58	3.4252	1.6142	1.8110	0.3906	
MDW0960GS2	●		0.3780	9.60	87.0	41.0	46.0	10.0	
MDW03780GS2	●		0.3780	9.60	3.4252	1.6142	1.8110	0.3906	
MDW0970GS2	●		0.3819	9.70	87.0	41.0	46.0	10.0	
MDW0980GS2	●		0.3858	9.80	87.0	41.0	46.0	10.0	
MDW03860GS2	●		0.3860	9.804	3.4252	1.6142	1.8110	0.3906	
MDW0990GS2	●		0.3898	9.90	87.0	41.0	46.0	10.0	
MDW03906GS2	●	25/64	0.3906	9.92	3.4252	1.6142	1.8110	0.3906	7/16-20
MDW1000GS2	●		0.3937	10.00	87.0	41.0	46.0	10.0	
MDW03970GS2	●		0.3970	10.08	3.6614	1.6142	1.9685	0.4375	
MDW1010GS2	●		0.3976	10.10	93.0	41.0	50.0	11.0	
MDW1020GS2	●		0.4016	10.20	93.0	41.0	50.0	11.0	M12x1.75
MDW04040GS2	●		0.4040	10.26	3.6614	1.6142	1.9685	0.4375	
MDW1030GS2	●		0.4055	10.30	93.0	41.0	50.0	11.0	
MDW04062GS2	●	13/32	0.4062	10.32	3.6614	1.6142	1.9685	0.4375	
MDW1040GS2	●		0.4094	10.40	93.0	41.0	50.0	11.0	
MDW04130GS2	●		0.4130	10.49	3.6614	1.6142	1.9685	0.4375	
MDW1050GS2	●		0.4134	10.50	93.0	41.0	50.0	11.0	
MDW1060GS2	●		0.4173	10.60	93.0	45.0	48.0	11.0	
MDW1070GS2	●		0.4213	10.70	93.0	45.0	48.0	11.0	
MDW04219GS2	●	27/64	0.4219	10.72	3.6614	1.7717	1.8898	0.4375	1/2-13
MDW1080GS2	●		0.4252	10.80	93.0	45.0	48.0	11.0	
MDW1090GS2	●		0.4291	10.90	93.0	45.0	48.0	11.0	
MDW1100GS2	●		0.4331	11.00	93.0	45.0	48.0	11.0	
MDW1110GS2	●		0.4370	11.10	100.0	45.0	53.0	12.0	
MDW04375GS2	●	7/16	0.4375	11.11	3.6614	1.7717	1.8898	0.4375	
MDW1120GS2	●		0.4409	11.20	100.0	45.0	53.0	12.0	
MDW1130GS2	●		0.4449	11.30	100.0	45.0	53.0	12.0	
MDW1140GS2	●		0.4488	11.40	100.0	45.0	53.0	12.0	
MDW1150GS2	●		0.4528	11.50	100.0	45.0	53.0	12.0	
MDW04531GS2	●	29/64	0.4531	11.51	3.9370	1.8504	2.0866	0.4688	1/2-20
MDW1160GS2	●		0.4567	11.60	100.0	47.0	53.0	12.0	
MDW04570GS2	●		0.4570	11.61	3.9370	1.8504	2.0866	0.4688	
MDW1170GS2	●		0.4606	11.70	100.0	47.0	53.0	12.0	
MDW1180GS2	●		0.4646	11.80	100.0	47.0	53.0	12.0	
MDW1190GS2	●		0.4685	11.90	100.0	47.0	53.0	12.0	
MDW04688GS2	●	15/32	0.4688	11.91	3.9370	1.8504	2.0866	0.4688	
MDW1200GS2	●		0.4724	12.00	100.0	47.0	53.0	12.0	M14x2
MDW1210GS2	●		0.4764	12.10	100.0	47.0	51.0	13.0	
MDW1220GS2	●		0.4803	12.20	100.0	47.0	51.0	13.0	

● = USA stocked item

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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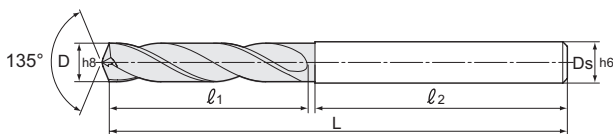
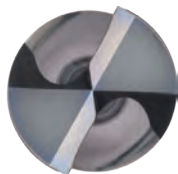
MDW-GS4 4XD drill for excellent chip management and long tool life (External coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0200GS4	●		0.0787	2.00	49.0	15.0	31.0	3.0	
MDW0210GS4	●		0.0827	2.10	49.0	17.0	30.0	3.0	3-56
MDW0220GS4	●		0.0866	2.20	49.0	17.0	30.0	3.0	
MDW0230GS4	●		0.0906	2.30	49.0	17.0	30.0	3.0	
MDW00937GS4	●	3/32	0.0937	2.38	1.9291	0.6693	1.1811	0.125	
MDW0240GS4	●		0.0945	2.40	49.0	17.0	30.0	3.0	
MDW0250GS4	●		0.0984	2.50	49.0	17.0	30.0	3.0	
MDW0260GS4	●		0.1024	2.60	49.0	19.0	30.0	3.0	
MDW0270GS4	●		0.1063	2.70	49.0	19.0	30.0	3.0	6-32
MDW0280GS4	●		0.1102	2.80	49.0	19.0	30.0	3.0	
MDW0290GS4	●		0.1142	2.90	49.0	19.0	30.0	3.0	3.5x.6
MDW0300GS4	●		0.1181	3.00	49.0	19.0	30.0	3.0	
MDW0310GS4	●		0.1220	3.10	60.0	24.0	34.0	4.0	
MDW0320GS4	●		0.1260	3.20	60.0	24.0	34.0	4.0	
MDW0330GS4	●		0.1299	3.30	60.0	24.0	34.0	4.0	M4x.7
MDW0340GS4	●		0.1339	3.40	60.0	24.0	34.0	4.0	
MDW0350GS4	●		0.1378	3.50	60.0	24.0	34.0	4.0	
MDW0360GS4	●		0.1417	3.60	60.0	27.0	33.0	4.0	
MDW0370GS4	●		0.1457	3.70	60.0	27.0	33.0	4.0	M4.5x.7
MDW0380GS4	●		0.1496	3.80	60.0	27.0	33.0	4.0	
MDW0390GS4	●		0.1535	3.90	60.0	27.0	33.0	4.0	
MDW0400GS4	●		0.1575	4.00	60.0	27.0	33.0	4.0	
MDW0410GS4	●		0.1614	4.10	76.0	31.0	43.0	5.0	
MDW0420GS4	●		0.1654	4.20	76.0	31.0	43.0	5.0	M5x.8
MDW0430GS4	●		0.1693	4.30	76.0	31.0	43.0	5.0	
MDW0440GS4	●		0.1732	4.40	76.0	31.0	43.0	5.0	
MDW0450GS4	●		0.1772	4.50	76.0	31.0	43.0	5.0	
MDW0460GS4	●		0.1811	4.60	76.0	38.0	38.0	5.0	
MDW0470GS4	●		0.1850	4.70	76.0	38.0	38.0	5.0	
MDW0480GS4	●		0.1890	4.80	76.0	38.0	38.0	5.0	
MDW0490GS4	●		0.1929	4.90	76.0	38.0	38.0	5.0	
MDW0500GS4	●		0.1969	5.00	76.0	38.0	38.0	5.0	
MDW0510GS4	●		0.2008	5.10	81.0	39.0	40.0	6.0	M6x1
MDW02010GS4	●	#7	0.2010	5.11	3.1890	1.5354	1.5748	0.2344	1/4-20
MDW0520GS4	●		0.2047	5.20	81.0	39.0	40.0	6.0	
MDW0530GS4	●		0.2087	5.30	81.0	39.0	40.0	6.0	
MDW0540GS4	●		0.2126	5.40	81.0	39.0	40.0	6.0	
MDW0550GS4	●		0.2165	5.50	81.0	39.0	40.0	6.0	
MDW0560GS4	●		0.2205	5.60	81.0	41.0	40.0	6.0	
MDW0570GS4	●		0.2244	5.70	81.0	41.0	40.0	6.0	
MDW0580GS4	●		0.2283	5.80	81.0	41.0	40.0	6.0	
MDW0590GS4	●		0.2323	5.90	81.0	41.0	40.0	6.0	
MDW0600GS4	●		0.2362	6.00	81.0	41.0	40.0	6.0	M7x1
MDW0610GS4	●		0.2402	6.10	83.0	42.0	40.0	7.0	
MDW0620GS4	●		0.2441	6.20	83.0	42.0	40.0	7.0	
MDW02460GS4	●		0.2460	6.25	3.2677	1.6535	1.5748	0.2812	
MDW0630GS4	●		0.2480	6.30	83.0	42.0	40.0	7.0	
MDW02500GS4	●	1/4	0.2500	6.35	3.2677	1.6535	1.5748	0.2812	
MDW0640GS4	●		0.2520	6.40	83.0	42.0	40.0	7.0	
MDW0650GS4	●		0.2559	6.50	83.0	42.0	40.0	7.0	
MDW02570GS4	●	#F	0.2570	6.53	3.2677	1.6929	1.5748	0.2812	5/16-18
MDW0660GS4	●		0.2598	6.60	83.0	43.0	40.0	7.0	
MDW02610GS4	●		0.2610	6.63	3.2677	1.6929	1.5748	0.2812	
MDW0670GS4	●		0.2638	6.70	83.0	43.0	40.0	7.0	

● = USA stocked item

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request. (continued on next page)





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MDW-GS4 4XD drill for excellent chip management and long tool life (External coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW02656GS4	●	17/64	0.2656	6.75	3.2677	1.6929	1.5748	0.2812	
MDW02660GS4	●	#H	0.2660	6.76	3.2677	1.6929	1.5748	0.2812	
MDW0680GS4	●		0.2677	6.80	83.0	43.0	40.0	7.0	
MDW0690GS4	●		0.2717	6.90	83.0	43.0	40.0	7.0	
MDW02720GS4	●	#I	0.2720	6.91	3.2677	1.6929	1.5748	0.2812	5/16-24
MDW0700GS4	●		0.2756	7.00	83.0	43.0	40.0	7.0	
MDW02770GS4	●	#J	0.2770	7.04	3.2677	1.6929	1.5748	0.2812	
MDW0710GS4	●		0.2795	7.10	90.0	45.0	43.0	8.0	
MDW02810GS4	●		0.2810	7.14	3.2677	1.6929	1.5748	0.2812	
MDW02812GS4	●	9/32	0.2812	7.142	3.2677	1.6929	1.5748	0.2812	
MDW0720GS4	●		0.2835	7.20	90.0	45.0	43.0	8.0	
MDW0730GS4	●		0.2874	7.30	90.0	45.0	43.0	8.0	
MDW02900GS4	●		0.2900	7.37	3.5433	1.7717	1.6929	0.3125	
MDW0740GS4	●		0.2913	7.40	90.0	45.0	43.0	8.0	
MDW02950GS4	●		0.2950	7.49	3.5433	1.7717	1.6929	0.3125	
MDW0750GS4	●		0.2953	7.50	90.0	45.0	43.0	8.0	
MDW02969GS4	●	19/64	0.2969	7.54	3.5433	1.8898	1.6535	0.3125	
MDW0760GS4	●		0.2992	7.60	90.0	48.0	42.0	8.0	
MDW03020GS4	●		0.3020	7.67	3.5433	1.8898	1.6535	0.3125	
MDW0770GS4	●		0.3031	7.70	90.0	48.0	42.0	8.0	
MDW0780GS4	●		0.3071	7.80	90.0	48.0	42.0	8.0	M9x1.25
MDW0790GS4	●		0.3110	7.90	90.0	48.0	42.0	8.0	
MDW03125GS4	●	5/16	0.3125	7.94	3.5433	1.8898	1.6535	0.3125	3/8-16
MDW0800GS4	●		0.3150	8.00	90.0	48.0	42.0	8.0	
MDW03160GS4	●		0.3160	8.03	3.8583	2.0866	1.6929	0.3594	
MDW0810GS4	●		0.3189	8.10	98.0	53.0	43.0	9.0	
MDW0820GS4	●		0.3228	8.20	98.0	53.0	43.0	9.0	
MDW03230GS4	●	#P	0.3230	8.204	3.8583	2.0866	1.6929	0.3594	
MDW0830GS4	●		0.3268	8.30	98.0	53.0	43.0	9.0	
MDW03281GS4	●	21/64	0.3281	8.33	3.8583	2.0866	1.6929	0.3594	
MDW0840GS4	●		0.3307	8.40	98.0	53.0	43.0	9.0	
MDW03320GS4	●	#Q	0.3320	8.43	3.8583	2.0866	1.6929	0.3594	
MDW0850GS4	●		0.3346	8.50	98.0	53.0	43.0	9.0	M10x1.5
MDW0860GS4	●		0.3386	8.60	98.0	55.0	43.0	9.0	
MDW03390GS4	●		0.3390	8.61	3.8583	2.1654	1.6929	0.3594	3/8-24
MDW0870GS4	●		0.3425	8.70	98.0	55.0	43.0	9.0	
MDW03438GS4	●	11/32	0.3438	8.73	3.8583	2.1654	1.6929	0.3594	
MDW0880GS4	●		0.3465	8.80	98.0	55.0	43.0	9.0	
MDW03480GS4	●		0.3480	8.84	3.8583	2.1654	1.6929	0.3594	
MDW0890GS4	●		0.3504	8.90	98.0	55.0	43.0	9.0	
MDW0900GS4	●		0.3543	9.00	98.0	55.0	43.0	9.0	
MDW03580GS4	●		0.3580	9.09	3.8583	2.1654	1.6929	0.3594	
MDW0910GS4	●		0.3583	9.10	105.0	58.0	45.0	10.0	
MDW03594GS4	●	23/64	0.3594	9.13	3.8583	2.1654	1.6929	0.3594	
MDW0920GS4	●		0.3622	9.20	105.0	58.0	45.0	10.0	
MDW0930GS4	●		0.3661	9.30	105.0	58.0	45.0	10.0	
MDW03680GS4	●	#U	0.3680	9.35	4.1339	2.2835	1.7717	0.3906	7/16-14
MDW0940GS4	●		0.3701	9.40	105.0	58.0	45.0	10.0	
MDW0950GS4	●		0.3740	9.50	105.0	58.0	45.0	10.0	
MDW03750GS4	●	3/8	0.3750	9.53	4.1339	2.3622	1.7717	0.3906	
MDW03770GS4	●		0.3770	9.58	4.1339	2.3622	1.7717	0.3906	
MDW0960GS4	●		0.3780	9.60	105.0	60.0	45.0	10.0	

● = USA stocked item

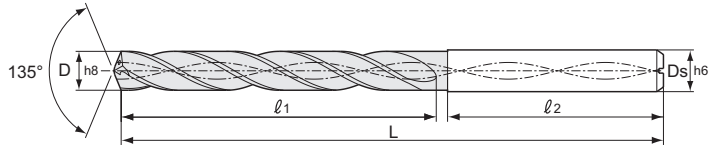
Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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MDW-HGS3 Series Solid Carbide Coolant Through Drills

SERIES MDW-HGS3



MDW-HGS3 3XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS3S	HGS3S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Tap Size
MDW0150HGS3	●		0.059	1.50	3.0			63.0	10	50	
MDW0160HGS3	●		0.063	1.60	3.0			63.0	12	50	M2x.4
MDW0170HGS3	●		0.067	1.70	3.0			63.0	12	50	
MDW0180HGS3	●		0.071	1.80	3.0			63.0	12	50	
MDW0190HGS3	●		0.075	1.90	3.0			63.0	12	50	
MDW0200HGS3	●		0.079	2.00	3.0			63.0	12.5	48	
MDW0210HGS3	●		0.083	2.10	3.0			68.0	15	51	3-56
MDW0220HGS3	●		0.087	2.20	3.0			68.0	15	51	
MDW0230HGS3	●		0.091	2.30	3.0			68.0	15	51	
MDW00937HGS3	●	3/32	0.094	2.38	0.125	●	3.0	2.677	0.689	1.929	
MDW0240HGS3	●		0.095	2.40	3.0			68.0	15	51	
MDW0250HGS3	●		0.098	2.50	3.0			68.0	15	51	
MDW0260HGS3	●		0.102	2.60	3.0			68.0	17.5	49	
MDW0270HGS3	●		0.106	2.70	3.0			68.0	17.5	49	6-32
MDW01094HGS3	●	7/64	0.109	2.78	0.125	●	3.0	2.677	0.689	1.929	
MDW0280HGS3	●		0.110	2.80	3.0			68.0	17.5	49	
MDW0290HGS3	●		0.114	2.90	3.0			68.0	17.5	49	3.5x.6
MDW0300HGS3	●		0.118	3.00	3.0	●	6.0	68.0	17.5	49	
MDW0310HGS3	●		0.122	3.10	4.0	●	6.0	72.0	20.0	50	
MDW01250HGS3	●	1/8	0.125	3.18	0.125	●	6.0	2.677	0.689	1.929	
MDW0320HGS3	●		0.126	3.20	4.0	●	6.0	72.0	20	50	
MDW0330HGS3	●		0.130	3.30	4.0	●	6.0	72.0	20	50	M4x.7
MDW0340HGS3	●		0.134	3.40	4.0	●	6.0	72.0	20	50	
MDW0350HGS3	●		0.138	3.50	4.0	●	6.0	72.0	20	50	
MDW0360HGS3	●		0.142	3.60	4.0	●	6.0	72.0	22.5	48	
MDW0370HGS3	●		0.146	3.70	4.0	●	6.0	72.0	22.5	48	M4.5x.7
MDW0380HGS3	●		0.150	3.80	4.0	●	6.0	72.0	22.5	48	
MDW0390HGS3	●		0.154	3.90	4.0	●	6.0	72.0	22.5	48	
MDW01562HGS3	●	5/32	0.156	3.97	0.156	●	6.0	2.835	0.886	1.890	
MDW0400HGS3	●		0.158	4.00	4.0	●	6.0	72.0	22.5	48	
MDW01590HGS3	●	#21	0.159	4.04	0.188	●	6.0	3.150	0.984	2.087	10-32
MDW0410HGS3	●		0.161	4.10	5.0	●	6.0	80.0	25	53	
MDW0420HGS3	●		0.165	4.20	5.0	●	6.0	80.0	25	53	M5x.8
MDW0430HGS3	●		0.169	4.30	5.0	●	6.0	80.0	25	53	
MDW01719HGS3	●	11/64	0.172	4.37	0.188	●	6.0	3.1	0.984	2.087	
MDW0440HGS3	●		0.173	4.40	5.0	●	6.0	80.0	25	53	
MDW0450HGS3	●		0.177	4.50	5.0	●	6.0	80.0	25	53	
MDW0460HGS3	●		0.181	4.60	5.0	●	6.0	80.0	27.5	51	
MDW0470HGS3	●		0.185	4.70	5.0	●	6.0	80.0	27.5	51	
MDW01875HGS3	●	3/16	0.188	4.76	0.188	●	6.0	3.1	1.083	2.008	
MDW0480HGS3	●		0.189	4.80	5.0	●	6.0	80.0	27.5	51	
MDW0490HGS3	●		0.193	4.90	5.0	●	6.0	80.0	27.5	51	
MDW0500HGS3	●		0.197	5.00	5.0	●	6.0	80.0	27.5	51	M6x1
MDW0510HGS3	●		0.201	5.10	6.0			82.0	27.5	53	
MDW02010HGS3	●	#7	0.201	5.11	0.234	●	6.0	3.228	1.083	2.087	1/4-2020
MDW02031HGS3	●	13/64	0.203	5.16	0.234	●	6.0	3.228	1.083	2.087	
MDW0520HGS3	●		0.205	5.20	6.0			82.0	27.5	53	
MDW0530HGS3	●		0.209	5.30	6.0			82.0	27.5	53	
MDW0540HGS3	●		0.213	5.40	6.0			82.0	27.5	53	
MDW02130HGS3	●	#3	0.213	5.41	0.234	●	6.0	3.228	1.083	2.087	
MDW0550HGS3	●		0.217	5.50	6.0			82.0	27.5	53	
MDW02188HGS3	●	7/32	0.219	5.56	0.234	●	6.0	3.228	1.181	2.047	1/4-2028

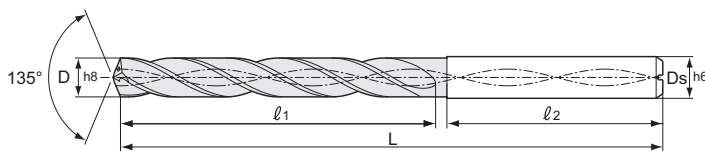
● = USA stocked item ★ = Worldwide Warehouse item available in 10 business days

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

Items labeled in purple represent Shrink Fit Shank Drills

(continued on next page)





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MDW-HGS3 3XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS3S	HGS3S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length l1 (in/mm)	Shank Length l2 (in/mm)	Tap Size
MDW0560HGS3	●		0.221	5.6	6.0			82	30	52	
MDW02210HGS3	●	#2	0.221	5.61	0.234	●	6.0	3.228	1.181	2.047	
MDW0570HGS3	●		0.224	5.7	6.0			82	30	52	
MDW0580HGS3	●		0.228	5.8	6.0			82	30	52	
MDW0590HGS3	●		0.232	5.9	6.0			82	30	52	
MDW02344HGS3	●	15/64	0.234	5.95	0.234	●	6.0	3.228	1.181	2.047	
MDW0600HGS3	●		0.236	6	6.0			82	30	52	M7x1
MDW0610HGS3	●		0.240	6.1	7.0	●	8.0	88	32.5	53	
MDW02420HGS3	●	#C	0.242	6.15	0.281	●	8.0	3.465	1.280	2.087	
MDW0620HGS3	●		0.244	6.2	7.0	●	8.0	88	32.5	53	
MDW0630HGS3	●		0.248	6.3	7.0	●	8.0	88	32.5	53	
MDW02500HGS3	●	1/4	0.25	6.35	0.281	●	8.0	3.465	1.280	2.087	
MDW0640HGS3	●		0.252	6.4	7.0	●	8.0	88	32.5	53	
MDW0650HGS3	●		0.256	6.5	7.0	●	8.0	88	32.5	53	
MDW02570HGS3	●	#F	0.257	9.68	0.281	●	8.0	3.465	1.378	2.087	5/16-18
MDW0653HGS3	●		0.257	6.53	7.0	●	8.0	88	35	53	
MDW0660HGS3	●		0.260	6.6	7.0	●	8.0	88	35	53	
MDW0670HGS3	●		0.264	6.7	7.0	●	8.0	88	35	53	
MDW02656HGS3	●	17/64	0.266	6.75	0.281	●	8.0	3.465	1.378	2.087	
MDW02660HGS3	●		0.266	6.76	0.281	●	8.0	3.465	1.378	2.087	
MDW0680HGS3	●		0.268	6.8	7.0	●	8.0	88	35	53	
MDW0690HGS3	●		0.272	6.9	7.0	●	8.0	88	35	53	
MDW02720HGS3	●	#I	0.272	6.91	0.281	●	8.0	3.465	1.378	2.087	5/16-24
MDW0700HGS3	●		0.276	7	7.0	●	8.0	88	35	53	
MDW02770HGS3	●	#J	0.277	7.04	0.281	●	8.0	3.465	1.378	2.087	
MDW0710HGS3	●		0.280	7.1	8.0			94	37.5	54	
MDW02812HGS3	●	9/32	0.281	7.14	0.281	●	8.0	3.465	1.378	2.087	
MDW0720HGS3	●		0.284	7.2	8.0			94	37.5	54	
MDW0730HGS3	●		0.287	7.3	8.0			94	37.5	54	
MDW0740HGS3	●		0.291	7.4	8.0			94	37.5	54	
MDW0750HGS3	●		0.295	7.5	8.0			94	37.5	54	
MDW02969HGS3	●	19/64	0.297	7.54	0.313	●	8.0	3.701	1.575	2.126	
MDW0760HGS3	●		0.299	7.6	8.0			94	40	54	
MDW0770HGS3	●		0.303	7.7	8.0			94	40	54	
MDW0780HGS3	●		0.307	7.8	8.0			94	40	54	M9x1.25
MDW0790HGS3	●		0.311	7.9	8.0			94	40	54	
MDW03125HGS3	●	5/16	0.313	7.94	0.313	●	8.0	3.701	1.575	2.126	3/8-16
MDW0800HGS3	●		0.315	8	8.0			94	40	54	
MDW0810HGS3	●		0.319	8.1	9.0	●	10.0	100	42.5	55	
MDW0820HGS3	●		0.323	8.2	9.0	●	10.0	100	42.5	55	
MDW03230HGS3	●	#P	0.323	8.204	0.359	●	10.0	3.937	1.673	2.165	
MDW0830HGS3	●		0.327	8.3	9.0	●	10.0	100	42.5	55	
MDW03281HGS3	●	21/64	0.328	8.33	0.359	●	10.0	3.937	1.673	2.165	
MDW0840HGS3	●		0.331	8.4	9.0	●	10.0	100	42.5	55	
MDW03320HGS3	●	#Q	0.332	8.43	0.359	●	10.0	3.937	1.673	2.165	
MDW0850HGS3	●		0.335	8.5	9.0	●	10.0	100	42.5	55	M10x1.5
MDW0860HGS3	●		0.339	8.6	9.0	●	10.0	100	45	55	

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 Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

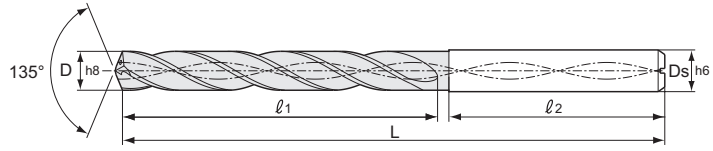
Items labeled in purple represent Shrink Fit Shank Drills

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MDW-HGS3 Series Solid Carbide Coolant Through Drills

SERIES MDW-HGS3



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MDW-HGS3 3XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS3S	HGS3S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length ℓ_1 (in/mm)	Shank Length ℓ_2 (in/mm)	Tap Size
MDW0870HGS3	●		0.343	8.7	9.0	●	10.0	100	45	55	
MDW03438HGS3	●	11/32	0.344	8.73	0.359	●	10.0	3.937	1.772	2.165	
MDW0880HGS3	●		0.347	8.8	9.0	●	10.0	100	45	55	
MDW0890HGS3	●		0.350	8.9	9.0	●	10.0	100	45	55	
MDW0900HGS3	●		0.354	9	9.0	●	10.0	100	45	55	
MDW0910HGS3	●		0.358	9.1	10.0			106	47.5	56	
MDW03594HGS3	●	23/64	0.359	9.13	0.359	●	10.0	3.937	1.772	2.165	
MDW0920HGS3	●		0.362	9.2	10.0			106	47.5	56	
MDW0930HGS3	●		0.366	9.3	10.0			106	47.5	56	
MDW03680HGS3	●	#U	0.368	9.35	0.391	●	10.0	4.173	1.870	2.205	7/16-14
MDW0940HGS3	●		0.370	9.4	10.0			106	47.5	56	
MDW0950HGS3	●		0.374	9.5	10.0			106	47.5	56	
MDW03750HGS3	●	3/8	0.375	9.53	0.391	●	10.0	4.173	1.969	2.205	
MDW0960HGS3	●		0.378	9.6	10.0			106	50	56	
MDW0970HGS3	●		0.382	9.7	10.0			106	50	56	
MDW0980HGS3	●		0.386	9.8	10.0			106	50	56	
MDW0990HGS3	●		0.390	9.9	10.0			106	50	56	
MDW03906HGS3	●	25/64	0.391	9.92	0.391	●	10.0	4.173	1.969	2.205	7/16-20
MDW1000HGS3	●		0.394	10	10.0			106	50	56	
MDW1010HGS3	●		0.398	10.1	11.0	●	12.0	116	52.5	61	
MDW1020HGS3	●		0.402	10.2	11.0	●	12.0	116	52.5	61	M12x1.75
MDW1030HGS3	●		0.406	10.3	11.0	●	12.0	116	52.5	61	
MDW04062HGS3	●	13/32	0.406	10.32	0.438	●	12.0	4.567	2.067	2.402	
MDW1040HGS3	●		0.409	10.4	11.0	●	12.0	116	52.5	61	
MDW1050HGS3	●		0.413	10.5	11.0	●	12.0	116	52.5	61	
MDW1060HGS3	●		0.417	10.6	11.0	●	12.0	116	55	61	
MDW1070HGS3	●		0.421	10.7	11.0	●	12.0	116	55	61	
MDW04219HGS3	●	27/64	0.422	10.72	0.438	●	12.0	4.567	2.165	2.402	1/2-13
MDW1080HGS3	●		0.425	10.8	11.0	●	12.0	116	55	61	
MDW1090HGS3	●		0.429	10.9	11.0	●	12.0	116	55	61	
MDW1100HGS3	●		0.433	11	11.0	●	12.0	116	55	61	
MDW1110HGS3	●		0.437	11.1	12.0			122	57.5	62	
MDW04375HGS3	●	7/16	0.438	11.11	0.438	●	12.0	4.567	2.165	2.402	
MDW1120HGS3	●		0.441	11.2	12.0			122	57.5	62	
MDW1130HGS3	●		0.445	11.3	12.0			122	57.5	62	
MDW1140HGS3	●		0.449	11.4	12.0			122	57.5	62	
MDW1150HGS3	●		0.453	11.5	12.0			122	57.5	62	
MDW04531HGS3	●	29/64	0.453	11.51	0.469	●	12.0	4.803	2.362	2.441	1/2-20
MDW1160HGS3	●		0.457	11.6	12.0			122	60	62	
MDW1170HGS3	●		0.461	11.7	12.0			122	60	62	
MDW1180HGS3	●		0.465	11.8	12.0			122	60	62	
MDW1190HGS3	●		0.469	11.9	12.0			122	60	62	
MDW04688HGS3	●	15/32	0.469	11.91	0.469	●	12.0	4.803	2.362	2.441	
MDW1200HGS3	●		0.472	12	12.0			122	60	62	M14x2
MDW1210HGS3	●		0.476	12.1	13.0	●	14.0	128	62.5	63	
MDW1220HGS3	●		0.480	12.2	13.0	●	14.0	128	62.5	63	
MDW1230HGS3	●		0.484	12.3	13.0	●	14.0	128	62.5	63	9/16-12

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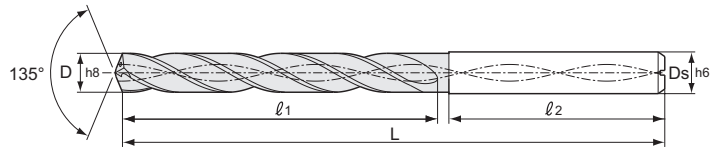
Items labeled in purple represent Shrink Fit Shank Drills

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MDW-HGS5 Series Solid Carbide Coolant Through Drills

SERIES MDW-HGS5



MDW-HGS5 5XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS5S	HGS5S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length ℓ_1 (in/mm)	Shank Length ℓ_2 (in/mm)	Tap Size
MDW0150HGS5	●		0.0591	1.5	3.0			70	14	56	
MDW0160HGS5	●		0.063	1.6	3.0			70	19	51	
MDW0170HGS5	●		0.067	1.7	3.0			70	19	51	
MDW0180HGS5	●		0.0709	1.8	3.0			70	19	51	
MDW0190HGS5	●		0.0748	1.9	3.0			70	19	51	
MDW0200HGS5	●		0.0787	2	3.0			70	19	49	
MDW0210HGS5	●		0.0827	2.1	3.0			78	24	52	
MDW0220HGS5	●		0.0866	2.2	3.0			78	24	52	
MDW0230HGS5	●		0.0906	2.3	3.0			78	24	52	
MDW00937HGS5	●	3/32	0.0937	2.38	0.125	●	3.0	3.0709	0.9449	1.8898	
MDW0240HGS5	●		0.0945	2.4	3.0			78	24	52	
MDW0250HGS5	●		0.0984	2.5	3.0			78	24	52	
MDW0260HGS5	●		0.1024	2.6	3.0			78	28	48	
MDW0270HGS5	●		0.1063	2.7	3.0			78	28	48	
MDW01094HGS5	●	7/64	0.1094	2.78	0.125	●	3.0	3.0709	1.1024	1.8898	
MDW0280HGS5	●		0.1102	2.8	3.0			78	28	48	
MDW0290HGS5	●		0.1142	2.9	3.0			78	28	48	
MDW0300HGS5	●		0.1181	3	3.0	●	6.0	78	28	48	
MDW0310HGS5	●		0.122	3.1	4.0	●	6.0	86	32	52	
MDW01250HGS5	●	1/8	0.125	3.18	0.125	●	3.0	3.0709	1.1024	1.8898	
MDW0320HGS5	●		0.126	3.2	4.0	●	6.0	86	32	52	
MDW0330HGS5	●		0.1299	3.3	4.0	●	6.0	86	32	52	
MDW0340HGS5	●		0.1339	3.4	4.0	●	6.0	86	32	52	
MDW0350HGS5	●		0.1378	3.5	4.0	●	6.0	86	32	52	
MDW01406HGS5	●		0.1406	3.57	0.1562	●	6.0	3.3858	1.4173	1.8898	
MDW0360HGS5	●		0.1417	3.6	4.0	●	6.0	86	36	48	
MDW0370HGS5	●		0.1457	3.7	4.0	●	6.0	86	36	48	
MDW0380HGS5	●		0.1496	3.8	4.0	●	6.0	86	36	48	
MDW0390HGS5	●		0.1535	3.9	4.0	●	6.0	86	36	48	
MDW01562HGS5	●	5/32	0.1562	3.97	0.1562	●	6.0	3.3858	1.4173	1.8898	
MDW0400HGS5	●		0.1575	4	4.0	●	6.0	86	36	48	
MDW01590HGS5	●	#21	0.159	4.04	0.1875	●	6.0	3.8583	1.5748	2.2047	
MDW0410HGS5	●		0.1614	4.1	5.0	●	6.0	98	40	56	
MDW0420HGS5	●		0.1654	4.2	5.0	●	6.0	98	40	56	
MDW0430HGS5	●		0.1693	4.3	5.0	●	6.0	98	40	56	
MDW01719HGS5	●	11/64	0.1719	4.37	0.1875	●	6.0	3.8583	1.5748	2.2047	
MDW0440HGS5	●		0.1732	4.4	5.0	●	6.0	98	40	56	
MDW0450HGS5	●		0.1772	4.5	5.0	●	6.0	98	40	56	
MDW0460HGS5	●		0.1811	4.6	5.0	●	6.0	98	44	52	
MDW0470HGS5	●		0.185	4.7	5.0	●	6.0	98	44	52	
MDW01875HGS5	●	3/16	0.1875	4.76	0.1875	●	6.0	3.8583	1.7323	2.0472	
MDW0480HGS5	●		0.189	4.8	5.0	●	6.0	98	44	52	
MDW0490HGS5	●		0.1929	4.9	5.0	●	6.0	98	44	52	
MDW0500HGS5	●		0.1969	5	5.0	●	6.0	98	44	52	
MDW0510HGS5	●		0.2008	5.1	6.0			100	44	54	
MDW02031HGS5	●	13/64	0.2031	5.16	0.2344	●	6.0	3.937	1.7323	2.126	
MDW0520HGS5	●		0.2047	5.2	6.0			100	44	54	
MDW0530HGS5	●		0.2087	5.3	6.0			100	44	54	
MDW0540HGS5	●		0.2126	5.4	6.0			100	44	54	
MDW02130HGS5	●	#3	0.213	5.41	0.2344	●	6.0	3.937	1.7323	2.126	
MDW0550HGS5	●		0.2165	5.5	6.0			100	44	54	
MDW02188HGS5	●	7/32	0.2188	5.56	0.2344	●	6.0	3.937	1.8898	2.0472	
MDW0560HGS5	●		0.2205	5.6	6.0			100	48	52	
MDW02210HGS5	●	#2	0.221	5.61	0.2344	●	6.0	3.937	1.8898	2.0472	
MDW0570HGS5	●		0.2244	5.7	6.0			100	48	52	
MDW0580HGS5	●		0.2283	5.8	6.0			100	48	52	

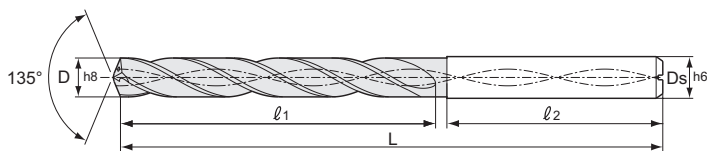
● = USA stocked item ★ = Worldwide Warehouse item available in 10 business days

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

Items labeled in purple represent Shrink Fit Shank Drills

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MDW-HGS5 5XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS5S	HGS5S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length l1 (in/mm)	Shank Length l2 (in/mm)	Tap Size
MDW0590HGS5	●		0.2323	5.9	6.0			100	48	52	
MDW02344HGS5	●	15/64	0.2344	5.95	0.2344	●	6.0	3.937	1.8898	2.0472	
MDW0600HGS5	●		0.2362	6.0	6.0			100	48	52	
MDW0610HGS5	●		0.2402	6.1	7.0	●	8.0	109	52	53	
MDW0620HGS5	●		0.2441	6.2	7.0	●	8.0	109	52	53	
MDW0630HGS5	●		0.248	6.3	7.0	●	8.0	109	52	53	
MDW02500HGS5	●	1/4	0.25	6.35	0.2812	●	8.0	4.2913	2.0472	2.0866	
MDW0640HGS5	●		0.252	6.4	7.0	●	8.0	109	52	53	
MDW0650HGS5	●		0.2559	6.5	7.0	●	8.0	109	52	53	
MDW02570HGS5	●	#F	0.257	6.53	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW0653HGS5	●		0.2571	6.53	7.0	●	8.0	109	56	53	
MDW0660HGS5	●		0.2598	6.6	7.0	●	8.0	109	56	53	
MDW0670HGS5	●		0.2638	6.7	7.0	●	8.0	109	56	53	
MDW02656HGS5	●	17/64	0.2656	6.75	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW02660HGS5	●	#H	0.266	6.76	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW0680HGS5	●		0.2677	6.8	7.0	●	8.0	109	56	53	
MDW0690HGS5	●		0.2717	6.9	7.0	●	8.0	109	56	53	
MDW02720HGS5	●	#I	0.272	6.91	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW0700HGS5	●		0.2756	7	7.0	●	8.0	109	56	53	
MDW02770HGS5	●	#J	0.277	7.04	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW0710HGS5	●		0.2795	7.1	8.0			118	60	54	
MDW02812HGS5	●	9/32	0.2812	7.14	0.2812	●	8.0	4.2913	2.2047	2.0866	
MDW0720HGS5	●		0.2835	7.2	8.0			118	60	54	
MDW0730HGS5	●		0.2874	7.3	8.0			118	60	54	
MDW0740HGS5	●		0.2913	7.4	8.0			118	60	54	
MDW0750HGS5	●		0.2953	7.5	8.0			118	60	54	
MDW02969HGS5	●	19/64	0.2969	7.54	0.3125	●	8.0	4.6457	2.5197	2.126	
MDW0760HGS5	●		0.2992	7.6	8.0			118	64	54	
MDW0770HGS5	●		0.3031	7.7	8.0			118	64	54	
MDW0780HGS5	●		0.3071	7.8	8.0			118	64	54	
MDW0790HGS5	●		0.311	7.9	8.0			118	64	54	
MDW03125HGS5	●	5/16	0.3125	7.94	0.3125	●	8.0	4.6457	2.5197	2.126	
MDW0800HGS5	●		0.315	8	8.0			118	64	54	
MDW0810HGS5	●		0.3189	8.1	9.0	●	10.0	127	68	55	
MDW0820HGS5	●		0.3228	8.2	9.0	●	10.0	127	68	55	
MDW03230HGS5	●	#P	0.323	8.204	0.3594	●	10.0	5	2.6772	2.1654	
MDW0830HGS5	●		0.3268	8.3	9.0	●	10.0	127	68	55	
MDW03281HGS5	●	21/64	0.3281	8.33	0.3594	●	10.0	5	2.6772	2.1654	
MDW0840HGS5	●		0.3307	8.4	9.0	●	10.0	127	68	55	
MDW03320HGS5	●	#Q	0.332	8.43	0.3594	●	10.0	5	2.6772	2.1654	
MDW0850HGS5	●		0.3346	8.5	9.0	●	10.0	127	68	55	
MDW0860HGS5	●		0.3386	8.6	9.0	●	10.0	127	72	55	
MDW0870HGS5	●		0.3425	8.7	9.0	●	10.0	127	72	55	
MDW03438HGS5	●	11/32	0.3438	8.73	0.3594	●	10.0	5	2.8346	2.1654	
MDW0880HGS5	●		0.3465	8.8	9.0	●	10.0	127	72	55	
MDW0890HGS5	●		0.3504	8.9	9.0	●	10.0	127	72	55	
MDW0900HGS5	●		0.3543	9	9.0	●	10.0	127	72	55	
MDW0910HGS5	●		0.3583	9.1	10.0			136	76	56	
MDW03594HGS5	●	23/64	0.3594	9.13	0.3594	●	10.0	5	2.8346	2.1654	
MDW0920HGS5	●		0.3622	9.2	10.0			136	76	56	
MDW0930HGS5	●		0.3661	9.3	10.0			136	76	56	
MDW03680HGS5	●	#U	0.368	9.35	0.3906	●	10.0	5.3543	2.9921	2.2047	

● = USA stocked item ★ = Worldwide Warehouse item available in 10 business days

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

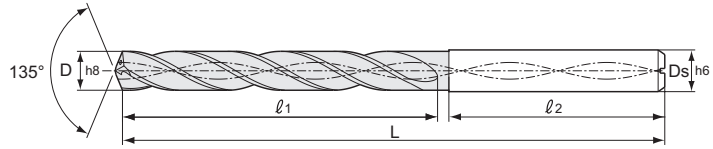
Items labeled in purple represent Shrink Fit Shank Drills

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MDW-HGS5 Series Solid Carbide Coolant Through Drills

SERIES MDW-HGS5



(continued from previous page)

MDW-HGS5 5XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter	Diameter D (mm)	Shank Diameter Ds (in/mm)	HGS5S	HGS5S Shank Diameter Ds	Overall Length L (in/mm)	Flute Length ℓ_1 (in/mm)	Shank Length ℓ_2 (in/mm)	Tap Size
MDW0940HGS5	•		0.3701	9.4	10.0			136	76	56	
MDW0950HGS5	•		0.374	9.5	10.0			136	76	56	
MDW03750HGS5	•	3/8	0.375	9.53	0.3906	•	10.0	5.3543	3.1496	2.2047	
MDW0960HGS5	•		0.378	9.6	10.0			136	80	56	
MDW0970HGS5	•		0.3819	9.7	10.0			136	80	56	
MDW0980HGS5	•		0.3858	9.8	10.0			136	80	56	
MDW0990HGS5	•		0.3898	9.9	10.0			136	80	56	
MDW03906HGS5	•	25/64	0.3906	9.92	0.3906	•	10.0	5.3543	3.1496	2.2047	
MDW1000HGS5	•		0.3937	10	10.0			136	80	56	
MDW1010HGS5	•		0.3976	10.1	11.0	•	12.0	149	84	61	
MDW1020HGS5	•		0.4016	10.2	11.0	•	12.0	149	84	61	
MDW1030HGS5	•		0.4055	10.3	11.0	•	12.0	149	84	61	
MDW04062HGS5	•	13/32	0.4062	10.32	0.4375	•	12.0	5.8661	3.3071	2.4016	
MDW1040HGS5	•		0.4094	10.4	11.0	•	12.0	149	84	61	
MDW1050HGS5	•		0.4134	10.5	11.0	•	12.0	149	84	61	
MDW1060HGS5	•		0.4173	10.6	11.0	•	12.0	149	88	61	
MDW1070HGS5	•		0.4213	10.7	11.0	•	12.0	149	88	61	
MDW04219HGS5	•	27/64	0.4219	10.72	0.4375	•	12.0	5.8661	3.4646	2.4016	
MDW1080HGS5	•		0.4252	10.8	11.0	•	12.0	149	88	61	
MDW1090HGS5	•		0.4291	10.9	11.0	•	12.0	149	88	61	
MDW1100HGS5	•		0.4331	11	11.0	•	12.0	149	88	61	
MDW1110HGS5	•		0.437	11.1	12.0			158	92	62	
MDW04375HGS5	•	7/16	0.4375	11.11	0.4375	•	12.0	5.8661	3.4646	2.4016	
MDW1120HGS5	•		0.4409	11.2	12.0			158	92	62	
MDW1130HGS5	•		0.4449	11.3	12.0			158	92	62	
MDW1140HGS5	•		0.4488	11.4	12.0			158	92	62	
MDW1150HGS5	•		0.4528	11.5	12.0			158	92	62	
MDW04531HGS5	•	29/64	0.4531	11.51	0.4688	•	12.0	6.2205	3.7795	2.4409	
MDW1160HGS5	•		0.4567	11.6	12.0			158	96	62	
MDW1170HGS5	•		0.4606	11.7	12.0			158	96	62	
MDW1180HGS5	•		0.4646	11.8	12.0			158	96	62	
MDW1190HGS5	•		0.4685	11.9	12.0			158	96	62	
MDW04688HGS5	•	15/32	0.4688	11.91	0.4688	•	12.0	6.2205	3.7795	2.4409	
MDW1200HGS5	•		0.4724	12	12.0			158	96	62	
MDW1210HGS5	•		0.4764	12.1	13.0	•	14.0	167	100	63	
MDW1220HGS5	•		0.4803	12.2	13.0	•	14.0	167	100	63	
MDW1230HGS5	•		0.4843	12.3	13.0	•	14.0	167	100	63	
MDW04844HGS5	•	31/64	0.4844	12.304	0.5156	•	14.0	6.5748	3.937	2.4803	
MDW1240HGS5	•		0.4882	12.4	13.0	•	14.0	167	100	63	
MDW1250HGS5	•		0.4921	12.5	13.0	•	14.0	167	100	63	
MDW1260HGS5	•		0.4961	12.6	13.0	•	14.0	167	104	63	
MDW1270HGS5	•	1/2	0.5	12.7	13.0	•	14.0	167	104	63	
MDW05000HGS5	•	1/2	0.5	12.7	0.5156	•	14.0	6.5748	4.0945	2.4803	
MDW1280HGS5	•		0.5039	12.8	13.0	•	14.0	167	104	63	
MDW1283HGS5	•		0.5051	12.83	13.0	•	14.0	167	104	63	
MDW1290HGS5	•		0.5079	12.9	13.0	•	14.0	167	104	63	
MDW1300HGS5	•		0.5118	13	13.0	•	14.0	167	104	63	
MDW05156HGS5	•	33/64	0.5156	13.09	0.5156	•	14.0	6.5748	4.0945	2.4803	
MDW1310HGS5	•		0.5157	13.1	14.0			176	108	64	
MDW1320HGS5	•		0.5197	13.2	14.0			176	108	64	
MDW1330HGS5	•		0.5236	13.3	14.0			176	108	64	
MDW1340HGS5	•		0.5276	13.4	14.0			176	108	64	
MDW05312HGS5	•	17/32	0.5312	13.49	0.5469	•	14.0	6.9291	4.252	2.5197	
MDW1350HGS5	•		0.5315	13.5	14.0			176	108	64	

• = USA stocked item ★ = Worldwide Warehouse item available in 10 business days

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

Items labeled in purple represent Shrink Fit Shank Drills

(continued on next page)



MDW-HGS8 Series Solid Carbide Coolant Through Drills

SERIES MDW-HGS8



h8 Manufacturing Tolerances

Tolerances of Diameters (in.)		Tolerances of Diameters (in.)		Tolerances of Diameters (in.)	
$D \leq .118$	+0 -.00055	$.236 < D \leq .394$	+0 -.00087	$.709 < D \leq .768$	+0 -.00130
$.118 < D \leq .236$	+0 -.00071	$.394 < D \leq .709$	+0 -.00106		

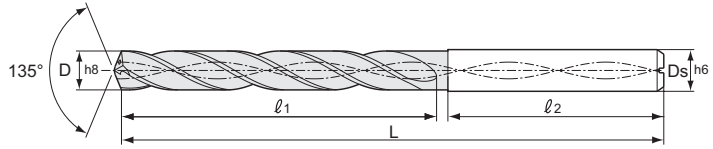
MDW-HGS8 8XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length ℓ_1 (in/mm)	Shank Length ℓ_2 (in/mm)	Shank Diameter D _s (in/mm)	Tap Size
MDW0150HGS8	●		0.0591	1.50	70.0	18.5		3.00	
MDW0200HGS8	●		0.0787	2.00	76.00	24.00	50.00	3.00	
MDW0210HGS8			0.0827	2.10	81.00	27.50	52.00	3.00	3-56
MDW0220HGS8			0.0866	2.20	81.00	27.50	52.00	3.00	
MDW0230HGS8			0.0906	2.30	81.00	27.50	52.00	3.00	
MDW00937HGS8	●	3/32	0.0937	2.38	3.1890	1.0827	2.0472	0.1250	
MDW0240HGS8			0.0945	2.40	81.00	27.50	52.00	3.00	
MDW0250HGS8	●		0.0984	2.50	81.00	27.50	52.00	3.00	
MDW0260HGS8			0.1024	2.60	81.00	33.00	48.00	3.00	
MDW0270HGS8			0.1063	2.70	81.00	33.00	48.00	3.00	6-32
MDW0280HGS8			0.1102	2.80	81.00	33.00	48.00	3.00	
MDW0290HGS8			0.1142	2.90	81.00	33.00	48.00	3.00	3.5x6
MDW0300HGS8	●		0.1181	3.00	81.00	33.00	48.00	3.00	
MDW0310HGS8			0.1220	3.10	92.00	38.50	52.00	4.00	
MDW01250HGS8	●	1/8	0.1250	3.18	3.1890	1.2992	1.8898	0.1250	
MDW0320HGS8			0.1260	3.20	92.00	38.50	52.00	4.00	
MDW0330HGS8	●		0.1299	3.30	92.00	38.50	52.00	4.00	M4x.7
MDW0340HGS8			0.1339	3.40	92.00	38.50	52.00	4.00	
MDW0350HGS8	●		0.1378	3.50	92.00	38.50	52.00	4.00	
MDW01406HGS8	●		0.1406	3.57	3.6220	1.7323	1.8898	0.1562	
MDW0360HGS8			0.1417	3.60	92.00	44.00	48.00	4.00	
MDW0370HGS8			0.1457	3.70	92.00	44.00	48.00	4.00	M4.5x.7
MDW0380HGS8	●		0.1496	3.80	92.00	44.00	48.00	4.00	
MDW0390HGS8			0.1535	3.90	92.00	44.00	48.00	4.00	
MDW01562HGS8	●	5/32	0.1562	3.97	3.6220	1.7323	1.8898	0.1562	
MDW0400HGS8	●		0.1575	4.00	92.00	44.00	48.00	4.0	
MDW01590HGS8	●	#21	0.1590	4.04	4.1339	1.9488	2.1260	0.1875	10-32
MDW0410HGS8			0.1614	4.10	105.00	49.50	54.00	5.00	
MDW0420HGS8	●		0.1654	4.20	105.00	49.50	54.00	5.00	M5x.8
MDW0430HGS8			0.1693	4.30	105.00	49.50	54.00	5.00	
MDW01719HGS8	●	11/64	0.1719	4.37	4.1339	1.9488	2.1260	0.1875	
MDW0440HGS8			0.1732	4.40	105.00	49.50	54.00	5.00	
MDW0450HGS8	●		0.1772	4.50	105.00	49.50	54.00	5.00	
MDW0460HGS8			0.1811	4.60	105.00	55.00	50.00	5.00	
MDW0470HGS8			0.1850	4.70	105.00	55.00	50.00	5.00	
MDW01875HGS8	●	3/16	0.1875	4.76	4.1339	2.1654	1.9685	0.1875	
MDW0480HGS8			0.1890	4.80	105.00	55.00	50.00	5.00	
MDW0490HGS8			0.1929	4.90	105.00	55.00	50.00	5.00	
MDW0500HGS8	●		0.1969	5.00	105.00	55.00	50.00	5.00	M6x1
MDW0510HGS8			0.2008	5.10	118.00	60.50	56.00	6.00	
MDW02010HGS8	●	#7	0.2010	5.11	4.6457	2.3819	2.2047	0.2344	1/4-20
MDW02031HGS8	●	13/64	0.2031	5.16	4.6457	2.3819	2.2047	0.2344	
MDW0520HGS8			0.2047	5.20	118.00	60.50	56.00	6.00	
MDW0530HGS8			0.2087	5.30	118.00	60.50	56.00	6.00	
MDW0540HGS8			0.2126	5.40	118.00	60.50	56.00	6.00	
MDW02130HGS8	●	#3	0.2130	5.41	4.6457	2.3819	2.2047	0.2344	
MDW0550HGS8	●		0.2165	5.50	118.00	60.50	56.00	6.00	
MDW02188HGS8	●	7/32	0.2188	5.56	4.6457	2.5984	2.0472	0.2344	1/4-28
MDW0560HGS8	●		0.2205	5.60	118.00	66.00	52.00	6.00	

● = USA stocked item ★ = Worldwide Warehouse item available in 10 business days
Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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MDW-HGS8 8XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length ℓ_1 (in/mm)	Shank Length ℓ_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW02210HGS8	•	#2	0.2210	5.61	4.6457	2.5984	2.0472	0.2344	
MDW0570HGS8			0.2244	5.70	118.00	66.00	52.00	6.0	
MDW0580HGS8			0.2283	5.80	118.00	66.00	52.00	6.0	
MDW0590HGS8			0.2323	5.90	118.00	66.00	52.00	6.0	
MDW02344HGS8	•	15/64	0.2344	5.95	4.6457	2.5984	2.0472	0.2344	
MDW0600HGS8	•		0.2362	6.00	118.00	66.00	52.00	6.00	M7x1
MDW0610HGS8			0.2402	6.10	130.00	71.50	53.00	7.00	
MDW0620HGS8			0.2441	6.20	130.00	71.50	53.00	7.00	
MDW0630HGS8			0.2480	6.30	130.00	71.50	53.00	7.00	
MDW02500HGS8	•	1/4	0.2500	6.35	5.1181	2.8150	2.0866	0.2812	
MDW0640HGS8			0.2520	6.40	130.00	71.50	53.00	7.00	
MDW0650HGS8	•		0.2559	6.50	130.00	71.50	53.00	7.00	
MDW02570HGS8	•	#F	0.2570	6.53	5.1181	3.0315	2.0866	0.2812	5/16-18
MDW0653HGS8			0.2571	6.53	130.00	77.00	53.00	7.00	
MDW0660HGS8			0.2598	6.60	130.00	77.00	53.00	7.00	
MDW0670HGS8			0.2638	6.70	130.00	77.00	53.00	7.00	
MDW02656HGS8	•	17/64	0.2656	6.75	5.1181	3.0315	2.0866	0.2812	
MDW02660HGS8	•	#H	0.2660	6.76	5.1181	3.0315	2.0866	0.2812	
MDW0680HGS8	•		0.2677	6.80	130.00	77.00	53.00	7.00	
MDW0690HGS8			0.2717	6.90	130.00	77.00	53.00	7.00	
MDW02720HGS8	•	#I	0.2720	6.91	5.1181	3.0315	2.0866	0.2812	5/16-24
MDW0700HGS8	•		0.2756	7.00	130.00	77.00	53.00	7.00	
MDW02770HGS8	•	#J	0.2770	7.04	5.1181	3.0315	2.0866	0.2812	
MDW0710HGS8			0.2795	7.10	142.00	82.50	54.00	8.00	
MDW02812HGS8	•	9/32	0.2812	7.14	5.1181	3.0315	2.0866	0.2812	
MDW0720HGS8			0.2835	7.20	142.00	82.50	54.00	8.00	
MDW0730HGS8			0.2874	7.30	142.00	82.50	54.00	8.00	
MDW0740HGS8			0.2913	7.40	142.00	82.50	54.00	8.00	
MDW0750HGS8	•		0.2953	7.50	142.00	82.50	54.00	8.00	
MDW02969HGS8	•	19/64	0.2969	7.54	5.5906	3.4646	2.1260	0.3125	
MDW0760HGS8			0.2992	7.60	142.00	88.00	54.00	8.00	
MDW0770HGS8			0.3031	7.70	142.00	88.00	54.00	8.00	
MDW0780HGS8			0.3071	7.80	142.00	88.00	54.00	8.00	M9x1.25
MDW0790HGS8			0.3110	7.90	142.00	88.00	54.00	8.00	
MDW03125HGS8	•	5/16	0.3125	7.94	5.5906	3.4646	2.1260	0.3125	3/8-16
MDW0800HGS8	•		0.3150	8.00	142.00	88.00	54.00	8.00	
MDW0810HGS8			0.3189	8.10	154.00	93.50	55.00	9.00	
MDW0820HGS8			0.3228	8.20	154.00	93.50	55.00	9.00	
MDW03230HGS8	•	#P	0.3230	8.20	6.0630	3.6811	2.1654	0.3594	
MDW0830HGS8			0.3268	8.30	154.00	93.50	55.00	9.00	
MDW03281HGS8	•	21/64	0.3281	8.33	6.0630	3.6811	2.1654	0.3594	
MDW0840HGS8			0.3307	8.40	154.00	93.50	55.00	9.00	
MDW03320HGS8	•	#Q	0.3320	8.43	6.0630	3.6811	2.1654	0.3594	
MDW0850HGS8	•		0.3346	8.50	154.00	93.50	55.00	9.00	M10x1.5
MDW0860HGS8			0.3386	8.60	154.00	99.00	55.00	9.00	
MDW0870HGS8			0.3425	8.70	154.00	99.00	55.00	9.00	
MDW03438HGS8	•	11/32	0.3438	8.73	6.0630	3.8976	2.1654	0.3594	

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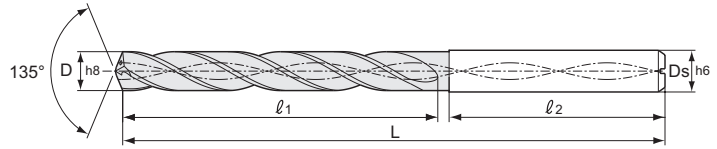
Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

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**MDW-HGS8 Series Solid Carbide
Coolant Through Drills**

**SERIES
MDW-HGS8**



(continued from previous page)

MDW-HGS8 8XD drill for excellent chip management and long tool life (Internal coolant)

Catalog Number (inch/metric)	Stock	Fractional Wire & Letters	Diameter D (in)	Diameter D (mm)	Overall Length L (in/mm)	Flute Length l_1 (in/mm)	Shank Length l_2 (in/mm)	Shank Diameter D_s (in/mm)	Tap Size
MDW0880HGS8			0.3465	8.80	154.00	99.00	55.00	9.00	
MDW0890HGS8			0.3504	8.90	154.00	99.00	55.00	9.00	
MDW0900HGS8	●		0.3543	9.00	154.00	99.00	55.00	9.00	
MDW0910HGS8			0.3583	9.10	166.00	104.50	56.00	10.00	
MDW03594HGS8	●	23/64	0.3594	9.13	6.0630	3.8976	2.1654	0.3594	
MDW0920HGS8			0.3622	9.20	166.00	104.50	56.00	10.00	
MDW0930HGS8			0.3661	9.30	166.00	104.50	56.00	10.00	
MDW03680HGS8	●	#U	0.3680	9.35	6.5354	4.1142	2.2047	0.3906	7/16-14
MDW0940HGS8			0.3701	9.40	166.00	104.50	56.00	10.00	
MDW0950HGS8	●		0.3740	9.50	166.00	104.50	56.00	10.00	
MDW03750HGS8	●	3/8	0.3750	9.53	6.5354	4.3307	2.2047	0.3906	
MDW0960HGS8			0.3780	9.60	166.00	110.00	56.00	10.00	
MDW0970HGS8			0.3819	9.70	166.00	110.00	56.00	10.00	
MDW0980HGS8			0.3858	9.80	166.00	110.00	56.00	10.00	
MDW0990HGS8			0.3898	9.90	166.00	110.00	56.00	10.00	
MDW03906HGS8	●	25/64	0.3906	9.92	6.5354	4.3307	2.2047	0.3906	
MDW1000HGS8	●		0.3937	10.00	166.00	110.00	56.00	10.00	
MDW1010HGS8			0.3976	10.10	182.00	115.50	61.00	11.00	
MDW1020HGS8			0.4016	10.20	182.00	115.50	61.00	11.00	M12x1.75
MDW1030HGS8	●		0.4055	10.30	182.00	115.50	61.00	11.00	
MDW04062HGS8	●	13/32	0.4062	10.32	7.1654	4.5472	2.4016	0.4375	
MDW1040HGS8			0.4094	10.40	182.00	115.50	61.00	11.00	
MDW1050HGS8	●		0.4134	10.50	182.00	115.50	61.00	11.00	
MDW1060HGS8			0.4173	10.60	182.00	121.00	61.00	11.00	
MDW1070HGS8			0.4213	10.70	182.00	121.00	61.00	11.00	
MDW04219HGS8	●	27/64	0.4219	10.72	7.1654	4.7638	2.4016	0.4375	1/2-13
MDW1080HGS8			0.4252	10.80	182.00	121.00	61.00	11.00	
MDW1090HGS8			0.4291	10.90	182.00	121.00	61.00	11.00	
MDW1100HGS8	●		0.4331	11.00	182.00	121.00	61.00	11.00	
MDW1110HGS8			0.4370	11.10	194.00	126.50	62.00	12.00	
MDW04375HGS8	●	7/16	0.4375	11.11	7.1654	4.7638	2.4016	0.4375	
MDW1120HGS8			0.4409	11.20	194.00	126.50	62.00	12.00	
MDW1130HGS8			0.4449	11.30	194.00	126.50	62.00	12.00	
MDW1140HGS8			0.4488	11.40	194.00	126.50	62.00	12.00	
MDW1150HGS8	●		0.4528	11.50	194.00	126.50	62.00	12.00	
MDW04531HGS8	●	29/64	0.4531	11.51	7.6378	5.1969	2.4409	0.4688	1/2-20
MDW1160HGS8			0.4567	11.60	194.00	132.00	62.00	12.00	
MDW1170HGS8			0.4606	11.70	194.00	132.00	62.00	12.00	
MDW1180HGS8			0.4646	11.80	194.00	132.00	62.00	12.00	
MDW1190HGS8			0.4685	11.90	194.00	132.00	62.00	12.00	
MDW04688HGS8	●	15/32	0.4688	11.91	7.6378	5.1969	2.4409	0.4688	
MDW1200HGS8	●		0.4724	12.00	194.00	132.00	62.00	12.00	M14x2
MDW1210HGS8			0.4764	12.10	206.00	137.50	63.00	13.00	
MDW1220HGS8			0.4803	12.20	206.00	137.50	63.00	13.00	
MDW1230HGS8			0.4843	12.30	206.00	137.50	63.00	13.00	9/16-12
MDW04844HGS8	●	31/64	0.4844	12.30	8.1102	5.4134	2.4803	0.5156	
MDW1240HGS8			0.4882	12.40	206.00	137.50	63.00	13.00	

●=USA stocked item ★=Worldwide Warehouse item available in 10 business days

Some drills can achieve greater depths. Always check for sufficient flute length. Note: Special diameters available upon request.

(continued on next page)



MDW		Work Material	Hardness HB	Speed = SFM Feed = IPR	Drill Diameter (inch)		
					ø < - ø0.196	ø0.197 - ø0.394	ø0.395 - ø0.630
GS 2D 4D	P	Low Carbon Steel	<190	SFM	110 - 250	160 - 275	210 - 360
				IPR	.004 - .008	.006 - .010	.008 - .012
			190 ~ 250	SFM	110 - 250	160 - 275	210 - 360
				IPR	.004 - .008	.006 - .010	.008 - .012
			250 ~ 300	SFM	100 - 225	140 - 250	190 - 325
				IPR	.003 - .006	.004 - .008	.006 - .010
		Medium Carbon Steel	180 ~ 275	SFM	110 - 250	160 - 275	210 - 360
				IPR	.004 - .008	.006 - .010	.008 - .012
			275 ~ 350	SFM	100 - 225	140 - 250	190 - 325
				IPR	.003 - .006	.004 - .008	.006 - .010
			200	SFM	110 - 250	160 - 275	210 - 360
				IPR	.004 - .008	.006 - .010	.008 - .012
	350	SFM	80 - 210	115 - 220	115 - 250		
		IPR	.003 - .006	.004 - .008	.006 - .010		
	M	300 Austenitic Stainless Steel	160 ~ 280	SFM	50 - 115	60 - 160	80 - 210
				IPR	.002 - .006	.003 - .008	.004 - .010
	K	Cast Iron	160 ~ 240	SFM	60 - 120	75 - 180	90 - 225
				IPR	.002 - .006	.003 - .008	.006 - .010
	H	Hardened Steel	45-60 Rc	SFM	115 - 300	195 - 390	250 - 415
				IPR	.006 - .010	.006 - .014	.006 - .014
	S	Titanium Alloy Ti-6Al-4V	45-60 Rc	SFM	115 - 185	160 - 300	210 - 375
				IPR	.006 - .010	.006 - .014	.006 - .014
	N	Aluminum alloy	45-60 Rc	SFM	40 - 60	40 - 80	50 - 100
				IPR	.002 - .004	.003 - .006	.004 - .008
M	400 Martensitic Stainless Steel	160 ~ 240	SFM	40 - 80	40 - 100	50 - 110	
			IPR	.003 - .004	.003 - .005	.003 - .006	
K	Ductile Iron	160 ~ 240	SFM	30 - 60	30 - 60	40 - 80	
			IPR	.002 - .003	.003 - .005	.003 - .006	
H	Hardened Steel	45-60 Rc	SFM	300 - 700	400 - 800	400 - 800	
			IPR	.003 - .006	.004 - .008	.006 - .012	
S	Exotics - Inconel, Monel	45-60 Rc	SFM	300 - 700	400 - 800	400 - 800	
			IPR	.003 - .006	.004 - .008	.006 - .010	
N	Copper Alloy	45-60 Rc	SFM	300 - 700	400 - 800	400 - 800	
			IPR	.003 - .006	.004 - .008	.006 - .010	

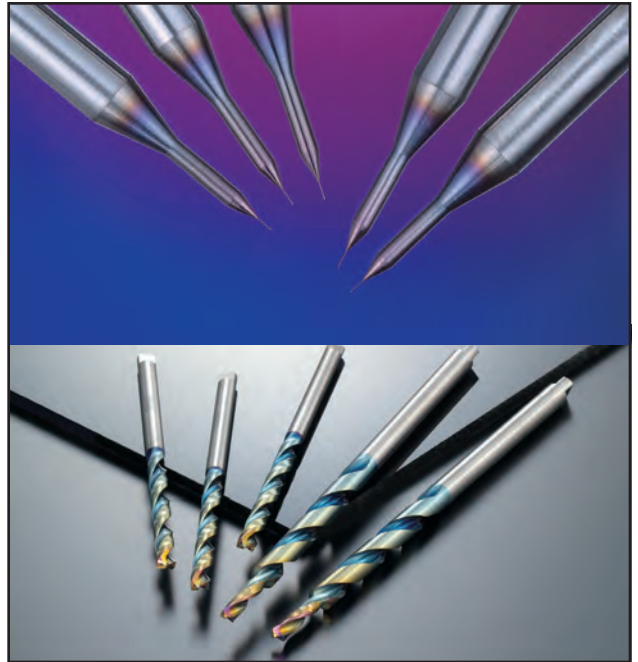
MDW		Work Material	Hardness HB	Speed = SFM Feed = IPR	Drill Diameter (inch)			
					ø < - ø0.196	ø0.197 - ø0.394	ø0.395 - ø0.630	
HGS 3D 5D 8D	P	Low Carbon Steel	<190	SFM	300 - 475	400 - 550	450 - 650	
				IPR	.004 - .008	.006 - .010	.008 - .014	
			190 ~ 250	SFM	225 - 425	265 - 530	425 - 625	
				IPR	.004 - .008	.006 - .010	.008 - .014	
			250 ~ 300	SFM	175 - 375	225 - 495	250 - 525	
				IPR	.003 - .006	.004 - .008	.006 - .012	
		Medium Carbon Steel	180 ~ 275	SFM	225 - 425	265 - 530	350 - 575	
				IPR	.004 - .008	.006 - .010	.008 - .014	
			275 ~ 350	SFM	175 - 375	225 - 495	305 - 525	
				IPR	.003 - .006	.004 - .008	.006 - .012	
			200	SFM	190 - 380	225 - 475	275 - 525	
				IPR	.003 - .006	.004 - .008	.006 - .010	
		350	SFM	125 - 300	155 - 325	155 - 350		
			IPR	.003 - .006	.004 - .008	.006 - .010		
		M	300 Austenitic Stainless Steel	160 ~ 280	SFM	120 - 225	150 - 325	150 - 325
					IPR	.002 - .006	.004 - .010	.006 - .012
		K	Cast Iron	160 ~ 240	SFM	120 - 250	175 - 350	175 - 350
					IPR	.002 - .006	.004 - .010	.006 - .012
	H	Hardened Steel	45-60 Rc	SFM	150 - 380	250 - 475	275 - 530	
				IPR	.006 - .010	.006 - .014	.006 - .014	
	S	Titanium Alloy Ti-6Al-4V	45-60 Rc	SFM	150 - 350	225 - 450	250 - 500	
				IPR	.006 - .010	.006 - .014	.006 - .014	
	N	Aluminum alloy	45-60 Rc	SFM	60 - 190	80 - 225	80 - 225	
				IPR	.002 - .004	.003 - .006	.004 - .008	
	M	400 Martensitic Stainless Steel	160 ~ 240	SFM	65 - 130	80 - 130	80 - 160	
				IPR	.003 - .004	.003 - .005	.003 - .006	
	K	Ductile Iron	160 ~ 240	SFM	40 - 85	40 - 100	50 - 120	
				IPR	.002 - .003	.003 - .005	.003 - .006	
	H	Hardened Steel	45-60 Rc	SFM	500 - 800	600 - 1000	600 - 1000	
				IPR	.003 - .006	.004 - .008	.006 - .012	
S	Exotics - Inconel, Monel	45-60 Rc	SFM	400 - 800	500 - 800	500 - 800		
			IPR	.003 - .006	.004 - .008	.006 - .010		
N	Copper Alloy	45-60 Rc	SFM	400 - 800	500 - 800	500 - 800		
			IPR	.003 - .006	.004 - .008	.006 - .010		

Solid Carbide Drills



SMALL DIAMETER & DLC COATED DRILLS

Pages 441-447



MicroDrills/DLC Coated Drills

SMALL DIA. & DLC COATED DRILLS	PAGES
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Small Diameter Drills

MLDH Type	442-443
MDUS Type	444
MDSS Type	445-446

DLC Coated Drills

NHGS Type	447
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Micro Long Drills MLDH-L / MLDH-P Type



■ General Features

Micro Long Drills are oil-hole drills for high efficiency drilling that were developed for drilling deep, small-diameter holes. These next-generation, small-diameter hole drills feature improved strength - often a problem area with small-diameter drills.

■ Characteristics and Applications

● Deep-hole drilling

New groove shape ensures good drill rigidity and chip evacuation.

High efficiency drilling to depths of over 20x drill diameter at over $v_f=500\text{mm/min}$ (drill diameter 1.3mm, SUS416 equivalent).

Optimal thinning and edge balance for stable chip control.

● Long tool life

Special coating provides long tool life with a wide variety of work materials.

Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring stable tool life.

■ Series

Application	Series	Diameter Range (mm)	Hole Depth (l/d)	Remarks
Deep Hole Drilling	MLDH□□□□L5 Type	ø0.8 to 2.0	Up to 5	41 Models Stocked
	MLDH□□□□L12 Type	ø0.8 to 2.0	Up to 12	41 Models Stocked
	MLDH□□□□L20 Type	ø0.8 to 2.0	Up to 20	41 Models Stocked
	MLDH□□□□L30 Type	ø0.8 to 2.0	Up to 30	41 Models Stocked
Guide Hole Drilling	MLDH□□□□P Type	ø0.8 to 2.0	Up to 2	41 Models Stocked

■ Recommended Cutting Conditions

MLDH-P Type/MLDH-L5 Type

(v_c : Cutting Speed m/min f : Feed Rate mm/rev)

Drill Diameter ϕD_c (mm)	Cutting Conditions	Soft Steel Up to 200HB	General Steel Up to 250HB	Alloy Steel Up to 300HB	Stainless Steel Up to 200HB	Cast Iron FC/FCD	Aluminium Alloy	Heat-resistant steels
Up to 1.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
Up to 1.5	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.02 - 0.05 - 0.10	0.04 - 0.08 - 0.12	0.05 - 0.10 - 0.15	0.01 - 0.03 - 0.05
Up to 2.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.04 - 0.06 - 0.10	0.06 - 0.08 - 0.12	0.08 - 0.12 - 0.15	0.01 - 0.03 - 0.05

Min. - **Optimum** - Max.

MLDH-L12 Type/MLDH-L20 Type/MLDH-L30 Type

Drill Diameter ϕD_c (mm)	Cutting Conditions	Soft Steel Up to 200HB	General Steel Up to 250HB	Alloy Steel Up to 300HB	Stainless Steel Up to 200HB	Cast Iron FC/FCD	Aluminium Alloy	Heat-resistant steels
Up to 1.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
Up to 1.5	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.02 - 0.04 - 0.07	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03
Up to 2.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03

Min. - **Optimum** - Max.

■ Application Examples

● Automotive Component Mould (Equivalent to SUS416)

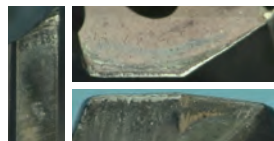
Tool : MLDH1400L20 (Guide : MLDH1400P)

Equipment : Vertical Machining Centre (HSKA63)

Coolant Supply : Internal Coolant (Emulsion Type, Pump Pressure : 4MPa)

Cutting Conditions : $v_c=60\text{m/min}$ $f=0.03\text{mm/rev}$ $H=21\text{mm}$

Tool Life : **600 Units (11.4m/reg)**



● Tooling Component (Equivalent to SKD11)

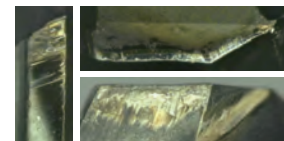
Tool : MLDH1900L20 (Guide : MLDH1900P)

Equipment : Vertical Machining Centre (HSKA63)

Coolant Supply : Internal Coolant (Emulsion Type, Pump Pressure : 4MPa)

Cutting Conditions : $v_c=60\text{m/min}$ $f=0.10\text{mm/rev}$ $H=27\text{mm}$

Tool Life : **600 Units (18m/reg)**



New

MLDH-P Type



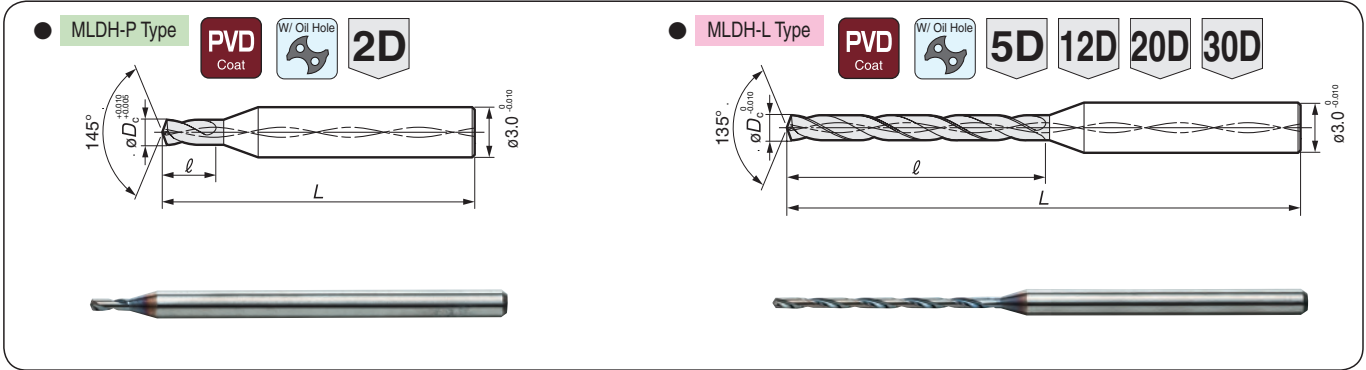
MLDH-L Type



Micro Long Drills MLDH-L / MLDH-P Type

Internal Coolant Supply (MLDH-P Type / MLDH-L Type)

Carbon Steel	Alloy Steel	Tempered Steel	Hardened Steel	Stainless steel	Ti Alloy	Heat-resistant steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper alloy	Composite CFRP
Up to 0.28%	From 0.28%		Up to 45HRC From 48HRC								



MLDH-P Type/MLDH-L Type Dimensions and Stock Availability

Diameter ϕD_c (mm)	Dedicated Guide Hole MLDH-P Type			Micro Long Drill MLDH-L Type											
	Cat. No.	Stock	Dimensions (mm)	Cat. No. 5, 12, 20, 30	Hole Depth: 5D		Hole Depth: 12D		Hole Depth: 20D		Hole Depth: 30D				
					Stock	Dimensions (mm)	Stock	Dimensions (mm)	Stock	Dimensions (mm)	Stock	Dimensions (mm)			
0.80	MLDH 0800P	★	3.2	MLDH 0800L	★	8	★	14	★	19	★	28			
0.81	0810P	★		0810L	★		★		★						
0.82	MLDH 0820P	★	3.3	MLDH 0820L	★	9	★	14	★	20	★	29			
0.83	0830P	★		0830L	★		★		★						
0.84	MLDH 0840P	★	3.4	MLDH 0840L	★	9	★	15	★	21	★	30			
0.85	0850P	★		0850L	★		★		★						
0.86	0860P	★	3.5	MLDH 0870L	★	10	★	16	★	23	★	33			
0.87	MLDH 0870P	★		0880L	★		★		★						
0.88	0880P	★	3.6	MLDH 0890L	★	10	★	17	★	24	★	34			
0.89	MLDH 0890P	★		0900L	★		★		★						
0.90	0900P	★	3.7	MLDH 0920L	★	11	★	18	★	25	★	36			
0.91	0910P	★		0930L	★		★		★						
0.92	MLDH 0920P	★	3.8	MLDH 0940L	★	12	★	19	★	26	★	37			
0.93	0930P	★		0950L	★		★		★						
0.94	MLDH 0940P	★	3.9	MLDH 0970L	★	13	★	20	★	28	★	39			
0.95	0950P	★		0980L	★		★		★						
0.96	0960P	★	4.0	MLDH 0990L	★	14	★	21	★	30	★	43			
0.97	MLDH 0970P	★		1000L	★		★		★						
0.98	0980P	★	4.2	MLDH 1050L	★	15	★	22	★	31	★	44			
0.99	MLDH 0990P	★		1100L	★		★		★						
1.00	1000P	★	4.4	MLDH 1150L	★	16	★	23	★	32	★	46			
1.05	MLDH 1050P	★		1200L	★		★		★						
1.10	MLDH 1100P	★	4.6	MLDH 1200L	★	17	★	24	★	34	★	48			
1.15	MLDH 1150P	★		MLDH 1250L	★		★		★						
1.20	MLDH 1200P	★	4.8	MLDH 1300L	★	18	★	25	★	35	★	49			
1.25	MLDH 1250P	★		MLDH 1350L	★		★		★						
1.30	MLDH 1300P	★	5.0	MLDH 1400L	★	19	★	26	★	36	★	51			
1.35	MLDH 1350P	★		MLDH 1450L	★		★		★						
1.40	MLDH 1400P	★	5.2	MLDH 1500L	★	20	★	27	★	38	★	54			
1.45	MLDH 1450P	★		MLDH 1550L	★		★		★						
1.50	MLDH 1500P	★	5.4	MLDH 1600L	★	21	★	28	★	40	★	56			
1.55	MLDH 1550P	★		MLDH 1650L	★		★		★						
1.60	MLDH 1600P	★	5.6	MLDH 1700L	★	22	★	29	★	41	★	58			
1.65	MLDH 1650P	★		MLDH 1750L	★		★		★						
1.70	MLDH 1700P	★	5.8	MLDH 1800L	★	23	★	30	★	42	★	60			
1.75	MLDH 1750P	★		MLDH 1850L	★		★		★						
1.80	MLDH 1800P	★	6.0	MLDH 1900L	★	24	★	31	★	43	★	61			
1.85	MLDH 1850P	★		MLDH 1950L	★		★		★						
1.90	MLDH 1900P	★	6.2	MLDH 2000L	★	25	★	32	★	44	★	63			
1.95	MLDH 1950P	★		MLDH 2000L	★		★		★						
2.00	MLDH 2000P	★	6.4	MLDH 2000L	★	26	★	33	★	46	★	65			
				MLDH 2000L	★		★		★						
			6.6	MLDH 2000L	★	27	★	34	★	47	★	66			
				MLDH 2000L	★		★		★						
			6.8	MLDH 2000L	★	28	★	35	★	48	★	68			
				MLDH 2000L	★		★		★						

Please indicate 5, 12, 20 or 30 in the when ordering.
(Example: MLDH 1000L20)

Grade: ACV70

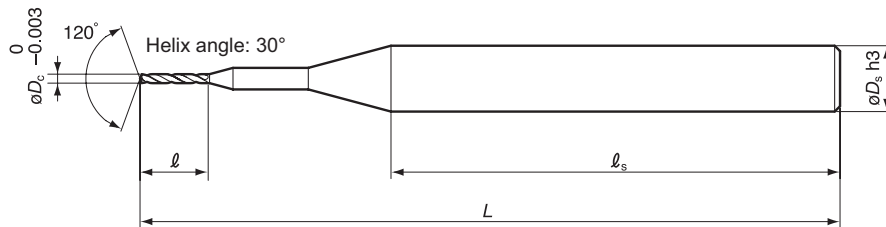
■ Made to Order Items: Inquire about production of drills in tool diameters and lengths not listed above or not in stock.





■ MDUS-Features & Benefits

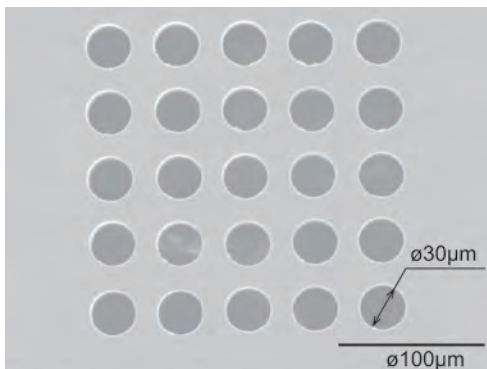
- **High precision shank**
Shank tolerance: h3
Concentricity: 0.3µm or less
Roundness: 0.5µm or less
- **New ultra-thin TiAlN coating**
Provides improved wear resistance
- **Wide material range**
Ideal for machining steel, stainless steel, and copper



ø0.030 to ø0.180mm

Catalog Number	øDc (mm)	øDs (mm)	Stock	Dimensions (mm)		
				l	ls	L
MDUS0030-30C	0.030	3.0	★	0.3	28	38
MDUS0040-30C	0.040		★	0.4		
MDUS0050-30C	0.050		★	0.5		
MDUS0080-30C	0.080		★	0.8		
MDUS0100-30C	0.100		★	1.0		
MDUS0120-30C	0.120		★	1.2		
MDUS0150-30C	0.150		★	1.5		
MDUS0180-30C	0.180		★	1.8		

★ = Worldwide Warehouse item available in 10 business days



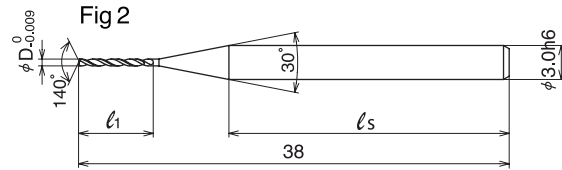
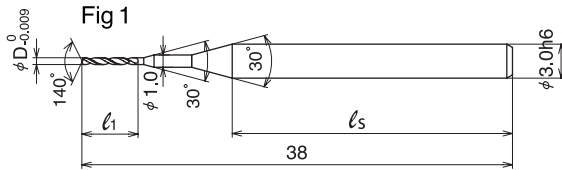
Material: 304 Stainless Steel
Drill: MDUS0030-30C (ø0.03mm)





■ Features & Benefits

- High breakage resistance due to a combination of tough, stable carbide substrate and a highly rigid design
- Long tool life is achieved as a result of the PVD coating created especially for small diameter drills
- Wide variety of applications including carbon steel, alloy steel, die steel, and stainless steel



ø0.20 to ø0.49mm

Catalog Number	Stock	øDc (mm)	Dimensions (mm)		Style
			ℓ	ℓ _s	
MDSS0020	★	0.20	2.5	28	Fig1
MDSS0021	★	0.21			
MDSS0022	★	0.22			
MDSS0023	★	0.23			
MDSS0024	★	0.24			
MDSS0025	★	0.25			
MDSS0026	★	0.26			
MDSS0027	★	0.27			
MDSS0028	★	0.28			
MDSS0029	★	0.29	4	28	Fig1
MDSS0030	★	0.30			
MDSS0031	★	0.31			
MDSS0032	★	0.32			
MDSS0033	★	0.33			
MDSS0034	★	0.34			
MDSS0035	★	0.35			
MDSS0036	★	0.36			
MDSS0037	★	0.37			
MDSS0038	★	0.38	5	28	Fig2
MDSS0039	★	0.39			
MDSS0040	★	0.40			
MDSS0041	★	0.41			
MDSS0042	★	0.42			
MDSS0043	★	0.43			
MDSS0044	★	0.44			
MDSS0045	★	0.45			
MDSS0046	★	0.46			
MDSS0047	★	0.47			
MDSS0048	★	0.48			
MDSS0049	★	0.49			

ø0.50 to ø0.79mm

Catalog Number	Stock	øDc (mm)	Dimensions (mm)		Style
			ℓ	ℓ _s	
MDSS0050	★	0.50	6	27	Fig2
MDSS0051	★	0.51			
MDSS0052	★	0.52			
MDSS0053	★	0.53			
MDSS0054	★	0.54			
MDSS0055	★	0.55			
MDSS0056	★	0.56			
MDSS0057	★	0.57			
MDSS0058	★	0.58			
MDSS0059	★	0.59	7	26	Fig2
MDSS0060	★	0.60			
MDSS0061	★	0.61			
MDSS0062	★	0.62			
MDSS0063	★	0.63			
MDSS0064	★	0.64			
MDSS0065	★	0.65			
MDSS0066	★	0.66			
MDSS0067	★	0.67			
MDSS0068	★	0.68	9	24	Fig2
MDSS0069	★	0.69			
MDSS0070	★	0.70			
MDSS0071	★	0.71			
MDSS0072	★	0.72			
MDSS0073	★	0.73			
MDSS0074	★	0.74			
MDSS0075	★	0.75			
MDSS0076	★	0.76			
MDSS0077	★	0.77			
MDSS0078	★	0.78			
MDSS0079	★	0.79			

★ = Worldwide Warehouse item available in 10 business days

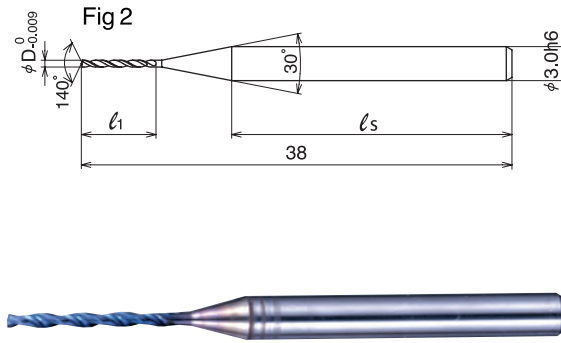
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ø0.80 to ø1.00mm

Catalog Number	Stock	øDc (mm)	Dimensions (mm)		Style
			ℓ	ℓ _s	
MDSS0080	★	0.80	10	23	Fig2
MDSS0081	★	0.81			
MDSS0082	★	0.82			
MDSS0083	★	0.83			
MDSS0084	★	0.84			
MDSS0085	★	0.85			
MDSS0086	★	0.86			
MDSS0087	★	0.87			
MDSS0088	★	0.88			
MDSS0089	★	0.89			
MDSS0090	★	0.90	11	22	Fig2
MDSS0091	★	0.91			
MDSS0092	★	0.92			
MDSS0093	★	0.93			
MDSS0094	★	0.94			
MDSS0095	★	0.95			
MDSS0096	★	0.96			
MDSS0097	★	0.97			
MDSS0098	★	0.98			
MDSS0099	★	0.99			
MDSS0100	★	1.00	12	21	



★ = Worldwide Warehouse item available in 10 business days

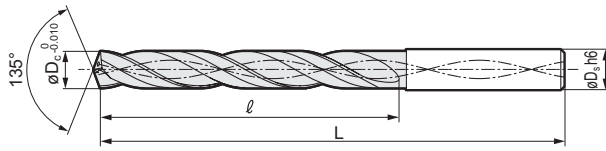
Recommended Cutting Conditions (Wet)

Feed Rate=ipm / mm/min		Structural Steel	Alloy Steel	Die Steel	Hardened Steel	Hardened Steel	Ductile Cast Iron	Stainless Steel
		Carbon Steel Gray Cast Iron	Pre-hardened Steel	Tempered Steel	40-50 HRc	50-55 HRc		
~ø.20 - ø.29 mm	RPM	31,800	26,500	21,200	12,700	10,600	31,800	10,600
	Feed Rate	2.362 / 60	1.969 / 50	1.575 / 40	1.181 / 30	0.787 / 20	2.362 / 60	0.787 / 20
	Step Feed	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD
~ø.30 - .39 mm	RPM	31,800	26,500	21,200	12,700	10,600	31,800	10,600
	Feed Rate	3.937 / 100	3.150 / 80	2.362 / 60	1.575 / 40	1.181 / 30	3.937 / 100	1.181 / 30
	Step Feed	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD
~ø.40 - .49 mm	RPM	31,800	25,900	19,900	12,700	9,900	31,800	9,500
	Feed Rate	5.118 / 130	3.937 / 100	3.150 / 80	1.969 / 50	1.575 / 40	5.118 / 130	1.575 / 40
	Step Feed	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD
~ø.50 - .59 mm	RPM	31,800	25,500	19,100	12,700	9,500	31,800	9,500
	Feed Rate	7.480 / 190	5.906 / 150	4.330 / 110	2.362 / 60	1.969 / 50	7.480 / 190	1.969 / 50
	Step Feed	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD	0.1XD
~ø.60 - 1.00 mm	RPM	23,900	15,900	12,700	8,000	5,600	19,100	5,600
	Feed Rate	14.173 / 360	9.449 / 240	3.543 / 90	3.937 / 100	2.362 / 60	11.417 / 290	3.150 / 80
	Step Feed	0.2XD	0.2XD - .5XD*	0.2XD - .5XD*	0.1XD	0.1XD	0.2XD - .5XD*	0.1XD

* Step feed is recommended for drilling of holes deeper than 3XD

- 1) The conditions above are recommended under wet conditions, using water-soluble coolant.
- 2) If machine noises and vibrations are present, adjust the cutting conditions accordingly.
- 3) If the machine cannot achieve the recommended spindle speed, use the maximum spindle speed available.





Diameter $\phi 3.00$ to 8.00 mm (5XD)

Catalog Number	ϕD_c (mm)	ϕD_s (mm)	Stock	Dimensions (mm)	
				ℓ	L
MDW0300NHGS5	3.00	3.0	★	28	78
MDW0340NHGS5	3.40	4.0	★	32	86
MDW0350NHGS5	3.50		★		
MDW0365NHGS5	3.65		★		
MDW0380NHGS5	3.80		★		
MDW0400NHGS5	4.00	★	36	98	
MDW0430NHGS5	4.30	5.0	★		40
MDW0450NHGS5	4.50		★		
MDW0460NHGS5	4.60		★		
MDW0500NHGS5	5.00		★		
MDW0510NHGS5	5.10	6.0	★	44	100
MDW0550NHGS5	5.50		★		
MDW0600NHGS5	6.00		★		
MDW0610NHGS5	6.10	7.0	★	52	109
MDW0650NHGS5	6.50		★		
MDW0680NHGS5	6.80		★		
MDW0700NHGS5	7.00		★		
MDW0735NHGS5	7.35	8.0	★	60	118
MDW0750NHGS5	7.50		★		
MDW0780NHGS5	7.80		★		
MDW0800NHGS5	8.00		★		

Diameter $\phi 8.50$ to 16.00 mm (5XD)

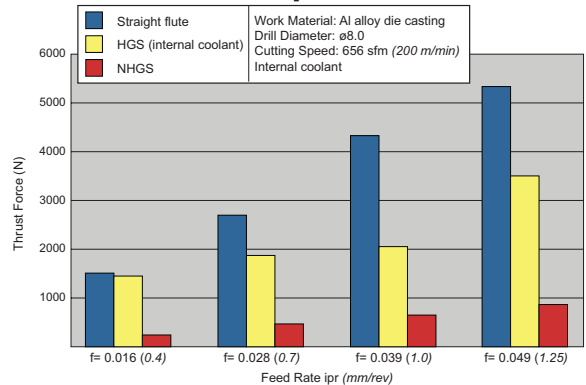
Catalog Number	ϕD_c (mm)	ϕD_s (mm)	Stock	Dimensions (mm)	
				ℓ	L
MDW0850NHGS5	8.50	9.0	★	68	127
MDW0860NHGS5	8.60		★		
MDW0900NHGS5	9.00		★		
MDW0921NHGS5	9.21	10.0	★	76	136
MDW0950NHGS5	9.50		★		
MDW0960NHGS5	9.60		★		
MDW1000NHGS5	10.00		★		
MDW1040NHGS5	10.40	11.0	★	84	149
MDW1050NHGS5	10.50		★		
MDW1100NHGS5	11.00		★		
MDW1110NHGS5	11.10	12.0	★	92	158
MDW1150NHGS5	11.50		★		
MDW1200NHGS5	12.00		★		
MDW1210NHGS5	12.10	13.0	★	100	167
MDW1250NHGS5	12.50		★		
MDW1300NHGS5	13.00		★		
MDW1350NHGS5	13.50	14.0	★	108	176
MDW1400NHGS5	14.00		★		
MDW1410NHGS5	14.10	15.0	★	116	185
MDW1450NHGS5	14.50		★		
MDW1490NHGS5	14.90		★		
MDW1500NHGS5	15.00		★		
MDW1550NHGS5	15.50	16.0	★	124	194
MDW1600NHGS5	16.00		★		

★ = Worldwide Warehouse item available in 10 business days

■ Features & Benefits

- **High efficiency drilling**
DLC or "diamond like carbon" coating along with special web thinning drastically reduce cutting resistance
- **Precision drilling**
Special cutting edge design improves hole quality
- **Longer tool life**
DLC coating and cutting edge design provide long and stable tool life
- **For a wide variety of work material**
Die cast aluminum, aluminum casting, wrought aluminum alloy, brass casting, and bronze casting

■ Thrust Force Comparison



■ Recommended Running Conditions

Speed: v (m/min)
Feed: f (mm/rev)

Drill Diameter	Aluminum Casting/ Die Cast Aluminum		Wrought Aluminum Alloy
	Up to $\phi 6.00$	v	80 - 200
	f	0.2 - 0.5	0.2 - 0.3
Up to $\phi 10.00$	v	100 - 250	100 - 250
	f	0.4 - 0.8	0.2 - 0.4
Up to $\phi 16.00$	v	120 - 250	120 - 250
	f	0.4 - 1.0	0.3 - 0.5





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DEEP HOLE CARBIDE DRILLS

Pages 449-455



Deep Hole
Carbide
Drills

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FEATURES & BENEFITS

MDW-XHV

MDW-XHV Deep Hole Carbide Drills

Features & Benefits



■ Features & Benefits

- **Deep hole drilling**
New flute shape with improved chip evacuation during deep drilling. High-efficiency drilling to depths of over 30 times drill diameter ($V_f = 28$ IPM). Stable deep hole drilling with double margin design.
- **Longer tool life**
Special DEX coating provides long tool life in a variety of work material.
- **Eco-friendly**
Compatible with the MQL (Minimum Quantity Lubrication) system.

■ Application Examples

• **Automotive Component**
1045 steel (250HB)

Machine: Horizontal single axis NC machine
Coolant: MQL Air pressure 0.9MPa
MQL Volume Approx. 1cc/H

Pilot hole:

- $\phi 0.23 \times 0.47$ in ($\phi 5.73 \times 12$ mm)
- Drill point angle: 150°
- $V_c = 262.5$ SFM (80m/min)
- $f = 0.008$ IPR (0.20mm/min)

Deep hole:

- $\phi 0.22 \times 3.27$ in ($\phi 5.7 \times 83$ mm)
- $V_c = 262.5$ SFM (80m/min)
- $f = 0.010$ IPR (0.25mm/min)
- $V_f = 44$ IPM (1117mm/min)

⇒ **Tool Life: 250 parts**

• **Automotive Component**
Gray cast iron

Machine: Horizontal single axis NC machine
Coolant: MQL (volume 3cc/H) Air discharge 0.45 MPa

Pilot hole:

- $\phi 0.30 \times 0.51$ in ($\phi 7.63 \times 13$ mm)
- Drill point angle: 150°
- $V_c = 262.5$ SFM (80m/min)
- $f = 0.010$ IPR (0.25mm/min)

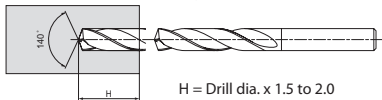
Deep hole:

- $\phi 0.30 \times 9.10$ in ($\phi 7.60 \times 230$ mm)
- $V_c = 197$ SFM (60m/min)
- $f = 0.011$ IPR (0.30mm/min)
- $V_f = 29.70$ IPM (754mm/min)

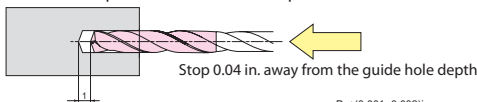
⇒ **Tool Life: 500 parts**

■ Recommended Drilling Method

1. **Make a guide hole using the MDS-V type drill**
• Use a guide hole MDS-V style drill with diameter the same as the MDW-XHV type

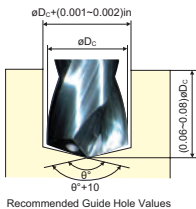


2. Feed the MDW-XHV type through the guide hole at low rotation speed
• Rotation: 500 rpm Feed Rate: 40 - 80 ipm

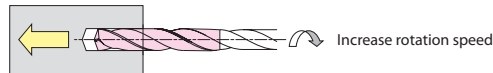


OTHER NOTES

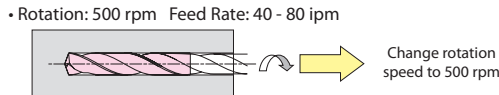
- A flat base should be prepared when the surface for the guide tool is slanted
- When drilling through a slanted surface, reduce the drill feed to 0.002 ipm before the drill exits



3. Increase rotation speed until the set rotation speed is reached and start normal drilling



4. After drilling, rotation speed is reduced and the drill is retracted from the work material



COOLANT

- Internal Coolant
(Water Soluble): Pump Pressure Steel: 200-300 PSI
Cast Iron or Aluminum: 500-1000 PSI
- Internal MQL: Air Pressure: 50-100 PSI or above
Volume (Edge)

■ Recommended Cutting Conditions

$V_c = \text{sfm} / \text{m/min}$
 $f = \text{ipr} / \text{mm/rev}$

	General Steel (>300HB)	Hardened Steel (>45HRC)	Stainless Steel (>200HB)	Gray Cast Iron	Ductile Iron	
~ $\phi 0.125$ in ~ $\phi 3.0$ mm	Vc	165~330 / 50~100	65~130 / 20~40	100~165 / 30~50	165~295 / 50~90	130~260 / 40~80
	f	0.003~0.006 / 0.08~0.15	0.002~0.003 / 0.06~0.05	0.002~0.005 / 0.06~0.12	0.006~0.010 / 0.15~0.25	0.005~0.008 / 0.12~0.20
$\phi 0.125 \sim \phi 0.203$ in $\phi 3.1 \sim \phi 5.0$ mm	Vc	260~395 / 80~120	65~130 / 20~40	100~195 / 30~60	165~295 / 50~90	130~260 / 40~80
	f	0.006~0.010 / 0.15~0.25	0.003~0.004 / 0.08~0.10	0.003~0.006 / 0.08~0.15	0.006~0.012 / 0.15~0.30	0.006~0.010 / 0.15~0.25
$\phi 0.203 \sim \phi 0.406$ in $\phi 5.1 \sim \phi 10.0$ mm	Vc	260~395 / 80~120	65~130 / 20~40	130~260 / 40~80	195~330 / 60~100	165~295 / 50~90
	f	0.008~0.014 / 0.20~0.35	0.004~0.006 / 0.10~0.15	0.004~0.008 / 0.10~0.20	0.008~0.014 / 0.20~0.35	0.008~0.014 / 0.20~0.35
$\phi 0.406 \sim \phi 0.625$ in $\phi 10.1 \sim \phi 16.0$ mm	Vc	260~425 / 80~130	65~130 / 20~40	165~260 / 50~80	230~395 / 70~120	195~330 / 60~100
	f	0.010~0.014 / 0.25~0.35	0.004~0.006 / 0.10~0.15	0.004~0.008 / 0.10~0.20	0.010~0.014 / 0.25~0.35	0.010~0.014 / 0.25~0.35

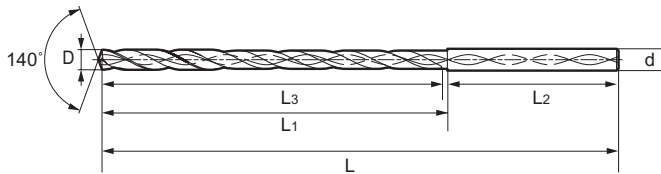


**MDW-XHV Deep Hole
Carbide Coolant Through Drills**

**12XD-INCH
MDW-XHV**



Tolerance of Diameters	
øD	Tolerance
.1181 < øD ≤ .2362	-.00080 -.00145
.2362 < øD ≤ .3937	-.00080 -.00165
.3937 < øD ≤ .7087	-.00080 -.00185



12XD-INCH

Catalog Number	Stock	Cutting Dia.		L	L1	L2	L3	d
		Fraction	Decimal					
MDW1250XHV12	●	1/8"	0.125	3.780	1.890	1.890	1.772	0.157
MDW1406XHV12	●	9/64"	0.141	4.134	2.244	1.890	2.126	0.157
MDW1563XHV12	●	5/32"	0.156	4.370	2.480	1.890	2.362	0.157
MDW1719XHV12	●	11/64"	0.172	4.607	2.638	1.969	2.520	0.236
MDW1875XHV12	●	3/16"	0.188	5.158	3.189	1.969	3.071	0.236
MDW2031XHV12	●	13/64"	0.203	5.158	3.189	1.969	3.071	0.236
MDW2131XHV12	●	#3	0.213	5.158	3.189	1.969	3.071	0.236
MDW2187XHV12	●	7/32"	0.219	5.433	3.465	1.969	3.346	0.236
MDW2500XHV12	●	1/4"	0.250	6.102	4.055	2.047	3.937	0.315
MDW2570XHV12	●	#F	0.257	6.102	4.055	2.047	3.937	0.315
MDW2656XHV12	●	17/64"	0.266	6.102	4.055	2.047	3.937	0.315
MDW2813XHV12	●	9/32"	0.281	6.496	4.449	2.047	4.331	0.315
MDW2969XHV12	●	19/64"	0.297	6.496	4.449	2.047	4.331	0.315
MDW3125XHV12	●	5/16"	0.313	6.496	4.449	2.047	4.331	0.315
MDW3320XHV12	●	#Q	0.332	7.677	5.551	2.126	5.433	0.394
MDW3438XHV12	●	11/32"	0.344	7.677	5.551	2.126	5.433	0.394
MDW3594XHV12	●	23/64"	0.359	7.677	5.551	2.126	5.433	0.394
MDW3750XHV12	●	3/8"	0.375	7.677	5.551	2.126	5.433	0.394
MDW3906XHV12	●	25/64"	0.391	7.677	5.551	2.126	5.433	0.394
MDW4063XHV12	●	13/32"	0.406	8.543	6.339	2.205	6.220	0.472
MDW4219XHV12	●	27/64"	0.422	8.543	6.339	2.205	6.220	0.472
MDW4375XHV12	●	7/16"	0.438	8.543	6.339	2.205	6.220	0.472
MDW4531XHV12	●	29/64"	0.453	8.543	6.339	2.205	6.220	0.472
MDW4688XHV12	●	15/32"	0.469	8.543	6.339	2.205	6.220	0.472
MDW4844XHV12	●	31/64"	0.484	9.566	7.283	2.283	7.165	0.551
MDW5000XHV12	●	1/2"	0.500	9.566	7.283	2.283	7.165	0.551
MDW5312XHV12	●	17/32"	0.531	9.566	7.283	2.283	7.165	0.551
MDW5625XHV12	●	9/16"	0.563	10.669	8.307	2.362	8.189	0.630
MDW6250XHV12	●	5/8"	0.625	10.669	8.307	2.362	8.189	0.630
MDW7500XHV12	●	3/4"	0.750	12.709	10.268	2.441	10.157	0.787

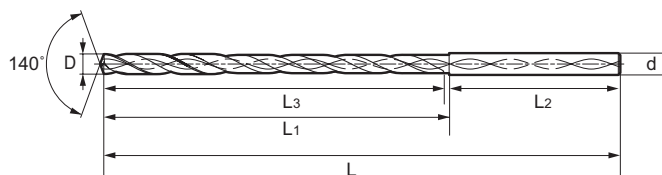
● = USA Stocked item

NOTE: MDS-V is the stocked recommended guide drill for the XHV series. Use a guide hole drill with diameter the same as that of the MDW-XHV type.





Tolerance of Diameters	
ϕD	Tolerance
$.1181 < \phi D \leq .2362$	-.00080 -.00145
$.2362 < \phi D \leq .3937$	-.00080 -.00165
$.3937 < \phi D \leq .7087$	-.00080 -.00185



12XD-METRIC

Catalog Number	Stock	D	L	L1	L2	L3	d
MDW030XHV12	●	3.0	96	48	48	45	4
MDW035XHV12	●	3.5	105	57	48	54	4
MDW040XHV12	●	4.0	111	63	48	60	4
MDW045XHV12	●	4.5	117	67	50	64	6
MDW050XHV12	●	5.0	131	81	50	78	6
MDW051XHV12	●	5.1	131	81	50	78	6
MDW055XHV12	●	5.5	138	88	50	85	6
MDW060XHV12	●	6.0	138	88	50	85	6
MDW065XHV12	●	6.5	155	103	52	100	8
MDW069XHV12	●	6.9	165	113	52	110	8
MDW070XHV12	●	7.0	165	113	52	110	8
MDW075XHV12	●	7.5	165	113	52	110	8
MDW080XHV12	●	8.0	165	113	52	110	8
MDW085XHV12	●	8.5	195	141	54	138	10
MDW090XHV12	●	9.0	195	141	54	138	10
MDW093XHV12	●	9.3	195	141	54	138	10
MDW095XHV12	●	9.5	195	141	54	138	10
MDW100XHV12	●	10.0	195	141	54	138	10
MDW105XHV12	●	10.5	217	161	56	158	12
MDW110XHV12	●	11.0	217	161	56	158	12
MDW115XHV12	●	11.5	217	161	56	158	12
MDW120XHV12	●	12.0	217	161	56	158	12
MDW125XHV12	●	12.5	243	185	58	182	14
MDW130XHV12	●	13.0	243	185	58	182	14
MDW140XHV12	●	14.0	243	185	58	182	14

● = USA Stocked item

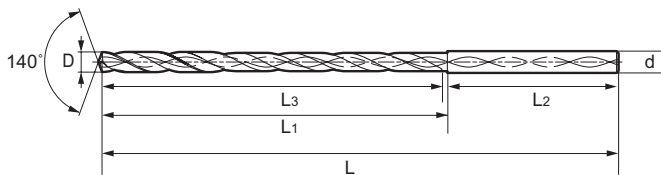


**MDW-XHV Deep Hole
Carbide Coolant Through Drills**

**20XD-INCH
MDW-XHV**



Tolerance of Diameters	
ϕD	Tolerance
$.1181 < \phi D \leq .2362$	-.00080 -.00145
$.2362 < \phi D \leq .3937$	-.00080 -.00165
$.3937 < \phi D \leq .7087$	-.00080 -.00185



20XD-INCH

Catalog Number	Stock	Cutting Dia.		L	L1	L2	L3	d
		Fraction	Decimal					
MDW1250XHV20	●	1/8"	0.125	4.842	2.952	1.890	2.834	0.157
MDW1406XHV20	●	9/64"	0.141	5.472	3.582	1.890	3.464	0.157
MDW1563XHV20	●	5/32"	0.156	5.472	3.582	1.890	3.464	0.157
MDW1719XHV20	●	11/64"	0.172	6.418	4.449	1.969	4.331	0.236
MDW1875XHV20	●	3/16"	0.188	6.614	4.645	1.969	4.527	0.236
MDW2031XHV20	●	13/64"	0.203	6.614	4.645	1.969	4.527	0.236
MDW2130XHV20	●	#3	0.213	7.520	5.551	1.969	5.433	0.236
MDW2187XHV20	●	7/32"	0.219	7.520	5.551	1.969	5.433	0.236
MDW2500XHV20	●	1/4"	0.250	7.913	5.866	2.047	5.748	0.315
MDW2570XHV20	●	#F	0.257	7.913	5.866	2.047	5.748	0.315
MDW2656XHV20	●	17/64"	0.266	7.913	5.866	2.047	5.748	0.315
MDW2813XHV20	●	9/32"	0.281	9.094	7.047	2.047	6.929	0.315
MDW2969XHV20	●	19/64"	0.297	9.094	7.047	2.047	6.929	0.315
MDW3125XHV20	●	5/16"	0.313	9.094	7.047	2.047	6.929	0.315
MDW3320XHV20	●	#Q	0.332	10.905	8.779	2.126	8.661	0.394
MDW3438XHV20	●	11/32"	0.344	10.905	8.779	2.126	8.661	0.394
MDW3594XHV20	●	23/64"	0.359	10.905	8.779	2.126	8.661	0.394
MDW3750XHV20	●	3/8"	0.375	10.905	8.779	2.126	8.661	0.394
MDW3906XHV20	●	25/64"	0.391	10.905	8.779	2.126	8.661	0.394
MDW4063XHV20	●	13/32"	0.406	12.713	10.508	2.205	10.394	0.472
MDW4219XHV20	●	27/64"	0.422	12.713	10.508	2.205	10.394	0.472
MDW4375XHV20	●	7/16"	0.438	12.713	10.508	2.205	10.394	0.472
MDW4531XHV20	●	29/64"	0.453	12.713	10.508	2.205	10.394	0.472
MDW4688XHV20	●	15/32"	0.469	12.713	10.508	2.205	10.394	0.472
MDW4844XHV20	●	31/64"	0.484	14.521	12.238	2.283	12.126	0.551
MDW5000XHV20	●	1/2"	0.500	14.521	12.238	2.283	12.126	0.551
MDW5312XHV20	●	17/32"	0.531	14.521	12.238	2.283	12.126	0.551

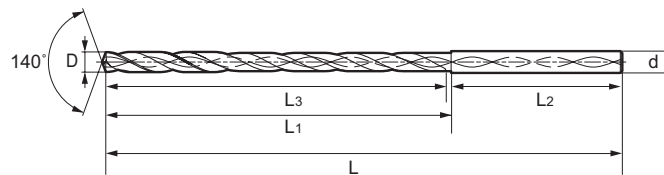
● = USA Stocked item

NOTE: MDS-V is the stocked recommended guide drill for the XHV series. Use a guide hole drill with diameter the same as that of the MDW-XHV type.





Tolerance of Diameters	
øD	Tolerance
.1181 < øD ≤ .2362	-.00080 -.00145
.2362 < øD ≤ .3937	-.00080 -.00165
.3937 < øD ≤ .7087	-.00080 -.00185



20XD-METRIC

Catalog Number	Stock	D	L	L1	L2	L3	d
MDW030XHV20	●	3.0	123.0	75	48	72.0	4
MDW035XHV20	●	3.5	139.0	91	48	88.0	4
MDW040XHV20	●	4.0	139.0	91	48	88.0	4
MDW045XHV20	●	4.5	163.0	113	50	110.0	6
MDW050XHV20	●	5.0	168.0	118	50	115.0	6
MDW051XHV20	●	5.1	168.0	118	50	115.0	6
MDW055XHV20	●	5.5	191.0	141	50	138.0	6
MDW060XHV20	●	6.0	191.0	141	50	138.0	6
MDW065XHV20	●	6.5	201.0	149	52	146.0	8
MDW069XHV20	●	6.9	231.0	179	52	176.0	8
MDW070XHV20	●	7.0	231.0	179	52	176.0	8
MDW075XHV20	●	7.5	231.0	179	52	176.0	8
MDW080XHV20	●	8.0	231.0	179	52	176.0	8
MDW085XHV20	●	8.5	277.0	223	54	220.0	10
MDW090XHV20	●	9.0	277.0	223	54	220.0	10
MDW093XHV20	●	9.3	277.0	223	54	220.0	10
MDW095XHV20	●	9.5	277.0	223	54	220.0	10
MDW100XHV20	●	10.0	277.0	223	54	220.0	10
MDW105XHV20	●	10.5	322.9	267	56	264.0	12
MDW110XHV20	●	11.0	322.9	267	56	264.0	12
MDW115XHV20	●	11.5	322.9	267	56	264.0	12
MDW120XHV20	●	12.0	322.9	267	56	264.0	12
MDW125XHV20	●	12.5	368.8	311	58	308.0	14
MDW130XHV20	●	13.0	368.8	311	58	308.0	14
MDW140XHV20	●	14.0	368.8	311	58	308.0	14

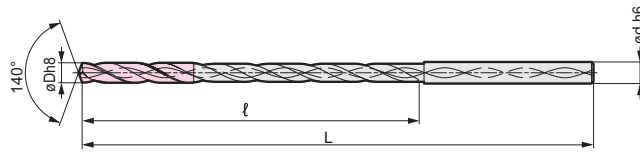
● = USA Stocked item

NOTE: MDS-V is the stocked recommended guide drill for the XHV series. Use a guide hole drill with diameter the same as that of the MDW-XHV type.



**MDW-XHT Deep Hole
Carbide Coolant Through Drills**

**15, 25 & 30XD-METRIC
MDW-XHT/PHT**

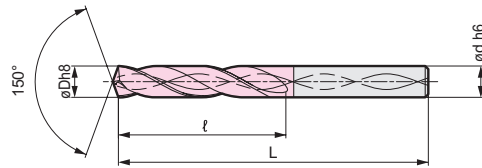


MDW-XHT-METRIC

Tool Dia. øD _c (mm)	Shank Dia. øD _s (mm)	Catalog Number	15XD			25XD			30XD		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)	
				L	ℓ		L	ℓ		L	ℓ
2.97	3.0	MDW0297XHT□□	★	108	60	★	138	90	★	153	105
3.47	4.0	MDW0347XHT□□	★	118	70	★	153	105	★	171	123
3.97	4.0	MDW0397XHT□□	★	128	80	★	168	120	★	188	140
4.47	5.0	MDW0447XHT□□	★	140	90	★	185	135	★	208	158
4.97	5.0	MDW0497XHT□□	★	150	100	★	200	150	★	225	175
5.47	6.0	MDW0547XHT□□	★	162	110	★	217	165	★	245	193
5.97	6.0	MDW0597XHT□□	★	172	120	★	232	180	★	262	210
6.47	7.0	MDW0647XHT□□	★	183	130	★	248	195	★	281	228
6.97	7.0	MDW0697XHT□□	★	193	140	★	263	210	★	298	245
7.47	8.0	MDW0747XHT□□	★	204	150	★	279	225	★	317	263
7.97	8.0	MDW0797XHT□□	★	214	160	★	294	240	★	334	280

★ = Worldwide Warehouse item available in 10 business days

NOTE: MDW-PHT is the recommended guide drill for the XHT series. Use a guide hole drill with a diameter +0.001 to +0.002 inch larger than that of the MDW-XHT type.



MDW-PHT-METRIC

Tool Dia. øD _c (mm)	Shank Dia. øD _s (mm)	Catalog Number	Guide Hole Drill		
			Stock	Dimensions (mm)	
				L	ℓ
3.0	3.0	MDW0300PHT□□	★	68	17.5
3.5	4.0	MDW0350PHT□□	★	72	20.0
4.0	4.0	MDW0400PHT□□	★	72	22.5
4.5	5.0	MDW0450PHT□□	★	80	25.0
5.0	5.0	MDW0500PHT□□	★	80	27.5
5.5	6.0	MDW0550PHT□□	★	82	27.5
6.0	6.0	MDW0600PHT□□	★	82	30.0
6.5	7.0	MDW0650PHT□□	★	88	32.5
7.0	7.0	MDW0700PHT□□	★	88	35.0
7.5	8.0	MDW0750PHT□□	★	94	37.5
8.0	8.0	MDW0800PHT□□	★	94	40.0

★ = Worldwide Warehouse item available in 10 business days



TECHNICAL INFORMATION & HARDWARE

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Technical
Information

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Sumitomo Electric has developed TME (external) and TMI (internal) threading inserts with a pitch range of 1.0 ~ 3.0 mm and 8~24 threads per inch (TPI) along with applicable LTE type and STI holders. The superior features of the TME and TMI threading inserts include an M-class tolerance and dimple shaped chipbreaker. The M-class tolerance reduces insert cost by eliminating the need for expensive grinding. Furthermore, chip control is greatly improved as a result of the specially designed dimple chipbreakers.

FEATURES

- A positive rake angle encourages good chip control and reduces cutting resistance.
- Two tier dimple-style chip breakers evacuate chips smoothly and easily.
- M-class tolerance reduces insert cost.
- Four available grades cover a wider range of applications.

INSERT GRADES & RECOMMENDED RUNNING CONDITIONS

Application

AC225 (Coated)

- For stainless and general steels
- Stable machining

T130A (Cermet)

- For soft and general steels
- Good surface finish
- Long tool life

A30 (P30 Carbide)

- For low and medium speed cutting of stainless and general steels

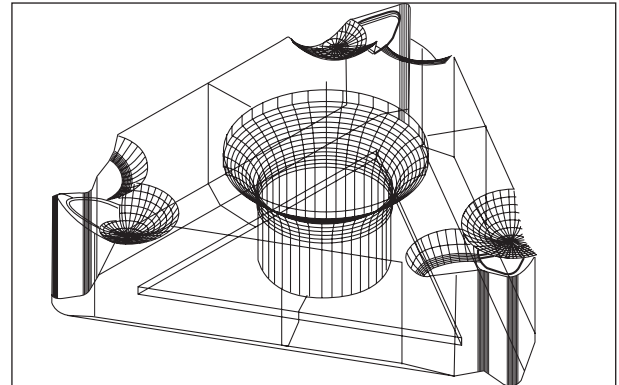
EH20Z (PVD Coated)

- For exotic materials

Recommended Running Conditions (SFM)

Work Material \ Insert Grade	AC225	T130A	A30	EH20Z
Soft Steel	500 ~ 660	330 ~ 500	230 ~ 400	—
Carbon Steel	330 ~ 550	260 ~ 430	230 ~ 330	—
Alloy Steel	300 ~ 500	260 ~ 400	230 ~ 330	—
Stainless Steel	230 ~ 450	—	230 ~ 330	—
Exotics	—	—	—	100 ~ 150

TME Insert Design



Trouble Shooting

- **Chipping**
T130A → AC225
- **Excessive Wear**
A30 → AC225 → T130A
- **Plastic Deformation**
A30 → AC225 → T130A

Recommended Infeed Values mm (inch)

Pitch (mm) \ TPI	1.0	1.25	1.5	1.75	2	2.5	3
	24	19	16	14	12	9	8
1 ST	0.25 (.010)	0.25 (.010)	0.30 (.012)	0.30 (.012)	0.30 (.012)	0.35 (.014)	0.35 (.014)
2 ND	0.20 (.008)	0.20 (.008)	0.25 (.010)	0.25 (.010)	0.25 (.010)	0.30 (.012)	0.30 (.012)
3 RD	0.15 (.006)	0.15 (.006)	0.20 (.008)	0.20 (.008)	0.20 (.008)	0.25 (.010)	0.25 (.010)
4 TH	0.10 (.004)	0.15 (.006)	0.15 (.006)	0.15 (.006)	0.20 (.008)	0.20 (.008)	0.20 (.008)
5 TH	0.05 (.002)	0.10 (.004)	0.10 (.004)	0.15 (.006)	0.15 (.006)	0.20 (.008)	0.20 (.008)
6 TH	—	0.05 (.002)	0.05 (.002)	0.10 (.004)	0.12 (.005)	0.15 (.006)	0.15 (.006)
7 TH	—	—	—	0.05 (.002)	0.10 (.004)	0.15 (.006)	0.15 (.006)
8 TH	—	—	—	—	0.05 (.002)	0.10 (.004)	0.15 (.006)
9 TH	—	—	—	—	—	0.05 (.002)	0.10 (.004)
10 TH	—	—	—	—	—	—	0.10 (.004)
11 TH	—	—	—	—	—	—	0.05 (.002)



THREADING SYSTEM

TERMS:

Thread Form – (most common shapes)

60° (UN standard, ISO) 55° (British standard) 29° (Acme standard/stub)

Pitch – Distance from the top of one thread to the next.

Pitch = 1 (inch) / threads per inch, Ex: 20 TPI = 1 / 20 = .050

T.P.I. – Number of threads per inch

TPI = 1 (inch) / pitch, Ex: 1 / .050 (pitch) = 20 tpi

Lead – Movement caused by one revolution of the screw.

(the same as pitch in a single start thread)

Lead = pitch x number of starts

Example: double start thread with .050 pitch = .100 lead

Multi-Start Thread – Thread with more than one starting position. (lead different than pitch)

Helix angle – Angle generated by the helix of the thread at the pitch diameter.

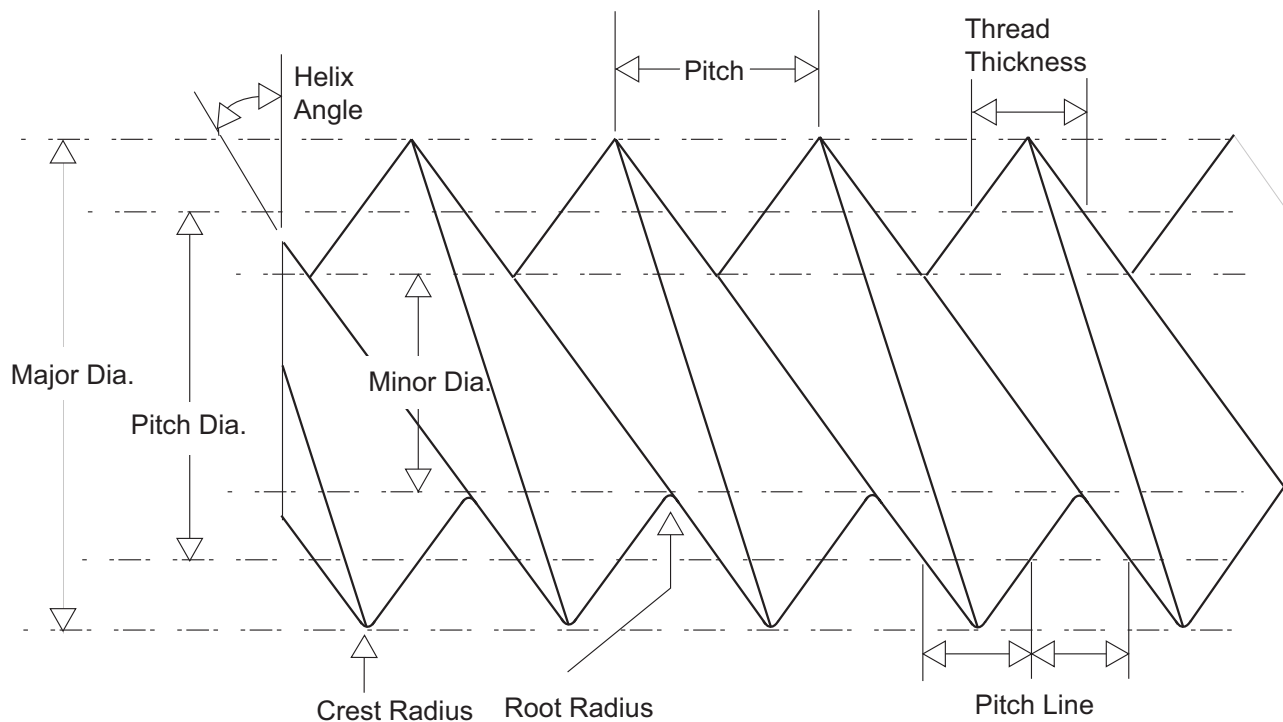
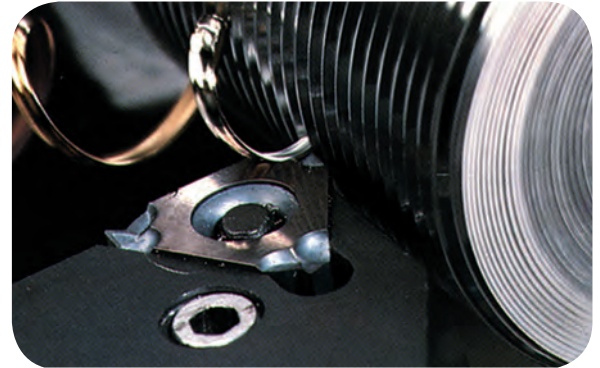
Major Diameter – see drawing below

Minor Diameter – see drawing below

Pitch Diameter – see drawing below

Pitch Line – see drawing below

Crest and Root Radius – see drawing below



RECOMMENDED RUNNING CONDITIONS (SFM)

Material	Application	Hardness	Grade	Low	Low Opt.	High Opt.	High
INDUCTION HARDENED STEEL	Continuous	45-65HrC	BN1000	400	550	650	700
			BNX10	400	500	650	700
			BNC160	400	550	650	800
			BNX20	300	450	550	600
			BNC200	350	500	650	750
			BNC100	400	600	700	1000
	Interrupted (DRY)	45-65 HrC	BN2000	300	400	550	600
			BNX25	400	550	700	750
			BN2000	300	400	550	600
			BN350	300	400	550	600
			BNC300	300	400	550	600
			BNC200	350	400	500	600

Material	Application	Hardness	Grade	Low	Low Opt.	High Opt.	High
CARBURIZED HARDENED STEEL BEARING STEEL	Continuous	45-65 HrC	BNC160	350	450	550	600
			BNX20	250	300	500	600
			BNC200	300	350	550	650
			BNC100	350	425	550	675
			BN2000	300	400	550	600
			BNX25	400	550	700	750
	Interrupted (DRY)	45-65 HrC	BN300	300	400	550	600
			BN350	300	400	550	600
			BNC200	300	400	550	650
			BNC300	300	400	550	600
			BNC300	300	400	550	600
			BNC300	300	400	550	600

Material	Application	Hardness	Grade	Low	Low Opt.	High Opt.	High
DIE STEEL HIGH SPEED STEEL	Continuous	55-65 HrC	BN2000	150	250	450	550
			BN1000	250	300	450	650
			BNX10	250	300	400	500
			BNC160	250	300	400	500
			BNX20	150	200	300	450
			BNC200	200	250	350	450
			BNC100	250	300	400	500
	Interrupted (DRY)	55-65 HrC	BN2000	150	200	250	300
			BNX25	300	400	500	550
			BN300	150	200	250	300
			BN350	150	200	250	300
			BN350	150	200	250	300
			BNC300	200	250	300	350
			BNC300	200	250	300	350

FEED RATE

FEED RATE (IPR)		
Finishing	General Purpose	Roughing
0.002 - 0.004	0.004 - 0.006	0.006 - 0.008

Note: Use above speeds for threading and grooving applications. The recommended feed rate for grooving is 0.001 - 0.002 IPR, while your threading feed rate should be based upon the thread form, but not to exceed 0.006 IPR.

Grade	General Running Parameters* (SFM)			
	Low	Low Opt.	High Opt.	High
BNX10	400	450	650	700
BNC160	400	450	650	720
BNX20	250	400	600	650
BNC200	200	350	650	820
BN250	200	250	400	500
BNX25	450	500	650	700
BN300	200	300	500	550
BN350	200	300	500	550
BNC100	400	525	675	850
BNC300	200	250	400	500

* The above are a general range of running parameters based on grade and material. Please contact your local Sumitomo Sales Representative or the Sumitomo Engineering Department to obtain more application specific running parameters.

Note: Running wiper inserts at the above feed rates will produce a higher quality surface finish when compared to a non-wiper insert.

DEPTH OF CUT

Mini-Tip (NU, NS, NC)	D.O.C. ≤ 0.015"
Medium-Tip (MD)	D.O.C. ≤ 0.020"
Full-Tip	D.O.C. ≤ 0.020"

Note: Depth of cut per pass



■ RECOMMENDED RUNNING CONDITIONS (SFM)

Material	Application	Grade	Low	Low Opt.	High Opt.	High
GRAY CAST IRON	Continuous & Interrupted	BN7000	2600	3000	5000	6500
		BN700	2300	3000	5000	6000
		BNS800	1000	2000	5500	6500
		BNC500	600	1000	2000	2500
		BN500	1500	2000	5500	6000

Material	Application	Grade	Low	Low Opt.	High Opt.	High
DUCTILE IRON 150 -300 HBn	Continuous & Interrupted	BNC500	650	800	1300	1650
		BN7000	300	450	550	650
		BN700	300	450	550	600

Material	Application	Grade	Low	Low Opt.	High Opt.	High
GENERAL SINTERED ALLOY	Continuous & Interrupted	BN700	400	550	800	1000
		BN7000	400	550	800	1000
		BN7500	400	550	650	1000

Material	Application	Grade	Low	Low Opt.	High Opt.	High
HIGH DENSITY SINTERED ALLOY	Continuous & Interrupted	BN7500	65	450	550	750
		BN7000	65	450	550	750
		BN700	65	450	550	750
		BNS800	65	450	550	750

■ FEED RATE

FEED RATE (IPR)		
Finishing	General Purpose	Roughing
0.002 - 0.004	0.004 - 0.006	0.006 - 0.008

Note: Use above speeds for threading and grooving applications.
The recommended feed rate for grooving is 0.001 - 0.002 IPR, while your threading feed rate should be based upon the thread form, but not to exceed 0.006 IPR.

Grade	General Running Parameters* (SFM)			
	Low	Low Opt.	High Opt.	High
BN500	500	800	1500	2000
BNS800	2000	3000	5000	6000
BN700	2000	3000	5000	6000

* The above are a general range of running parameters based on grade and material. Please contact your local Sumitomo Sales Representative or the Sumitomo Engineering Department to obtain more application specific running parameters.
Coolant should not be used for any interrupted cutting when using PCBN tools

■ DEPTH OF CUT

Mini-Tip (NU, NS, NC)	D.O.C. ≤ 0.020"
Medium-Tip (MD)	D.O.C. ≤ 0.040"
Full-Tip	D.O.C. ≤ 0.040"
Solid CBN**	D.O.C. ≤ 0.150"

**Depth of cut based on gray cast iron material. For chilled iron, depth of cut should not exceed 0.080".



PCD APPLICATIONS

RECOMMENDED RUNNING CONDITIONS

Material	SFM	IPR	D.O.C	Grade Recommendation		
				First	Second	Third
Aluminum Alloys (4% - 8% Si)	3,000 - 10,000	0.004 - 0.025	0.120"	DA1000	DA2200	DA150
Aluminum Alloys (9% - 14% Si)	2,000 - 8,000	0.004 - 0.020	0.120"	DA1000	DA2200	DA150
Aluminum Alloys (15% - 18% Si)	1,000 - 2,300	0.004 - 0.015	0.120"	DA1000	DA2200	DA150
Copper Alloy	3,300	0.002 - 0.008	0.120"	DA1000	DA2200	DA150
Hard Plastic	3,300	0.004 - 0.012	0.080"	DA1000	DA2200	DA150
Wood & Composite	13,000	0.004 - 0.015	-	DA1000	DA2200	DA150
Tungsten Carbide	30 - 70	0.003 - 0.008	0.020"	DA90	DA150	-
Reinforced Plastics	3,300	0.016	0.080"	DA1000	DA2200	DA150

Note: The above running parameters are for turning applications only.

Technical Information



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters			
			Finishing .002 ~ .008 IPR. 005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .020 IPR .040" ~ .200" D.O.C.	Roughing .008 ~ .020 IPR .040" ~ .200" D.O.C.	
LOW CARBON STEELS 1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1108, 1109, 1110, 1115, 1116, 1117, 1118, 1119, 1211, 1212, 1213, 1215, 1513, 1518, 1522	<250	T1500A	800~1650	800~1450	-	
		T1500Z	800~1750	800~1550	-	
		AC805P	800~1750	800~1550	700~1200	
		AC810P	800~1600	800~1400	700~1100	
		AC820P	500~1200	500~1000	400~900	
		AC830P	-	500~900	400~850	
	220~350	T1500A	700~1300	700~1200	-	
		T1500Z	700~1450	700~1300	-	
		AC805P	700~1300	700~1200	600~1100	
		AC810P	700~1200	700~1100	600~950	
		AC820P	500~1000	500~900	400~800	
		AC830P	-	500~800	400~750	
	HRc 35~55	T1500A	400~750	400~650	-	
		T1500Z	400~800	400~750	-	
		AC805P	400~750	400~650	350~600	
		AC810P	400~600	400~550	350~550	
		AC820P	300~500	300~450	300~450	
		AC830P	250~450	200~400	200~400	
	LOW/MEDIUM CARBON STEEL -- LEADED 10L18, 10L45, 10L50, 11L17, 11L37, 11L41, 11L44, 12L13, 12L14, 12L15	<250	T1500A	1000~1650	1000~1550	-
			T1500Z	1000~1750	1000~1650	-
			AC805P	1000~1650	1000~1550	900~1450
AC810P			1000~1500	1000~1400	900~1300	
AC820P			800~1400	750~1300	600~1100	
AC830P			-	750~1200	650~1000	
250~ 350		T1500A	900~1350	800~1200	-	
		T1500Z	900~1450	800~1300	-	
		AC805P	900~1350	800~1200	700~1100	
		AC810P	900~1200	800~1100	700~1000	
		AC820P	800~1000	700~900	650~900	
		AC830P	-	700~900	650~900	
Chipbreaker Preference		ESE/ESU/ELU	EGE/ELU	EME/EMU		

Technical Information



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters			
			Finishing .002 ~ .012 IPR .005" ~ .060" D.O.C.	Gen. Purpose .010 ~ .020 IPR .040" ~ .200" D.O.C.	Roughing .015 ~ .026 IPR 200" D.O.C.	
			CUTTING SPEED SFM			
MEDIUM CARBON STEELS 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1132, 1137, 1139, 1140, 1141, 1144, 1145, 1146, 1151, 1524, 1525, 1526, 1527, 1536, 1541, 1547, 1548, 1551, 1552	<250	T1500A	900~1450	900~1300	-	
		T1500Z	900~1550	900~1450	-	
		AC805P	900~1450	900~1300	800~1100	
		AC810P	900~1300	900~1200	800~1000	
		AC820P	800~1000	500~900	450~800	
		AC830P	-	500~800	400~700	
	220~350	T1500A	800~1300	700~1200	-	
		T1500Z	800~1450	700~1300	-	
		AC805P	800~1300	700~1200	600~1100	
		AC810P	800~1200	700~1100	600~1000	
		AC820P	600~1000	500~900	450~950	
		AC830P	-	500~850	400~800	
	HRc 35~55	T1500A	600~1000	400~900	-	
		T1500Z	600~1100	400~1000	-	
		AC805P	500~1000	400~800	350~800	
		AC810P	500~900	400~750	350~700	
		AC820P	400~750	350~700	300~550	
		AC830P	-	350~600	300~500	
		NB90S	400~1400	-	-	
	MEDIUM HIGH CARBON STEELS --LEADED 41L30, 41L40, 41L45, 41L47, 41L50, 43L40, 41L50, 43640, 51L32, 52L100, 86L20, 86L40	<250	T1500A	800~1550	800~1450	-
			T1500Z	800~1650	800~1550	-
AC805P			800~1550	800~1450	700~1200	
AC810P			800~1400	800~1300	700~1100	
AC820P			800~1200	700~1000	600~900	
AC830P			-	650~950	550~800	
250~ 350		T1500A	800~1450	750~1300	-	
		T1500Z	800~1550	750~1450	-	
		AC805P	800~1450	750~1300	650~1100	
		AC810P	800~1300	750~1200	650~1000	
		AC820P	700~1100	650~1000	550~900	
		AC830P	-	600~1000	500~800	
Chipbreaker Preference		ESE/ESU/ELU	EGE/ELU	EME/EMU		

Technical Guidance



Recommended first choice,

Recommended second choice,

Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .012 IPR .005" ~ .060" D.O.C.	Gen. Purpose .010 ~ .020 IPR .040" ~ .200" D.O.C.	Roughing .015 ~ .026 IPR 200" D.O.C.
			CUTTING SPEED SFM		
ALLOY STEELS— MEDIUM CARBON 1340, 1345, 4042, 4047, 4140, 4142, 4145, 4147, 4340, 50B40, 40B44, 5046, 50B46, 5140, 5145, 5147, 81B45, 8640, 8642, 8645, 86B45, 8740, 8742, 4150, 4161, 50B50, 4060, 50B60, 5150, 5155, 5160, 51B60, 6150, 8650, 8655, 8660, 9254, 9255, 9260	250~350	T1500A	700~1200	700~1100	—
		T1500Z	700~1300	700~1200	—
		AC805P	700~1200	700~1100	500~900
		AC810P	700~1100	700~1000	500~800
		AC820P	600~950	500~850	450~800
		AC830P	—	500~800	400~700
	<250	T1500A	600~1100	600~1000	—
		T1500Z	600~1200	600~1100	—
		AC805P	600~1100	600~1000	—
		AC810P	600~1000	600~900	—
		AC820P	500~900	450~800	400~750
		AC830P	—	400~750	300~700
	250~350	T1500A	300~650	300~550	—
		T1500Z	300~800	300~650	—
		AC805P	300~650	300~550	200~550
		AC810P	300~600	300~500	200~500
		AC820P	250~500	200~450	150~400
		AC830P	250~400	200~400	150~400
NB90S		500~900	—	—	
HIGH CARBON STEELS 50100, 51100 52100, M-50	<250	T1500A	800~1300	700~1200	—
		T1500Z	800~1450	700~1300	—
		AC805P	800~1400	700~1300	600~1100
		AC810P	800~1250	700~1150	600~1000
		AC820P	450~850	300~750	300~700
		AC830P	—	300~750	300~650
	250~350	T1500A	700~1200	600~1100	—
		T1500Z	700~1300	600~1200	—
		AC805P	700~1300	600~1200	500~900
		AC810P	700~1150	600~1100	500~800
		AC820P	550~850	500~750	400~650
		AC830P	—	450~700	400~600
	Chipbreaker Preference	ESE/ESU/ELU	EGE/ELU	EME/EMU	



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters			
			Finishing .002 ~ .012 IPR .005" ~ .060" D.O.C.	Gen. Purpose .010 ~ .020 IPR .040" ~ .200" D.O.C.	Roughing .015 ~ .026 IPR 200" D.O.C.	
CUTTING SPEED SFM						
TOOL STEELS DIE STEELS	<250	T1500A	500~800	350~800	-	
		T1500Z	500~950	350~900	-	
		AC805P	500~1000	350~900	300~850	
		AC810P	500~900	350~800	300~750	
		AC820P	400~700	350~650	300~600	
		AC830P	-	350~650	300~600	
	250~350	T1500A	650~1000	450~950	-	
		T1500Z	500~900	350~900	-	
		AC805P	500~1000	450~900	350~850	
		AC810P	500~900	450~800	350~750	
		AC820P	400~750	400~650	300~600	
		AC830P	-	300~650	200~600	
	HRc 36-50	T1500A	350~550	300~550	-	
		T1500Z	300~600	200~550	-	
		AC805P	300~650	200~550	200~550	
		AC810P	300~600	200~500	200~500	
		AC820P	200~400	200~350	150~300	
		AC830P	200~400	200~350	150~300	
		NB90S	300~600	-	-	
	HIGH STRENGTH STEELS 300M, 4340, 4340M 4340V, H13, H11 50100, 51100 52100, M-50	250~300	T1500A	600~1000	450~900	-
			T1500Z	550~1050	450~950	-
AC805P			500~1050	350~950	300~800	
AC810P			500~950	350~850	300~700	
AC820P			400~700	350~700	300~650	
AC830P			-	350~700	300~600	
HRc 35-45		T1500A	550~900	350~850	-	
		T1500Z	500~1000	350~950	-	
		AC805P	500~1000	350~950	300~900	
		AC810P	500~900	350~850	300~800	
		AC820P	400~800	300~700	250~650	
AC830P		-	300~650	250~600		
Chipbreaker Preference		ESE/ESU/ELU	EGE/ELU	EME/EMU		



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .012 IPR .005" ~ .060" D.O.C.	Gen. Purpose .010 ~ .020 IPR .040" ~ .200" D.O.C.	Roughing .015 ~ .026 IPR 200" D.O.C.
			CUTTING SPEED SFM		
STAINLESS STEEL 300 SERIES AUSTENITIC	160~280	T1500A	350~850	300~650	-
		T1500Z	300~900	300~800	-
		AC510U	400~700	400~650	-
		AC520U	300~550	300~550	300~550
		AC530U	300~500	250~500	250~500
		EH510	300~500	300~500	-
		EH520	-	300~500	300~500
		AC810P	450~750	400~700	-
		AC820P	-	300~600	300~550
		AC830P	-	250~600	200~550
		AC610M	600~800	500~700	400~600
		AC630M	400~650	300~550	300~500
STAINLESS STEEL 400 SERIES MARTENSITIC	160~260	T1500A	300~850	300~750	-
		T1500Z	300~950	300~850	-
		AC510U	500~850	450~750	-
		AC520U	400~700	400~600	300~600
		AC530U	300~600	300~550	300~550
		EH510	300~600	300~550	-
		EH520	300~600	300~550	300~500
		AC810P	-	400~700	-
		AC820P	450~650	300~600	300~550
		AC830P	-	250~600	200~550
		AC610M	500~700	500~650	500~600
		AC630M	300~650	300~600	300~550
	Chipbreaker Preference	EEF/ESU	EEG/EEX/EUP	EEG/EMU	



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.
CUTTING SPEED SFM					
STAINLESS STEEL 400 SERIES MARTENSITIC cont.	260~380	T1500A	200~600	200~550	-
		T1500Z	200~700	200~650	-
		AC510U	400~700	400~650	-
		AC520U	300~600	300~600	300~550
		AC530U	300~550	300~500	300~500
		EH510	300~600	300~600	-
		EH520	-	300~550	250~500
		AC810P	350~800	250~750	-
		AC820P	-	200~600	200~600
		AC830P	-	200~600	200~600
		AC610M	500~700	500~650	500~600
		AC630M	300~650	300~600	300~550
	HrC 36~46	T1500A	200~600	200~500	-
		T1500Z	200~700	200~650	-
		AC510U	300~650	250~600	-
		AC520U	300~600	250~550	250~550
		AC530U	250~550	250~500	250~500
		EH510	200~500	200~450	-
		EH520	-	200~450	200~400
		AC810P	200~750	200~700	-
		AC820P	-	200~550	200~500
		AC830P	-	200~550	200~500
		AC610M	400~700	400~650	400~600
		AC630M	200~650	200~600	200~550
	Chipbreaker Preference		EEF/ESU	EEG/EEX/EUP	EEG/EMU



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.
			CUTTING SPEED SFM		
STAINLESS STEEL PRECIPITATION HARDENING 15-5PH, 16-6PH, 17-4, 17-7PH, 13-8Mo	160~260	T1500A	300~800	250~700	-
		T1500Z	300~900	250~750	-
		AC510U	400~900	350~850	-
		AC520U	400~800	400~750	400~700
		AC530U	300~600	300~550	300~500
		EH510	350~700	325~600	-
		EH520	-	300~650	250~550
		AC810P	400~900	400~800	-
		AC820P	300~750	300~650	300~600
		AC830P	-	300~650	300~600
		AC610M	400~700	400~650	400~600
		AC630M	200~650	200~600	200~550
	25~36	T1500A	200~700	200~600	-
		T1500Z	300~800	300~750	-
		AC510U	300~850	300~750	-
		AC520U	300~750	300~700	300~600
		AC530U	250~600	250~550	250~500
		EH510	250~450	250~400	-
		EH520	-	250~450	250~425
		AC810P	300~800	250~750	-
		AC820P	300~600	200~600	200~550
		AC830P	-	200~600	200~500
		AC610M	500~700	500~650	500~600
		AC630M	300~650	300~600	300~550
	36~46	T1500A	300~650	300~600	-
		T1500Z	300~700	300~650	-
		AC510U	300~650	300~650	-
		AC520U	300~650	300~625	250~600
		AC530U	250~550	250~500	250~500
		AC810P	200~750	200~650	-
		AC820P	200~550	200~525	200~500
		AC830P	-	200~500	200~450
		AC610M	400~700	400~650	400~600
		AC630M	300~650	300~600	300~550
	Chipbreaker Preference		EEF/ESU	EEG/EEX/EUP	EEG/EMU



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters				
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.		
			CUTTING SPEED SFM				
STAINLESS STEEL WROUGHT AUSTENITIC	160~260	T1500A	200~600	200~550	-		
		T1500Z	200~700	200~650	-		
		EH510/520	250~600	200~500	150~400		
		AC510U	200~750	200~750	300~700		
		AC520U	200~750	200~700	200~700		
		AC530U	200~600	200~550	200~500		
		AC810P	300~850	250~750	250~750		
		AC820P	300~600	200~600	200~600		
NITRONIC 32 NITRONIC 33 NITRONIC 40 NITRONIC 50 NITRONIC 60	160~260	AC830P	300~700	200~600	300~600		
		EH510/520	50~150	30~130	30~100		
		AC510U	100~240	100~200	60~180		
		AC520U	100~200	80~180	50~150		
		HIGH TEMP. ALLOYS Nickel Base, Wrought Haynes Alloy 263, Incoloy Alloy 901, 903 Inconel Alloy 617, 625, 702, 706, 718, 721, 722, X-750, 751, M252 Nimonic 75, 80 Waspaloy	25~36	AC530U	80~180	80~150	50~120
				WX2000	400~1500	400~1200	400~1000
				EH510/520	40~130	30~110	30~90
				AC510U	90~200	80~180	80~150
				AC520U	90~180	70~150	50~120
				AC530U	80~160	70~140	50~120
WX2000	400~1500			400~1200	400~1000		
Nickel Base, Wrought Hastelloy Alloy	25~36			EH510/520	100~190	80~150	70~130
		AC510U	120~230	90~190	80~170		
		AC520U	120~230	90~190	80~170		
		AC530U	80~180	80~150	50~150		
		WX2000	400~1500	400~1200	400~1000		
Nickel Base, Wrought Incoloy Alloy 804, 825 Inconel Alloy 600, 601 Refractaloy 26	36~46	EH510/520	60~140	50~130	40~110		
		AC510U	80~180	60~150	50~140		
		AC520U	80~180	60~150	50~140		
		AC530U	70~150	50~140	50~120		
		WX2000	400~1500	400~1200	400~1000		
Nickel Base, Cast Hastalloy Alloy	36~46	EH510/520	60~130	40~120	30~100		
		AC510U	70~200	50~180	40~150		
		AC520U	70~170	50~150	40~130		
		AC530U	60~150	50~130	40~120		
		WX2000	400~1500	400~1200	400~1000		
	Chipbreaker Preference		EEF/ESU	EEG/EEX/EUP	EEG/EMU		

Technical
Guidance



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.
			CUTTING SPEED SFM		
HIGH TEMP ALLOYS IRON BASE, WROUGHT	180~230	EH510/520	100~180	90~170	80~140
		AC510U	120~220	100~200	80~180
		AC520U	120~220	100~200	80~180
		AC530U	80~150	80~120	70~100
		WX2000	400~1500	400~1200	400~1000
	250~320	EH510/520	100~170	80~150	65~125
		AC510U	120~210	90~190	75~160
		AC520U	120~210	90~190	75~160
		AC530U	80~180	80~160	50~120
		WX2000	400~1500	400~1200	400~1000
COBALT BASE		EH510/520	90~170	90~150	70~130
		AC510U	110~210	100~180	80~160
		AC520U	110~210	100~180	80~160
		AC530U	80~180	70~150	50~120
		WX2000	400~1500	400~1200	400~1000
STELLITE		EH510/520	100~170	90~155	70~120
		AC510U	110~200	100~170	80~150
		AC520U	110~200	100~170	80~150
		AC530U	80~180	80~150	50~120
		WX2000	300~1500	300~1200	300~1000
PURE TITANIUM		EH510/520	90~160	80~130	70~125
		AC510U	100~190	90~170	80~140
		AC520U	100~190	90~170	80~140
		AC530U	80~150	70~130	50~120
TITANIUM ALLOY Ti-6AL-4V		EH510/520	100~180	90~160	70~140
		AC510U	120~210	120~190	100~160
		AC520U	120~210	120~190	100~160
		AC530U	80~170	70~150	50~120
ALUMINUM ALLOYS BRASS ALLOYS		DA1000*	1000~10000	1000~10000	-
		DA2200*	1000~10000	1000~10000	-
		DA150*	1000~10000	1000~10000	-
		EH510/520	800~1700	700~1200	700~1000
		AC510U	500~1500	500~1200	500~1000
		AC520U	500~1500	500~1200	500~1000
		G10E	800~1500	700~1200	700~1000
	Chipbreaker Preference		EEF/ESU	EEG/EEX/EUP	EEG/EMU

* Refer to the PCD section for proper running conditions of PCD grades.



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .012 IPR .005" ~ .100" D.O.C.	Gen. Purpose .008 ~ .020 IPR .040" ~ .120" D.O.C.	Roughing .015 ~ .030 IPR .100" ~ .180" D.O.C.
CUTTING SPEED SFM					
COPPER ALLOYS WROUGHT 145, 147, 173, 187, 191, 314, 316, 330, 332, 335, 340, 342, 349, 350, 353, 356, 360, 365, 366, 367, 368, 370, 377, 385, 482, 485, 544, 623, 624, 638, 642, 782		DA1000*	2000~3300	2000~3300	–
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	–
		EH510/520	800~1300	800~1200	700~1100
		AC510U	1200~1700	1100~1500	900~1300
		AC520U	1200~1700	1100~1500	900~1300
		G10E	800~1100	800~1000	700~900
190, 226, 230, 240, 260, 268,270, 280, 425, 435, 442, 443, 444, 445, 464, 465, 466, 467,613, 618, 630, 632, 651, 655, 667, 675, 687, 694, 770		DA1000*	2000~3300	2000~3300	–
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	–
		EH510/520	800~1100	600~950	500~850
		AC510U	900~1300	800~1150	700~1000
		AC520U	900~1300	800~1150	700~1000
		G10E	800~900	600~750	500~650
411, 413, 505, 512, 511, 521, 524, 608, 610, 614, 619, 625, 674, 688, 706, 710, 715, 7285, 745		DA1000*	2000~3300	2000~3300	–
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	–
		EH510/520	250~550	200~500	150~450
		AC510U	450~750	350~650	300~600
		AC520U	450~750	350~650	300~600
		G10E	250~350	200~300	150~250
	Chipbreaker Preference	EEF/ESU	EEG/EEX/EUP	EEG/EMU	

* Refer to the PCD section for proper running conditions of PCD grades.



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.
			CUTTING SPEED SFM		
COPPER ALLOYS, CAST 834, 836, 938, 842, 844, 848, 852, 8545, 8955, 857, 858, 864, 867, 879, 928, 932, 934, 935, 937, 938, 939, 943, 944, 945, 953, 954, 956, 973, 974, 976, 078		DA1000*	2000~3300	2000~3300	-
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	-
		EH510/520	1000~1400	850~1250	750~1150
		AC510U	1200~1600	1050~1500	950~1400
		AC520U	1200~1600	1050~1500	950~1400
		G10E	1000~1200	850~1050	750~950
817, 821, 833, 853, 861, 862, 865, 888, 872, 874 ,875, 876, 878, 903, 905, 915, 9022, 923, 9059, 926, 927, 947, 948, 952, 955, 957, 958		DA1000*	2000~3300	2000~3300	-
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	-
		EH510/520	700~1100	550~850	500~800
		AC510U	950~1350	700~1100	650~1050
		AC520U	950~1350	700~1100	650~1050
		G10E	700~900	550~650	500~600
801, 803, 805, 807, 809, 811, 813, 814, 815, 818, 820 ,822, 824, 825, 826, 827, 828, 863, 902, 907, 909, 910, 911, 913, 916, 917, 962, 963, 964, 966, 993		DA1000*	2000~3300	2000~3300	-
		DA2200*	2000~3300	2000~3300	
		DA150*	2000~3300	2000~3300	-
		EH510/520	300~600	175~500	150~450
		AC510U	500~850	350~725	325~675
		AC520U	500~850	325~725	325~675
		G10E	300~400	175~300	150~250
GRAY CAST IRON		BN500*	600~2400	-	-
		BN700*	2000~6000	-	-
		BNS800*	2000~6000	-	-
		SN2000K	1000~3500	800~3500	800~2500
		T2000Z	600~1400	500~1200	-
		AC405K	700~1700	700~1500	600~1400
		AC410K	600~1600	500~1300	400~1000
		AC415K	600~1600	500~1300	400~1000
		AC420K	600~1500	500~1200	400~1000
		AC700G	-	400~1200	400~900
		AC820P	-	600~1000	500~900
		G10E	200~350	150~300	100~250
	Chipbreaker Preference		EEF/ESU	EEG/EEX/EUP	EEG/EMU

* Refer to the PCD section for proper running conditions of PCD grades.



Recommended first choice, Recommended second choice, Recommended third choice

Work Material	Hardness	Grade	Machining Parameters		
			Finishing .002 ~ .010 IPR .005" ~ .060" D.O.C.	Gen. Purpose .008 ~ .016 IPR .040" ~ .150" D.O.C.	Roughing .010 ~ .020 IPR 120~250" D.O.C.
	<220		CUTTING SPEED SFM		
GRAY CAST IRON cont.	>220	BN500*	600~2000	-	-
		BN700*	1900~3100	-	-
		BN800*	1900~3100	-	-
		SN2000K	1000~3500	800~3500	600~2500
		T1500Z	500~1350	400~1100	-
		AC405K	600~1600	600~1500	600~1400
		AC410K	550~1600	500~1200	450~1000
		AC415K	550~1600	500~1200	450~1000
		AC420K	500~1500	450~1100	400~1000
		AC700G	-	300~1200	400~1000
		AC820P	-	600~1000	500~900
		G10E	200~300	150~300	100~250
DUCTILE IRON NODULAR IRON	<220	BN500*	300~1000	-	-
		T1500Z	350~1000	400~950	-
		SN2000K	600~1700	600~1500	500~1100
		AC405K	600~1700	600~1500	600~1400
		AC410K	500~1500	500~1200	400~1000
		AC415K	500~1500	500~1200	400~1000
		AC420K	500~1400	500~1100	400~1000
		AC700G	-	500~1100	400~1000
		AC820P	-	600~950	600~900
	AC510U	500~800	400~750	350~600	
	>220	BN500*	300~900	-	-
		T1500Z	330~900	330~850	-
		SN2000K	500~1700	500~1500	400~1000
		AC405K	500~1700	500~1500	500~1100
		AC410K	400~1300	400~1100	300~1000
		AC415K	400~1300	400~1100	300~1000
		AC420K	400~1100	400~1000	300~900
		AC700G	-	400~900	300~800
		AC820P	-	500~900	450~850
AC510U	500~800	300~700	300~600		
	Chipbreaker Preference	ENZ/FLAT TOP	EGZ/FLAT TOP	EGZ/ FLAT TOP	

* Refer to the PCD section for proper running conditions of PCD grades.



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2NC-CCGT	153
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2NC-DCGA	155
2NC-DCGT	156
2NC-DNGA	143
2NC-DNGG	144
2NC-SNGA	146
2NC-VBGA	161
2NC-VCGA	162
2NC-VNGA	151
2NU-CCGA	153
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2NU-CPGA	154
2NU-DCGA	155
2NU-DCGT	156
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3NU-TPGA	159
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4NC-DNGA	143
4NC-DNGG	144
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